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Associations Between Perceived Teaching Behaviors and Affect in Upper Elementary School Students

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Abstract

We explored the associations between student-perceived teaching behaviors and negative affect (NA) and positive affect (PA) in upper elementary age students, both before and after controlling for perceived parenting behaviors. The Teaching Behavior Questionnaire (TBQ), the Alabama Parenting Questionnaire (APQ), and the Positive and Negative Affect Schedule for Children (PANAS-C) were completed by 777 third to fifth graders in nine elementary schools. Using two-level hierarchical linear model analyses, we found that (a) perceived instructional teaching behavior was negatively associated with NA and positively associated with PA; (b) perceived organizational behavior was not associated with either; (c) perceived socio-emotional teaching behavior was positively associated with both; (d) perceived negative teaching behavior was positively associated with NA but not associated with PA. When parenting behaviors were controlled for, the associations with NA but not with PA held up. We discuss implications of the findings for education and mental health personnel.

Keywords: elementary school, teaching behavior, positive affect, negative affect, parenting behavior

Depression is becoming the number one cause of disability in the United States (Mathers & Loncar, 2006), and much is known about its prevalence, treatment, and prevention. However, the majority of the literature emphasizes these areas in adulthood and adolescence, with clear gaps regarding childhood. For example, the Center for Disease Control and Prevention estimates that 4.3% of youth ages 12-17 have depression but fail even to track or report on children under the age of 12 (Pratt & Brody, 2008). Even when data exist about the prevalence, little is known about the predictors or what can be done to prevent it. In an attempt to fill this gap, in the current study, we explore the relationship between children's affect and their teachers' behaviors.

Research suggests that depressive disorders do exist in children as young as age three and that the prevalence rate for depression in preschoolers may be as high as 2% (Bufferd, Dougherty, Carlson, Rose, & Klein, 2012). In school-aged children, the prevalence rate increases significantly, particularly around ages 9-11 years, and up to 9% of youth experience a minimum of one depressive episode by the age of 14 (Abela & Hankin, 2008; Mash & Barkley, 2006). Further, childhood depression is associated with the risk of recurrence. Thus, depression in early adolescence can be predicted from data collected as early as third grade (Ward, Sylva, & Gresham, 2010). Childhood onset of depression also comes with a host of additional problems. For example, depression in minors is associated with decreased quality of life, serious emotional disturbances, and poor to severe functional impairment (Bertha & Balázs, 2013; Kessler et al., 2012). Adolescents with depressive symptoms have been shown to have higher suicidality, academic failure, delinquency, interpersonal distress, substance abuse, and unemployment (Klein, Torpey, & Bufferd, 2008; Patel, Flisher, Hetrick, & McGorry, 2007). Because depression clearly presents many problems by the age of adolescence, understanding influencing factors in upper elementary school students may be key in prevention efforts.

During elementary school years, 30-80% of depressed children also experience anxiety, suggesting significant comorbidity among anxiety and depression (Liu et al., 2006; Zalsman, Brent, & Weersing, 2006). To explain the relation between anxiety and depression, Watson and Clark developed the tripartite model of emotion (1991). The tripartite model posits a way to understand the specific components of anxiety and depression that differentiate them, as well as their overlapping features. Specifically, this model proposes three factors: negative affect (NA), positive affect (PA), and physiological hyperarousal (PH; Clark & Watson, 1991). High levels of NA are proposed to be a shared factor in both anxiety and depression (Chorpita & Daleiden, 2002). The absence of PA (anhedonia) is specific for depression, while PH is specific to anxiety (Clark & Watson, 1991; Chorpita & Daleiden, 2002). The tripartite model of emotion has been supported in research with clinical and non-clinical samples of adults, adolescents, and children (Chorpita & Daleiden, 2002; Clark & Watson, 1991; Joiner, Catanzaro, & Laurent, 1996; Lonigan, Carey, & Finch, 1994).

From a bioecological perspective of human development, one's interactions with their surrounding environment play an intricate role in growth and development. The model suggests that internal, individual systems, such as temperament, interact with a multilayered and changing environment to impact development (Bronfenbrenner & Morris, 2006). According to Bronfenbrenner, people, institutions, society, and cultural practices all influence and shape children. Specifically, Bronfenbrenner proposed five environmental systems in which interactions occur: microsystem (people), mesosystem (institutions), exosystem (society), macrosystem (cultural practices), and chronosystem (time). The microsystem refers to the most immediate and direct interactions in a child's life, with each system in the sequence becoming more broad and indirect. Thus, according to Bronfenbrenner, parents, primary caregivers, and

other adults, like teachers, that children interact with in their daily life have a great deal of influence in their growth and development. Therefore, when examining affect in children, it is important to consider interactions with these microsystem-level influences.

Parenting Behaviors

Research has found significant relationships between both positive and negative parenting behaviors and children's affect and depressive symptoms (Dallaire et al., 2006; Davidov & Grusec, 2006; Johnson & Greenberg, 2013; Oldehinkel, Veenstra, Ormel, de Winter, & Verhulst, 2006; Turner & Finkelhor, 1996). In particular, research has shown a relationship between parenting behavior and depressive symptoms, with factors like corporal (Turner & Finkelhor, 1996) and inconsistent punishment (Dittman et al., 2001) being linked to depression and poor monitoring and supervision being related to low positive affect (Johnson & Greenberg, 2013). Further, positive parenting is associated with lower levels of depression (Dallaire et al., 2006) and increased positive affect (Davidov & Grusec, 2006). Summarized, negative and positive parenting behaviors have a place in the conversation on depressive symptoms and affect in youth. The literature on parenting behaviors highlights how important environmental factors may be in contributing to the development of depressive symptoms in minors. Specifically, behaviors of adults directly involved in children's lives seem to have a significant impact in the emotional well-being of the child. The bioecological model, as well as research on parenting behaviors, leads to questions about the influence of behaviors from other adults that children interact with in their daily life, like teachers, as well.

Teaching Behaviors

Elementary-aged children spend more of their awake with teachers than with their parents. The influence of teachers on the course of a child's life is enormous and, in some cases, rivals even that of the child's parents (Harris & Rosenthal, 2005). Research has established that a

positive teacher-child relationship is important for the academic and behavioral success of a child in school (Baker, 2006; Hamre & Pianta, 2005) and contributes to both the academic and social-emotional development (Cole, Jacquez, & Maschman, 2001). Furthermore, children that form close and positive relationships with teachers enjoy school more, get along better with peers, are at decreased risk for school failure (Hamre & Pianta, 2005), feel more comfortable in their classroom, and tend to report better psychological adjustment (Furrer & Skinner, 2003; Van Ryzin, Gravely, & Roseth, 2009). Therefore, it is plausible to assume that these relationships are impacting children's affect, in addition to academic success. In fact, teacher's emotional support predicts lower levels of student's depression overtime, particularly when the student reports high numbers of stressful life events (Pössel, Rudasill, Sawyer, Spence, & Bjerg, 2013). Thus, it is important to investigate the mechanisms of these relationships, and break down what components of teaching behavior play a significant role in children's affect.

Literature suggests four components of teaching behaviors influence students' academic and social outcomes. (1) Instructional behavior is used by teachers to promote concepts, critical thinking, or skill development (Croninger & Valli, 2009; Pianta, LaParo, & Hamre, 2008). (2) Organizational behavior incorporates the methods established by the teacher to minimize disruptions, be efficient, and smooth transitions (Connor et al., 2009; Pianta et al., 2008). (3) Socio-emotional behavior shows how well the teacher relates to his/her student on a personal level and includes any behavior marked by supportiveness, warmth, or responsiveness. It may or may not be used during instructional time and encourages students' feelings of acceptance in the classroom (Connor et al., 2009; Pianta et al., 2008; Study 2, Pössel, Rudasill, Adelson, Bjerg, Wooldridge, & Winkeljohn Black, 2013). (4) Negative teaching behaviors are those considered unpleasant or counter-productive by the student (Study 2; Pössel, Rudasill, Adelson et al., 2013).

Studies designed to measure specific and concrete teaching behaviors as perceived by students found instructional teaching behavior to be negatively associated with NA and not associated with PA (Study 2, Pössel, Rudasill, Adelson et al., 2013) or depressive symptoms in high school students (Pittard, Pössel, & Smith, 2015). However, in middle school students it was negatively associated with depressive symptoms (Pittard et al., 2015). Using the tripartite model of emotion (Clark & Watson, 1991), this could indicate associations with both PA and NA at the middle school level. This pattern of findings could be suggesting that these associations are stronger in younger than in older children. However, as Pittard et al. (2015) measured depressive symptoms but not affect, it is not clear if that is true for PA and NA or only for one of them. Based on this consideration, we expected negative associations with NA and positive associations with PA in upper elementary school students.

Higher levels of organizational teaching behavior was associated with lower levels of NA but not associated with PA (Study 2, Pössel, Rudasill, Adelson et al., 2013) or depressive symptoms in high school students (Pittard et al., 2015). However, it was positively associated with depressive symptoms in middle school students (Pittard et al., 2015). Pittard et al. (2015) explain these seemingly inconsistent findings by proposing that high school students experience teaching behaviors such as explaining why misbehavior is wrong and explaining classroom rules differently than their younger counterparts. To be more precise, Pittard et al. (2015) propose that younger students interpret such teaching behavior as critique on themselves and resulting in a negative self-view, which is associated with depression (Alloy et al., 2012; Pittard et al., 2015). Following this interpretation and consistent with the tripartite model (Clark & Watson, 1991), we predicted a positive association of organizational teaching behavior with NA and a negative association with PA in upper elementary school students.

Socio-emotional teaching behavior was positively associated with both NA and PA in high school students (Study 2, Pössel, Rudasill, Adelson et al., 2013) and not associated with depressive symptoms in middle or high school students (Pittard et al., 2015). The positive associations with NA and PA can be interpreted as canceling one another out, therefore resulting in non-significant associations with depression, based on the tripartite model (Clark & Watson, 1991). Based on these prior findings, we expected that in upper elementary students the associations between socio-emotional behavior and NA and PA would remain consistent with the previous studies and both relationships would be positive.

Finally, negative teaching behavior was associated with less PA and more NA (Study 2; Pössel, Rudasill, Adelson et al., 2013) and positively related to depressive symptoms in high school students (Pittard et al., 2015). However, in middle school students no association with depressive symptoms was found (Pittard et al., 2015). One possible explanation is an opposite trend as in instructional behavior. In other words, the associations are weaker in younger than in older children. If this hypothesis is true, one could expect that the associations are even weaker in elementary school students. However, as stated above, Pittard et al. (2015) measured depressive symptoms but not affect. Thus, it is not clear if this is true for the association with PA and NA or for only one affect. We expected non-significant associations between negative teaching behavior and PA and NA in upper elementary school students.

Summarized, the goal of this study is to examine the relationship between teaching behaviors and the affect of upper elementary school students while controlling for parenting behaviors. We expected that all above described associations would remain significant when accounting for perceived parenting behaviors.

Method

Participants

We recruited participants from four school districts, two urban and two rural. Of the 2,193 students at the nine elementary schools, 777 (35%) had parent permission to participate in this study. Students were about evenly divided among grades 3 (35.5%), 4 (32.2%), and 5 (32.2%). Slightly more females (*N* = 443; 57%) than males (*N* = 334; 43%) participated. Self-reported races/ethnicities represented in the sample include Asian/Pacific-Islander (n = 27; 3.5%), Black (n = 137; 17.6%), Hispanic (n = 40; 5.1%), Native American/Alaskan (n = 13; 1.7%), Mixed (n = 159; 20.5%), White (n = 395; 50.8%), and Other (n = 3; .4%).

Measures

Teaching Behavior Questionnaire (TBQ). The TBQ (Pössel, Rudasill, Adelson et al., 2013) was developed to measure students' perceptions of concrete and specific teaching behaviors. It consists of 37 items measuring instructional (13 items; e.g., 'My teacher uses examples that I understand'), organizational (5 items, e.g., 'My teacher takes away a privilege if I abuse it'), socio-emotional (10 items, e.g., 'My teacher talks with me about my interests'), and negative teaching behaviors (9 items, e.g., 'My teacher threatens to punish me when I misbehave.´). Frequency of behavior is rated on a Likert scale ranging from 1 (never) to 4 (always). Item values are averaged, creating a score ranging from 1 to 4 for each scale. See Table 1 for the descriptive statistics and internal consistency scores for the TBQ scales.

This instrument had not been previously validated in elementary school students; therefore, we conducted a Confirmatory factor analysis, which demonstrated that the four-factor structure was the best fitting model in this elementary student sample, even though only RMSEA was in the acceptable range (χ^2 (623) = 1934.10, $p < .001$, RMSEA (.052), CFI (.794)).

Alabama Parenting Questionnaire (APQ). The APQ (Frick, 1991) is a 42-item student report instrument designed to tap the most important aspects of parenting practices. The items load onto six scales: Parental Monitoring and Supervision (10 items, e.g., 'Your parent gets so busy that they forget where you are and what you are doing.'), Inconsistent Punishment (6 items, e.g., 'Your parent does not punish you when you have done something wrong.'), Corporal Punishment (3 items, e.g., 'Your parent spanks you with their hand when you have done something wrong.') , Positive Parenting (6 items, e.g., 'Your parent praises you for behaving well.'), Involvement (10 items, e.g., 'Your parent helps you with your homework.'), and Other Discipline Practices (7 items, e.g., 'Your parent sends you to your room as a punishment.'). Students were asked to report on the parenting behavior of the adult they spend the most time with. Items are rated on a 5-point frequency scale ranging from 1 (never) to 5 (always) and are summed to produce each scale total. See Table 1 for the descriptive statistics and internal consistency scores for the APQ scales.

Positive Affect and Negative Affect Schedule for Children (PANAS-C). The PANAS-C (Laurent et al., 1999), a 30-item scale that measures affect in young children, was developed as a screening measure to differentiate children who are anxious from those who are depressed. Children indicate how often they have experienced certain "feelings and emotions" during the past few weeks, on a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). The items on the scale separate into two scales: Positive Affect (PANAS-PA, 15 items, e.g., 'Interested', 'Excited') and Negative Affect (PANAS-NA, 15 items, e.g., 'Sad', 'Scared'). Items on each scale are totaled to produce a sum PA and sum NA score. See Table 1 for the descriptive statistics and internal consistency scores for the PANAS scales.

Procedures

All elementary school principals in the selected school districts were invited to participate via email. In the schools whose principal chose to participate, only students whose parents returned a positive consent form were permitted to complete the questionnaire. Data were collected through questionnaires that were read out loud by the research team in the schools.

Statistical Analysis

In building the multi-level modeling of NA and PA, HLM Version 7.01 (Raudenbush, Bryk, Cheong, & Congdon, 2011) was used to conduct a series of analyses. HLM addresses the unit of analysis problem and enhances precision of estimates over methods that do not account for non-independence (McCoach & Adelson, 2010; Raudenbush & Bryk, 2002). Full information maximum likelihood (FIML) estimation methods were used, as recommended for robustness (Garson, 2013). Ten cases were lost due to listwise deletion. The analytic sample had 767 students at level 1 and 82 clusters at level 2 (M = 9.46; SD = 5.55; Range = 1-31).

There is a great amount of cognitive growth as well as increases in sustained attention during elementary school (Howe, 1993); therefore, we checked for significant differences in the grade levels prior to analyses. In the two two-level models, the regression weights were not statistically different, indicating that there were not statistically significant differences in PA (γ_{10} = 0.00, *SE* = 0.64, *p* = 1.00) or NA (γ_{10} = 0.25, *SE* = 0.67, *p* =.70) between grade levels.

For NA and PA, we conducted separate analyses using the following analytic approach. First, we estimated an unconditional two-level model to calculate the intra-class correlation (ICC). Then, because classrooms were nested within a small number of clusters (nine schools), we entered dummy codes for eight of the nine schools to account for school differences. To examine the hypotheses, we built three series of models (for each outcome) with varying predictors: TBQ only, APQ only, and TBQ and APQ combined. For the first model, we specified

a random coefficients model using the four TBQ scales [instructional (IB), organizational (OB), socio-emotional (SEB), and negative teaching behavior (NB)] as level-1 predictors, centered around the grand mean. Initially, all TBQ scales were specified as randomly varying, but non-significant random effects were fixed one at a time. For the second model, we specified a random coefficients model using the APQ scales [parental monitoring and supervision (PMS), inconsistent punishment (IP), corporal punishment (CP), positive parenting (PP), involvement (INV), and other discipline (OD)], centered around the grand mean, as level-1 predictors, following the same process for determining randomly-varying slopes. For the final model, which tested the TBQ associations after controlling for parenting, we entered the TBQ scales as level-1 predictors in the APQ model and trimmed non-significant random effects.

Using the models we computed four different proportions of variance explained (PVE) for each outcome: the PVE by TBQ only, the PVE by APQ only, the PVE explained by TBQ and APQ combined, and the PVE by TBQ above and beyond what APQ explained. For the first three calculations, we compared the model to the baseline model. For the fourth calculation, we compared the model with TBQ and APQ with the model with only APQ.

Results

Baseline PANAS-NA Model

The null model resulting in an ICC of .07. This indicates that 93% of variance in NA was between students within classrooms and 7% was between classrooms. The eight school dummy codes were added to this model to serve as a baseline model.

The Relationship between TBQ and PANAS-NA

Next, we specified a random coefficients model using the four TBQ scales as level-1 predictors and NA as the outcome. Only the relationship of the NB scale with NA randomly varied across classrooms (Table 2).

Of particular interest in this model were the relationships of the perceived teaching behaviors and NA, after controlling for school. The relationship between IB and NA was significant (γ_{10} = -4.42, $p < .001$) indicating that for every 1-unit increase in perceived instructional behavior, NA decreases by 4.42 points. The relationship between NB and NA was positive and significant (γ_{20} = 4.39, $p < .001$), suggesting that as perceived negative teaching behavior increases, NA in students also increases. Additionally, SEB was positively and significantly related to NA (γ_{30} = 2.57, $p = .001$). Finally, OB was not found to be significantly related to NA (γ_{40} = -1.37 $p = .08$), after controlling for other teaching behaviors and school.

Compared to the baseline model, teaching behaviors accounted for 12.26% of the variance in NA within classrooms and 66.50% of the variance between classrooms. In contrast, we also ran a model with the APQ only to compare this to the proportion of variance that parenting behaviors account for in NA. The APQ did explain 31.49% of within-class variability; however, it did not explain any variability between classes.

The Relationship between TBQ and PANAS-NA, After Controlling for Parenting Behaviors

We specified a random coefficients model predicting NA by first entering the APQ scales (trimming non-significant random effects) and then entering the TBQ scales (trimming non-significant random effects). Parameters and random effects of the final TBQ and APQ model can be seen in Table 2. Of particular interest are the relationships between NA and the TBQ scales,

which were in the same direction and had the same statistical significance as prior to controlling for perceived parenting behaviors.

Perceived parenting and teaching behaviors together accounted for 42.71% of the variance in NA within classrooms. Compared to the model with TBQ only, no additional variance was explained between classrooms as the addition of the APQ increased the between-classroom variability. This provides incremental validity evidence for the TBQ as it explained an additional 11.22% of the within-classroom variance in NA over the APQ alone. Further, although the APQ did not explain any between-class variability in NA, the TBQ did.

Baseline PANAS-PA Model

Similar to the NA model, the null PA model resulted in an ICC of .08, indicating that 8% of variance was between classrooms and the majority was between students within classrooms. The baseline model was built by adding the eight school dummy codes.

The Relationship between TBQ and PANAS-PA

Next, a random coefficients model was specified using the four TBQ scales as level-1 predictors and PA as the outcome. None of the slopes randomly varied across classrooms, only the intercept (Table 2).

The average PA score across classes for a student with average teaching behaviors scores, after controlling for school, is statistically different from zero ($\gamma_{00} = 57.12$, $p < .001$). The relationship between IB and PA, after controlling for other perceived teaching behaviors and school, is positive and significant ($\gamma_{10} = 2.50$, $p = .01$), indicating that for every 1-unit increase in IB, PA increases by 2.50 points. Additionally, for every 1-unit increase in SEB, PA is expected to increase by 2.02 points ($\gamma_{30} = 2.02$, $p = .01$). However, the relationship between NB and PA

and between OB and PA were not found to be significant ($\gamma_{20} = 0.48$, $p = .55$ and $\gamma_{40} = 1.18$, $p = .10$, respectively), after controlling for other teaching behaviors and school.

Teaching behaviors accounted for 4.58% of the variance in PA within classrooms and 31.26% of the variance between classrooms. In contrast, we also ran a model with the APQ only to compare this to the proportion of variance that parenting behaviors account for in PA, which was 12.32% within classes and 55.17% between classrooms.

The Relationship between TBQ and PANAS-PA, After Controlling for Parenting Behaviors

We specified a random coefficients model using the APQ scales as predictors and PA as the outcome, and then we added the TBQ scales to the model. None of the TBQ or APQ scale slopes randomly varied across classrooms (Table 2). Of particular interest are the relationships between NA and the TBQ scales. Once we controlled for perceived parenting behaviors, none of the perceived teaching behaviors had a statistically significant relationship with NA.

Parenting and teaching behaviors together account for 13.06% of the variance in PA within classrooms and 80.23% of the variance between classrooms. Although the individual scales were no longer significantly related to NA, examining the PVE provides incremental validity evidence for the TBQ, above and beyond the APQ. Although adding the TBQ to the APQ model only explained an additional 0.74% variability within classes, it explained an additional 25.06% of variability between classes.

Discussion

We examined the associations between student perceptions of teaching behaviors and affect in a large school-based sample of upper elementary school students. We hypothesized that perceived instructional teaching behavior would be negatively associated NA, while

organizational and socio-emotional teaching behaviors would be positively associated and negative teaching behavior would not be significantly associated with NA. Furthermore, we expected that perceived instructional and socio-emotional teaching behaviors would be positively associated with PA, while organizational teaching behavior would be negatively associated and negative teaching behavior would not be significantly associated with PA. Finally, we also hypothesized the outlined associations would not change after controlling for perceived parenting behaviors. Several findings stand out, some confirming hypotheses based on previous observations and some novel.

Teaching Behaviors and Children's Affect

As predicted, we found that perceived instructional teaching behavior was negatively associated with NA and positively associated with PA. Thus, students' perceptions of their teacher using behaviors such as staying on task, using examples they understand, and having fair rules for classroom behavior is associated with higher PA and lower NA in upper elementary school students. We predicted this pattern of findings based on the idea that the associations between perceived instructional teaching behavior and affect are stronger in younger students. Although the present study seems to support this idea, possible reasons for this trend are unclear. Nevertheless, one relatively obvious hypothesis is that instructional teaching behavior might be more diverse in elementary schools compared to middle or high schools. Restricted variability limits the observed correlations between variables (Urbina, 2014), which might cause students' perception of instructional teaching behavior to be more strongly associated with students' affect in elementary school compared to in middle and high school. However, this hypothesis does not seem to be supported by the variability in the TBQ IS scale in middle (*SD* = 1.10; Pittard et al., 2015) and high school students (*SD* = 0.62-0.92; Pittard et al., 2015; Pössel, Rudasill, Adelson et

al., 2013) compared to our elementary school students (*SD* = 0.56). Thus, additional mechanisms underlying this trend need to be explored in future studies.

Another set of findings consistent with our hypotheses and previous findings (Pittard et al., 2015; Pössel, Rudasill, Adelson et al., 2013) were the positive associations between perceived socio-emotional teaching behavior with both PA and NA. Pössel, Rudasill, Adelson et al. (2013) propose that socio-emotional teaching behavior indeed has a positive association with PA but that the positive association with NA is caused by the cross-sectional design of the study. To be more precise, students with high NA seek socio-emotional support from their teachers and may be more attuned to it. However, previous research has shown iatrogenic effects of emotional support from teachers on some students (Pössel, Rudasill, Sawyer et al., 2013). Pössel, Rudasill, Sawyer et al. (2013) hypothesize that this iatrogenic effect might be explainable by the *deviancy training hypothesis*, such that students are role models for each other, learning to attend to or describe NA. Regarding our findings, this could mean that socio-emotional teaching behavior provides a safe space for such learning as it allows students to express their NA. In other words, socio-emotional teaching behavior seems to be positively associated with NA because students exposed to more socio-emotional teaching behavior feel save to express their NA. However, to test this hypothesis a multi-wave study focusing on the directionality of the associations between teaching behavior and students' affect is needed.

The null findings regarding perceived organizational teaching behavior with both NA and PA are not consistent with our hypotheses and previous findings (Pittard et al., 2015; Pössel, Rudasill, Adelson et al., 2013). These null findings might be explainable by the low internal consistency of the TBQ scale OB in our sample ($\alpha = .57$). Although lower internal consistencies in younger students is not untypical (e.g., Fredricks & Eccles, 2002), this will be a challenge for

future studies, and the relationship between perceived organizational teaching behavior and affect should continue to be explored across grades.

Consistent with our hypothesis, perceived negative teaching behavior was not significantly associated with PA but contrary to our prediction it was positively associated with NA in this sample. This means that when elementary school students perceive their teacher as exhibiting unpleasant or counter-productive teaching behaviors, they are more likely to report high NA but not PA. Summarizing the literature, perceived negative teaching behavior is associated with NA in high (Pössel, Rudasill, Adelson et al., 2013) and elementary school, so it is unlikely that these associations weaken in younger students as we predicted. Previously found null associations of negative teaching behavior with depressive symptoms in middle school students (Pittard et al., 2015) could be hiding an association with NA that went undetected when measuring depression. However the literature to perceived negative teaching behavior and PA in high (Pössel, Rudasill, Adelson et al., 2013) and elementary school supports our prediction that this association grows stronger over time. Similar to students' perception of instructional teaching behavior, one might speculate that elementary teachers show less inconsistent and threatening teaching behavior than middle and high school teachers, which could limit the variability in the TBQ NTB scale in our elementary school sample. However, numerically the variability in the TBQ IS scale in middle (*SD* = 0.86; Pittard et al., 2015) and high school students (*SD* = 0.65-0.73; Pittard et al., 2015; Pössel, Rudasill, Adelson et al., 2013) compared to our elementary school students (*SD* = 0.56) seems very similar, which does not support this hypothesis. Thus, like with instructional teaching behavior, other mechanisms underlying this trend need to be explored in future studies.

Teaching Behaviors and Children's Affect, After Controlling for Parenting

After perceived parenting behaviors were controlled for, some associations between perceived teaching behaviors and student's affect remained significant while others did not. In particular, all associations between perceived teaching behaviors (instructional, socio-emotional, negative) and NA that were significant without controlling for perceived parenting behavior remained significant after controlling for perceived parenting behavior. Additionally, the strengths of associations between perceived teaching behaviors and NA remains largely unchanged by adding perceived parenting behavior. Furthermore, perceived teaching behaviors did account for unique variances in NA, above and beyond parenting behaviors. This pattern of association demonstrates that teachers and parents are both important and independent in their associations with NA in elementary students. However, that also means that they cannot compensate for each other in case one group of adults has a negative impact on elementary students' NA. In other words, students perceiving teaching behaviors as negative will experience higher NA than those who perceive teaching behaviors as positive, regardless of the perceived parenting behaviors that are occurring in their homes.

After controlling for perceived parenting behaviors, there were no longer any significant associations between perceived teaching behaviors and PA in this elementary school sample. That being said, similar to the NA model, in the PA model, perceived teaching behaviors did account for unique variance between classrooms, above and beyond perceived parenting behaviors. Thus, although more research into this is needed, it seems that teachers and parents explain unique variances in PA and cannot compensate for each other's behaviors.

Overall, perceived teaching behaviors do help explain variance in both NA and PA for elementary school students. In fact, they explain unique variance in affect both within and between classrooms. Perceived teaching behaviors alone explained significant variance between

classes (66.50% of NA and 31.26% of PA). Interesting, perceived teaching behaviors also help explain variance within classrooms for NA (12.26%) and PA (4.58%), even with students rating the same teachers. This finding suggests that students' perceptions of teaching behavior of the same teacher varies widely and is related to the students' affect. This can be interpreted as evidence that teachers adapt their behavior to accommodate the needs of individual students.

This study also helps provide incremental validity for the TBQ. Specifically, perceived teaching behaviors predict the variance in NA above and beyond perceived parenting behaviors. For NA, the TBQ explains an additional 11.22% within-class variance above and beyond perceived parenting behaviors. However, we did not find significant within-classroom incremental validity for PA, with perceived teaching behaviors explaining only 0.74% of within-class variance above and beyond perceived parenting behaviors. Overall, the patterns in proportion of variance explained in NA and PA by perceived teaching behavior remain unclear and warrant further investigation in replication studies. However, these findings do support continued use of the TBQ in helping predict affect in students, above and beyond the APQ.

The findings to the influence of accounting for the effects of perceived parenting behavior when examining associations between perceived teaching behaviors and PA and NA in elementary students have important implications from a bioecological and intervention perspective. Although further exploration of these associations are necessary, these preliminary findings imply that perceived parenting behaviors may have such a large influence on PA in youth that perceived teaching behaviors do not differentiate how students in the same classrooms experience PA. However, when considering children's NA, their teacher's does seem to contribute above and beyond perceived parents' behaviors, differentiating the NA of students within the same classrooms and in different classrooms. Future research should consider

dismantling the associations between PA and specific perceived parenting and teaching behaviors to explore underlying interactions that may exist.

Limitations

A limitation of this study is its cross-sectional design. The design does not allow for conclusions about the temporal directionality or even the causality of the associations between perceived teaching behaviors and affect. Thus, multi-wave and experimental studies manipulating teaching behaviors are needed.

Additionally, the sole use of student reports could be seen as a limitation of the current study. Particularly as common method variance can result when the same person provides information on all variables (e.g., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Therefore, future studies should make use of multiple sources of information (e.g., teacher or observations to measure teaching behavior). However, it needs to be considered that while observations of teaching behavior are seen as the gold standard, they are time consuming and expensive (Douglas, 2009)..Further, multiple studies demonstrate that student reports of teaching behavior are more valuable than reports from other sources (Eccles et al., 1993; Pössel, Rudasill, Adelson, et al, 2013; Wubbels & Levy, 1991). Further, teacher reports of teaching behavior may not be the most reliable due to positive impression management or lack of insight (Douglas, 2009).

It is notable that there may be some limitations regarding the generalizability of the findings due to sampling biases. All students in third-fifth grades took home parent consent forms explaining the study, but our sample was limited to students' whose parents agreed to let their child participate. The process of obtaining parental consent in this way assumes that parents are involved and attuned to the child's academic needs and what is coming home with them from the school. Thus, the process of obtaining parental consent potentially excluded children that receive less parental involvement, creating a bias towards children with more involved parents.

Additionally, the consent form described that students would be asked about "parenting behaviors". Although there is no evidence to support the claim, it is reasonable to expect that some parents would be unwilling to let their child participate because they did not want potentially negative parenting behaviors reported (e.g. 'The punishment your parent(s) give depends on their mood', 'Your parent(s) yell or scream at you when you have done something wrong). As a result, our sample may have contained children with fewer negative parenting behaviors reported. These factors may have all contributed in limiting the variance in parenting behaviors in our sample, thus impacting the findings of the associations between teaching behaviors and children's affect after controlling for parenting behavior.

There are also limitations with the measure used for collecting student-ratings of teaching behaviors. The internal consistencies of all of the TBQ scales were not adequate. Specifically, negative teaching behavior ($\alpha = .67$) and organizational behavior ($\alpha = .57$) were both below the commonly recommended cutoff score of .70 (Nunnally, 1978). These scales may not reliably measure the intended constructs in elementary school students, which limits the ability to detect associations. Finally, the goodness of fit indices TLI and CFI for the TBQ demonstrated that the four factor model does not fit the data well. However, Hu and Bentler (1998) suggest that goodness of fit indices are better at distinguishing between models that have different degrees of misspecification than providing absolute guidelines about the acceptability of a particular model. Thus, Marsh, Hau, and Wen's (2004) recommended using the indices to compare the fit of models rather than as absolute cutoff values and the four factor model was the best fitting model, when compared to a one and three factor model. Nevertheless, future research should further explore alternative factor structures in elementary school students.

Implications

The current findings have implications for teacher training and the prevention of depression and NA in children. Though some associations need to be further parsed out across the school years, there have been some consistent associations between teaching behavior and children's affect from elementary to high school. This study, and its middle and high school counterparts (Pittard et al., 2015; Pössel, Rudasill, Adelson et al., 2013), highlight how students perceive instructional and negative teaching behaviors relate to the emotional well-being of students. The current study provides observable and measurable behaviors that teachers should be aware of when interacting with their students.

Mental health professionals working with depressed youth should be encouraged to assess and intervene not only at the parent level but also at the teacher level, when warranted. Teacher training could highlight specifically instructional and negative teaching behaviors that were associated with depression and NA across multiple samples (Pittard et al., 2015; Pössel, Rudasill, Adelson et al., 2013) to attempt to target and change the frequency of these teaching behaviors. It is also necessary to consider the importance of student perceptions of the teaching behaviors when developing training programs. Teacher training should help teachers understand how their own behaviors can be perceived differently across students. Behaviors perceived as supportive and warm by one student may be perceived as unpleasant and counter-productive by another. Thus, teachers should be aware that building relationships with students individually will shape the way their behaviors are perceived.

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Table 1

Descriptive Data, Internal Consistency, and Correlations

	IB	NB	SEB	OB	INV	PP	PMS	IP	CP	OD	PA	NA
IB	.86											
NB	-.31**	.67										
SEB	.56**	-.03	.77									
OB	.36**	.18**	.35**	.57								
INV	.20**	.06	.23**	.23**	.77							
PP	.18**	.08*	.25**	.22**	.71**	.80						
PMS	-.25**	.30**	-.02	-.03	-.07*	-.07	.79					
IP	-.11**	.27**	.05	.02	.04	.04	.54**	.63				
CP	-.17**	.19**	-.07	-.01	-.14**	-.14**	.30**	.27**	.71			
OD	-.04	.21**	.11**	.17**	.18**	.17**	.25**	.31**	.46**	.58		
PA	.24**	-.00	.22**	.17**	.31**	.37**	-.10**	.00	-.07	.09*	.85	
NA	-.23**	.27**	-.02	-.07	-.10**	-.12**	.26**	.21**	.25**	.20**	-.15**	.88
Mean	3.20	2.00	2.53	3.20	36.73	23.88	12.02	14.28	5.65	17.83	55.56	28.11

SD	0.56	0.56	0.62	0.63	7.25	5.14	0.81	4.91	3.11	5.16	11.55	11.43
Range	1-4	1-4	1-4	1-4	10-50	6-30	11-15	6-30	3-15	7-35	15-75	15-71

Note. N = 767. Internal consistencies are presented in the diagonal. IB = Teaching Behavior Questionnaire (TBQ), Instructional Behavior; NB = TBQ, Negative Teaching Behavior; SEB = TBQ, Socio-Emotional Behavior; OB = TBQ, Organizational Behavior; INV = Alabama Parenting Questionnaire (APQ), Involvement; PP = APQ, Positive Parenting; PMS = APQ, Parental Monitoring and Supervision; IP = APQ, Inconsistent Punishment; CP = APQ, Corporal Punishment; OD = APQ, Other Discipline; PA = Positive and Negative Affect Schedule for Children (PANAS-C), Positive Affect; NA = PANAS-C, Negative Affect. ** $p < .001$; * $p < .05$.

Table 2

Parameter Estimates of Negative and Positive Affect in the Perceived Teaching Behaviors Models with and without Perceived Parenting Behaviors (APQ) in the Models

	Negative affect models		Positive affect models	
Fixed effects	Parameter est. (SE) without APQ	Parameter est. (SE) with APQ	Parameter est. (SE) without APQ	Parameter est. (SE) with APQ
Intercept (γ_{00})	30.80 (1.36)***	29.86 (1.27)***	57.12 (1.47)***	56.51 (1.30)***
Instructional beh. (γ_{10})	-4.42 (0.96)***	-2.43 (0.90)**	2.50 (0.99)*	1.80 (0.95)
Negative teaching beh. (γ_{20})	-4.40 (0.91)***	3.07 (0.88)***	0.48 (0.81)	0.04 (0.79)
Socio-emotional beh. (γ_{30})	2.57 (0.78)**	2.53 (0.74)***	2.02 (0.81)*	0.94 (0.78)
Organizational beh. (γ_{40})	-01.37 (0.70)	-0.89(0.81)	1.18 (0.72)	0.35 (0.70)
Parenting involvement (γ_{50})		-0.003 (0.09)		0.08 (0.08)
Positive parenting (γ_{60})		-0.32 (0.12)**		0.60 (0.11)***
Poor monitoring & supervision (γ_{70})		1.55 (0.63)*		-1.27 (0.59)*
Inconsistent punishment (γ_{80})		0.13 (0.11)		0.07 (0.09)
Corporal punishment (γ_{90})		0.44 (0.13)**		0.03 (0.15)
Other discipline (γ_{100})		0.18 (0.11)		0.07 (0.09)
Variance components				

Classroom mean (τ_{00})	1.38*	4.64***	2.99**	0.86
Negative teaching beh. slope (τ_{22})	11.53*	12.99*		
Organizational beh. slope (τ_{44})		14.86*		
Parenting involvement slope (τ_{55})		0.17*		
Positive parenting slope (τ_{66})		0.26*		
Poor monitoring & supervision slope (τ_{77})		6.07*		
Inconsistent punishment slope (τ_{88})		0.22**		
Other discipline slope (τ_{1010})		0.33**		
Within classrooms (σ^2)	107.29	70.05	116.13	105.80

Note. This model controlled for school using nine dummy codes at level-2 predicting the intercepts, but these parameters are omitted for space. * $p < .05$. ** $p < .01$. *** $p < .001$.