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# Elementary preservice teachers' attitudes and pedagogical strategies toward hypothetical shy, exuberant, and average children

Qizhen Deng

University of Nebraska-Lincoln, qizhendeng@boisestate.edu

Guy Trainin

University of Nebraska-Lincoln, gtrainin2@unl.edu

Kathleen Moritz Rudasill

University of Nebraska - Lincoln, kmrudasill@vcu.edu

Irina Kalutskaya

University of Nebraska-Lincoln, irina@huskers.unl.edu

Stephanie Wessels

University of Nebraska-Lincoln, swessels2@unl.edu

See next page for additional authors

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**Authors**

Qizhen Deng, Guy Trainin, Kathleen Moritz Rudasill, Irina Kalutskaya, Stephanie Wessels, Julia C. Torquati, and Robert J. Coplan

# Elementary preservice teachers' attitudes and pedagogical strategies toward hypothetical shy, exuberant, and average children

Qizhen Deng,<sup>1</sup> Guy Trainin,<sup>2</sup> Kathleen Rudasill,<sup>3</sup> Irina Kalutskaya,<sup>4</sup>  
Stephanie Wessels,<sup>5</sup> Julia Torquati,<sup>6</sup> and Robert J. Coplan<sup>7</sup>

<sup>1</sup> Nebraska Research Center for Children, Youth, Families and Schools, University of Nebraska–Lincoln, Whittier 162G, Lincoln, NE 68588

<sup>2</sup> Department of Teaching, Learning, and Teacher Education, University of Nebraska–Lincoln, Henzlik Hall 44A, Lincoln, NE 68588-0355

<sup>3</sup> Department of Educational Psychology, University of Nebraska–Lincoln, Teachers College Hall 221, Lincoln, NE 68588-0345

<sup>4</sup> Department of Educational Psychology, University of Nebraska–Lincoln, Teachers College Hall 114, Lincoln, NE 68588-0345

<sup>5</sup> Department of Teaching, Learning, and Teacher Education, University of Nebraska–Lincoln, Henzlik Hall 61C, Lincoln, NE 68588-0355

<sup>6</sup> Department of Child, Youth and Family Studies, University of Nebraska–Lincoln, Mable Lee Hall 247, Lincoln, NE 68588-0236

<sup>7</sup> Department of Psychology, Carleton University, 1125 Colonel By Drive, Ottawa, ON K1S5B6, Canada

*Corresponding author* — Q. Deng

*E-mail addresses:* qdeng@unl.edu (Q. Deng); gtrainin2@unl.edu (G. Trainin); krudasill2@unl.edu (K. Rudasill); irina@huskers.unl.edu (I. Kalutskaya); swessels2@unl.edu (S. Wessels); jtorquati@unl.edu (J. Torquati); robert\_coplan@carleton.ca (R.J. Coplan)

## Abstract

Children's learning and development are directly and indirectly influenced by teachers' beliefs and pedagogical strategies toward child behaviors. This cross-sectional study explored elementary preservice teachers' attitudes and pedagogical strategies for working with hypothetical children demonstrating temperament-based shy, exuberant, and average behaviors in the classroom. A secondary goal was to compare attitudes and pedagogical strategies at the beginning and end of teacher training program. A total of 354 participants responded to three vignettes describing children frequently displaying these behaviors. Results indicated preservice teachers were more likely to use social-learning strategies with shy children and high-powered strategies with exuberant children. Participants were more likely to show warmth to shy children, but believed they would be less academically successful. Participants at the end of the program reported higher self-efficacy and more warmth toward all children compared to those beginning the program. Results are discussed in terms of their educational implications.

**Keywords:** Child temperament, Shyness, Exuberance, Preservice teachers, Attitudes, Pedagogical strategies

## 1. Introduction

A primary goal of elementary teacher education is to prepare preservice teachers to work effectively with diverse children in the classroom. Preservice teachers are undergraduate students who seek to become teachers through formal teacher education programs, where they experience a combination of content courses, pedagogy courses, and field experience. Teachers' attitudes and pedagogical strategies to support or discourage specific child behaviors directly and indirectly influence children's developmental outcomes. For instance, teacher beliefs about child development influence their responses to children's behaviors (Arbeau & Coplan, 2007; Cunningham & Sugawara, 1989), classroom practices (Fang, 1996; Trivette, Dunst, Hamby, & Meter, 2012; Vartuli, 1999; Wen, Elicker, & McMullen, 2011), and relationships with children (Rudasill & Rimm-Kaufman, 2009; Thijs, Koomen, & Van Der Leij, 2008). Teacher beliefs about children's behaviors also contribute to children's relationships with peers, self-regulation, school adjustment, and academic per-

formance (Birch & Ladd, 1998; Pianta, Steinberg, & Rollins, 1995). Teachers need to understand the complexity of child development to make pedagogical decisions in light of student needs and to support different social, emotional, and cognitive developmental pathways (Horowitz et al., 2005; Rudasill & Rimm-Kaufman, 2009). In this study, we focused on one such pathway—elementary preservice teachers' understanding of and response to individual differences in child temperament. Specifically, this cross-sectional study examined preservice teachers' attitudes (i.e., teacher warmth, teacher self-efficacy, and teacher-perceived child academic skills) and pedagogical strategies (i.e., high-powered strategies vs. social-learning strategies) toward hypothetical children displaying shy (i.e., inhibited and low-reactive, quiet), exuberant (i.e., uninhibited and high-reactive, overly talkative), or average (i.e., not inhibited/shy or uninhibited/exuberant, typical) behaviors in the classroom (e.g., Arbeau & Coplan, 2007; Coplan, Hastings, Lagacé-Séguin, & Moulton, 2002; Coplan, Hughes, Bosacki, & Rose-Krasnor, 2011; Fox, Henderson, Rubin, Calkins, & Schmidt, 2001; Hastings & Rubin, 1999; Kagan, 2012;

Rubin, Coplan, & Bowker, 2009). A secondary goal was to see how these attitudes and pedagogical strategies differed between preservice teachers at the beginning compared to the end of their training program.

There is limited research on preservice teachers' attitudes and pedagogical strategies toward children with different temperament-based behaviors. The only empirical studies on this topic have focused on in-service teachers (e.g., Arbeau & Coplan, 2007; Coplan et al., 2011). We need to understand whether preservice teachers respond to students in developmentally supportive ways to inform teacher education. Teacher attitudes and pedagogical strategies are influenced by earlier life experiences and professional training, including content and pedagogical courses as well as internships (Keys, 2007; Pajares, 1992). Thus, this study can potentially inform elementary teacher preparation and professional development by focusing on preservice teachers' understanding of temperamental differences among children in order to promote success for both teachers and students. To examine preservice teachers' attitudes and pedagogical strategies, we presented three hypothetical vignettes (Coplan et al., 2011) describing elementary school boys who display shyness, exuberance, or average behaviors in the classroom (see Appendix). Following each vignette, participants rated their attitudes and the likelihood of using various pedagogical strategies working with children displaying these behaviors.

## 2. Literature review

### 2.1. Child temperament-based behavior style

Children vary in the ways in which they behave in classroom environments, engage in class activities, follow directions, and interact with peers and teachers. These differences are based in part on children's temperament, defined as biologically based individual differences in reactivity and regulation in responses to novel stimuli (e.g., people, events) in the environment (Rothbart & Bates, 2006). Behavioral inhibition as a temperament construct refers to "a behavioral profile in children that is observed soon after the first birthday and is marked by avoidance and timidity in response to unfamiliar people, events, and objects" (Kagan, 2012, p.79). Specifically, individuals differ in their thresholds of arousal; those who have a low threshold are very easily aroused, and are highly reactive. Research evidence suggests that highly reactive individuals have very easily excited amygdalas that tend to "overreact to unexpected or unfamiliar events" (Kagan, 2012, p. 71). Such high-reactive individuals are more likely to display inhibited, shy behaviors, such as avoiding eye contact and engaging in limited or quiet speech in social situations (Kagan, 2012; Kalutskaya, Archbell, Moritz Rudasill, & Coplan, 2015). On the other hand, low-reactive individuals have a high threshold for arousal. Low-reactive individuals are uninhibited and exuberant; they do not display social fear and tend to engage in spontaneous speech with unfamiliar people (Kagan & Fox, 2006). Many children are neither shy nor exuberant. Approximately 15–20% of the population is highly reactive or shy, 30–35% is low-reactive or exuberant, and 45–55% is moderately reactive or average (Kagan, Snidman, & Arcus, 1998). The complexity of child temperament has important implications for children's behaviors and engagement in the classroom environment.

The environments of typical elementary classrooms require children to respond and adapt to multiple social (e.g., work with peers), academic (e.g., focus on an assignment), and behavioral (e.g., sit still during teacher-directed instruction) demands (Carter & Doyle, 2006). Children's temperament characteristics may account for their inappropriate, excessive, and/or unexpected responses to the school environment (e.g., Thomas & Chess, 1977). Shy and exuberant behavior has significant implications for children's abilities to optimally engage in the elementary classroom (Kagan et al., 1998). Because shy children tend to withdraw from novel stimuli (e.g., a new

teacher) and social situations (e.g., initiating interactions with peers) (Coplan & Rubin, 2010), they may have limited opportunities to interact and engage with teachers and peers in the classroom (Rudasill, Rimm-Kaufman, Justice, & Pence, 2006). On the other hand, a very exuberant child is more likely to approach novel and social situations, but is also prone to engage in behavior that is disruptive to classroom activities such as calling out answers or interrupting teacher instruction (Rimm-Kaufman & Kagan, 2005). Shy and exuberant children display behaviors that can be considered poorly regulated because such children cannot flexibly adapt their behaviors to match the situational demands (Eisenberg, Shepard, Fabes, Murphy, & Guthrie, 1998; Rudasill & Rimm-Kaufman, 2009). That is, the shy child is *over-regulated* and the exuberant child is *under-regulated*, and both types of children require support from adults to manage their behavior in ways that allow them to obtain maximum benefit from experiences in school.

### 2.2. Teacher attitudes

#### 2.2.1. Teacher warmth

Research on student perceptions has shown that students tend to appreciate warm and sympathetic teachers who establish caring relationships with their students (Mainhard, Brekelmans, & Wubbels, 2011). Teachers' warmth and support is positively associated with students' sense of belonging and engagement (Freeman, Anderman, & Jensen, 2007), inversely associated with student tension (Torok, McMorris, & Lin, 2004), and can be a protective factor for students' academic success, particularly for those who exhibit behavioral (e.g., Hamre & Pianta, 2005) or temperamental (e.g., Curby, Rudasill, Edwards, & Pérez-Edgar, 2011) risk. For example, Hamre and Pianta (2005) found that first grade children at risk for academic difficulties because of poor attention and behavior performed just as well on standardized tests of academic performance as their peers with no risk when they were in classrooms marked by high levels of teacher warmth and sensitivity. In a longitudinal study, Hamre and Pianta (2001) reported that relational negativity with teachers in kindergarten was associated with diminished academic and emotional outcomes as late as 8th grade. Similarly, Arbeau, Coplan, and Weeks (2010) found that associations between 1st grade children's shyness (at the beginning of the school year) and socio-emotional adjustment (at the end of the school year) were moderated by teacher-child relationships, with shyness and negative teacher-child relationships (i.e., dependent, conflictual) related to social-emotional difficulties, whereas close teacher-child relationships (i.e., warm, supportive) related to positive adjustment. Arbeau et al. (2010) further suggested a protective role (i.e., buffering process) for close teacher-child relationships in shy children's socio-emotional adjustment. In general, teachers' warmth and sympathetic attitudes contribute to a positive classroom social climate (Woolfolk-Hoy & Weinstein, 2006), help children successfully adjust to school (Arbeau et al., 2010), and enhance student academic interest (Hidi, 2006) and subsequent positive academic outcomes. Teacher warmth serves a protective role in shy children's socio-emotional adjustment (Arbeau et al., 2010).

#### 2.2.2. Teacher self-efficacy

Teacher self-efficacy has been studied extensively in educational research (Klassen, Tze, Betts, & Gordon, 2011). According to Bandura's (1986) social cognitive theory, self-efficacy beliefs refer to "people's judgments of their capabilities to organize and execute the courses of academic action required to accomplish academic tasks" (p. 391). Individuals form their self-efficacy beliefs by interpreting information mainly from four sources, including mastery experience (i.e., previous attainments or performance), vicarious experience (i.e., observation of others performing tasks), social persuasion (i.e., verbal judgments provided by others), and physiological and emotional states (e.g., anxiety, stress, arousal, and mood states) (Bandura, 1986, 1997). The most influential source is the interpreted result of one's mastery

experience (Bandura, 1986; Usher & Pajares, 2008). In educational contexts, teacher self-efficacy is defined as the beliefs or judgments that teachers hold about their individual abilities to accomplish critical instructional goals even with difficult or unmotivated students (Tschanen-Moran & Woolfolk Hoy, 2001). Teachers' self-efficacy influences their pedagogical decision-making and professional behaviors (Ross, 1998; Wolters & Daugherty, 2007), as well as job satisfaction and students' academic achievement (Caprara, Barbaranelli, Steca, & Malone, 2006; Klassen et al., 2011; Morris-Rothschild & Brassard, 2006). Teachers with higher self-efficacy are more willing to try out innovative instructional methods to meet the diverse needs of students (Ross & Bruce, 2007), are more active in their responses to students with different types of constructive feedback (Gibson & Dembo, 1984), exhibit more warmth toward and acceptance of diverse students (Ash-ton & Webb, 1986), and persist longer when working with students who struggle academically rather than referring them to special education (Tschanen-Moran, Hoy, & Hoy, 1998). Conversely, teachers with lower self-efficacy are more likely to criticize students with incorrect responses (Gibson & Dembo, 1984), blame students for their lack of success or refer students to special education (Podell & Soodak, 1993), and demonstrate less resilience when confronted with challenges in the classroom (Ross, 1998).

### 2.2.3. Teacher-perceived child academic skills

Effective and successful school systems are supportive of the notion that strong academic outcomes are a combination of high behavioral and academic expectations in conjunction with high levels of student and adult support (Lee, Smith, Perry, & Smylie, 1999). Teachers have an opportunity to support students' academic development at all levels of schooling (Baker, Grant, & Morlock, 2008). Supportive relationships with teachers foster students' effortful engagement in learning, which leads to higher levels of achievement (Hughes, Luo, Kwok, & Loyd, 2008). Teachers may infer children's academic skills based on their perception of children's social and verbal behaviors in the classroom (Buss, Gingles, & Price, 1993; Keogh, 2003). Average children show a more positive attitude and involvement in school, participate more in the classroom, receive more instructional feedback from teachers, and achieve greater academic success (Elias, Zins, Graczyk, & Weissberg, 2003; Ladd, Birch, & Buhs, 1999). Children who display disruptive classroom behaviors that do not conform to teacher expectations (e.g., talking loudly, poking other children, being off-task) are at great risk of being underestimated by teachers in their academic potential (Espinosa & Laffey, 2003). Shyness is perceived by teachers as a potential protective factor for kindergarten children's adjustment to school (Rudasill & Kohnold, 2008) and shy children perceived as good listeners who do not get into trouble (Bosacki, Coplan, Rose-Krasnor, & Hughes, 2011). However, shy children's lack of verbal participation in the classroom is negatively associated with teachers' perceptions of their academic skills (Coplan et al., 2011). Poor academic achievement is a concern (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999), which can persist throughout middle and high school. Teachers' perceptions of children's low academic skills put them at risk of self-fulfilling prophecy, where teachers' low expectations negatively impact children's self-perceptions and consequently academic outcomes (Hauck, Martens, & Wetzel, 1986).

### 2.3. Teacher strategies

Teacher-child interactions appear to have a causal influence on children's cognitive, social, and behavioral development (Hamre & Pianta, 2005; O'Connor & McCartney, 2007; Raver et al., 2011). The interactions can be conceptualized as pedagogical responses or strategies that teachers apply in order to facilitate children's acquisition of preferred outcomes (Buchanan, Burts, Bidner, White, & Charlesworth, 1998). A substantial body of empirical evidence indicates that certain pedagogies referred to as *responsive teaching* are

associated with more positive developmental outcomes for children (Hamre, Hatfield, Pianta, & Jamil, 2014). Responsive teaching includes behaviors and strategies such as: accurately perceiving and interpreting children's behavioral cues and responding contingently to meet children's social, emotional and cognitive needs; promoting children's engagement, motivation, and persistence through encouragement, modeling and scaffolding; helping children make social connections; and supporting autonomy (Coppie & Bredekamp, 2009; Hamre et al., 2014; Tomlinson, 2009).

Research suggests that teachers tend to use different strategies with shy and exuberant children. Earlier research with preservice teachers (e.g., Cunningham & Sugawara, 1989; Sugawara & Cunningham, 1988) and in-service teachers (e.g., Brophy & Rohrkemper, 1981) suggested teachers were more likely to use social-learning strategies with hypothetical shy children (e.g., encourage social interaction), and high-powered strategies with hypothetical exuberant children (e.g., punish the child, intervene directly). Brophy and McCaslin (1992) suggested elementary teachers would support hypothetical shy children, encourage social interactions, and approach them with warmth, but they were more likely to restrain or change the physical environment for hypothetical exuberant children. Similarly, preschool teachers (Coplan, Bullock, Archbell, & Bosacki, 2015) and kindergarten teachers (Arbeau & Coplan, 2007) were more likely to intervene directly in response to hypothetical exuberant children's behaviors and promote their social skills. Elementary teachers in Bosacki et al.'s (2011) study created a positive classroom environment that encouraged self-expression, peer interaction, and teacher-child interaction for shy children.

### 2.4. Child gender

Child gender seems to play a role in teachers' attitudes and pedagogical strategies toward children displaying different behaviors. Previous research suggested gender significantly predicted differences in child aggression, student engagement, and teacher-child conflict, with teachers perceiving boys as more aggressive, having more conflictual relationships, and being less engaged compared with girls (e.g., Hamre & Pianta, 2001; Stipek & Miles, 2008). Shyness is less socially acceptable for boys than girls (Sadker & Sadker, 1994). However, some results from recent research indicate that teachers' attitudes and pedagogical strategies did not differ for shy boys and girls (e.g., Coplan et al., 2011; Arbeau & Coplan, 2007). In the present study, we were interested in whether preservice teachers would respond differently to shy, exuberant, and average children. Thus, the gender of the child was restricted in the vignettes (i.e., elementary school boys) in order to increase statistical power and control potential confounds between child gender and stereotypical expectations about behavior in the classroom (e.g., shy boys vs. shy girls).

### 2.5. Purpose of this study

The primary goal of the present study was to explore elementary preservice teachers' attitudes and pedagogical strategies toward children who were described in three vignettes as consistently demonstrating shyness, exuberance, or average behaviors in the classroom. A secondary goal was to see how these attitudes and pedagogical strategies differ when comparing preservice teachers early in the program with those completing the program. In terms of teacher pedagogical strategies, drawing on the literature with in-service teachers (Arbeau & Coplan, 2007; Coplan et al., 2011; Sugawara & Cunningham, 1988), we expected that preservice teachers would be more likely to use high-powered strategies for exuberant children (i.e., punish the child, intervene directly to stop/change the behavior, have the child apologize for his behavior) and more likely to use social-learning strategies for shy children (i.e., praise the child for appropriate behaviors, promote social skills, involve a classmate to help create a positive solution, encourage the child to join activities).

We hypothesized that preservice teachers would have lower academic expectations for shy children compared to exuberant children on the bases of previous research with in-service teachers and children's parents (e.g., Buss et al., 1993; Keogh, 2003). We anticipated preservice teachers would report lower teacher self-efficacy for teaching both shy and exuberant children compared with average children, drawing on existing research with in-service teachers (e.g., Coplan et al., 2011). We further expected that preservice teachers would be more likely to be warm and attentive to shy children than exuberant children (Arbeau et al., 2010; Hamre & Pianta, 2005).

We expected preservice teachers completing the program would report higher self-efficacy and more warmth working with children compared to those earlier in the program. Preservice teachers at the end of elementary education program were student teaching in the classroom full time. These preservice teachers had been exposed to more general lived experience working with elementary children in the classroom with different temperament-based behavior styles, potentially leading to more mastery experience (e.g., successful experience working with shy, exuberant, and average children) and vicarious experience (e.g., observing in-service teachers successfully working with shy, exuberant, or average children) (Bandura, 1986, 1997). We also speculated that there would be little change in preservice teachers' reported likelihood of using social-learning and high-powered strategies or their beliefs in children's academic success at the end of the program, given that preservice teachers in the program had not taken courses that specifically addressed the characteristics of temperamentally different children and corresponding pedagogical strategies that support the development of children demonstrating temperamentally shy or exuberant behaviors. Due to the lack of research on preservice teachers' attitudes and pedagogical strategies toward children frequently displaying different temperaments, hypotheses in the study were mainly exploratory in nature.

### 3. Method

#### 3.1. Participants

The sample included a total of 354 (women,  $N = 312$ , 89%) undergraduate preservice teachers enrolled in an elementary teacher education program in a large Midwestern university. Participants were recruited from three consecutive cohorts ( $N_1 = 85$ ,  $N_2 = 110$ ,  $N_3 = 159$ ), including Fall 2013, Spring, 2014, and Fall 2014. The majority was traditional undergraduate students (96%,  $N = 339$ , aged between 19 and 25) with the rest being non-traditional (4%,  $N = 15$ , aged between 26 and 50). Of the 354 participants, 62% were pursuing elementary education certification exclusively, 22% elementary special education certification, 9% inclusive education certification (i.e., combined early childhood, special education, and elementary education), 5% early childhood education certification, and 2% elementary English Language Learner (ELL) education certification. Thirty-four percent ( $N = 112$ ) participated in the study during their first semester in the education program while they were enrolled in an introductory course on ELLs in elementary classrooms, whereas the other 66% ( $N = 224$ ) participated during their last semester in their education program and were enrolled in a capstone course. The majority of the participants were white ( $N = 338$ , 95%), and the remainder identified as Hispanic ( $N = 5$ ), African American ( $N = 2$ ), Asian American ( $N = 1$ ), and Native American ( $N = 1$ ). Seven students did not report their ethnicity.

#### 3.2. Measures

Preservice teachers completed an adapted online version of the *Child Behavior Vignettes* (Coplan et al., 2011) to assess their attitudes and pedagogical strategies toward hypothetical shy (i.e., inhibited and high reactive, quiet), exuberant (i.e., uninhibited and low reactive, overly talkative), and average (i.e., not inhibited/shy or un-

inhibited/ exuberant, typical) child behaviors in the classroom. According to Coplan et al. (2011), the behavioral descriptions in the vignettes were developed on the basis of conceptualization of shy and exuberant children from existing literature (e.g., Fox et al., 2001; Rubin et al., 2009) and previous vignettes measuring mothers' beliefs and emotional responses toward child shyness and aggression (see Hastings & Rubin, 1999) and child prosocial, aggressive, shy, or disobedient behaviors (see Coplan et al., 2002), as well as kindergarten teachers' beliefs and responses to hypothetical prosocial, asocial, and antisocial children (Arbeau & Coplan, 2007). Each vignette was followed by two scales that measured teacher attitudes and pedagogical strategies. Preservice teachers were asked to think about how they would react to a particular behavior by rating a list of items on a scale ranging from 1 (very unlikely) to 5 (very likely).

##### 3.2.1. Teacher pedagogical strategies

Following each vignette, preservice teachers were asked to rate the likelihood that they would use various pedagogical strategies to respond to each type of child behavior. In the current study, seven items were adapted from previous research on teachers' pedagogical strategies for children with challenging behaviors, including shy/inhibited behaviors (i.e., avoiding eye contact, whispering, seldom participating in classroom discussion, and being nervous and hesitant in social situations), and exuberant/uninhibited behaviors (i.e., interrupting others, dominating classroom discussions, talking out of turn, and talking too loudly and too often) (see Arbeau & Coplan, 2007; Coplan et al., 2011). The items were grouped into two strategy categories: high-powered or social-learning. Social-learning strategies included four items (i.e., promote social skills; involve a classmate to help create a positive solution; praise the student for appropriate behaviors; encourage the student to join activities). High-powered strategies included three items (i.e., punish the student; intervene directly to stop/change the behavior; have the student apologize for his behaviors).

##### 3.2.2. Teacher attitudes

Preservice teachers rated their agreement with seven statements that described three categories of teacher attitudes toward hypothetical shy, exuberant, or average temperament-based child behavioral styles in the classroom. The specific teacher attitudes included warm feelings toward the child, self-efficacy in working with the child, and perception of the child's academic skills. The seven items were adapted from previous research (see e.g., Arbeau & Coplan, 2007; Coplan et al., 2011). Three items referred to teacher warmth (i.e., I would have sympathy for him; I would be especially supportive of him; I would be patient with him). Two items denoted teacher self-efficacy (i.e., I would feel adequately prepared to deal with him; I would not have enough time to give him the attention he requires [reverse coded]). Finally, two items were included to measure teacher-perceived child academic skills (i.e., This child has good language skills; The child will do well academically in my class).

### 3.3. Procedure

#### 3.3.1. Data collection

After receiving approval from the university Institutional Review Board and Elementary Program course instructors, potential participants were provided with study information and invited to participate at the beginning of Fall semester in 2013, Spring semester in 2014, and Fall semester in 2014. They completed the web-based survey within 30 min during a class period. Newly enrolled preservice teachers completed the survey during the first month of a semester (i.e., September for Fall semester in 2013 and 2014, January for Spring semester in 2014), whereas senior preservice teachers completed the survey during the last month of a semester (e.g., in December for Fall semester in 2013 and 2014, April for Spring semester in 2014). Before participation, all elementary preservice teachers

were asked to read carefully three different vignettes about elementary children whom they might find in their classroom. They were specifically instructed to imagine "if it was happening in your classroom today" and then responded to the questions that followed each vignette. The age of the child was not specified in the survey instruction and participants might imagine a child in a lower or higher grade (i.e., pk-6 grade) depending on participants' grade level(s) of practicum or student teaching during the present study. The texts of the vignettes are presented in the Appendix.

### 3.3.2. Data analyses

The first step was to examine the construct validity and reliability of the instrument (i.e., Child Behavior Vignettes; Coplan et al., 2011) measuring preservice teachers' attitudes and pedagogical strategies toward hypothetical shy, exuberant, and average children. Once validity and reliability were established for factors, we conducted initial analyses of descriptive statistics (i.e., means, standard deviations, skewness, and kurtosis) and potential covariates (gender, cohort, and certificate). We then conducted a 3 by 2 MANOVA (child temperament-based behavioral style x time in program) to answer research questions.

To examine the construct validity and reliability, exploratory factor analyses (EFAs) were conducted using Maximum Likelihood with Varimax-rotation in SPSS software (Version 21.0). EFAs resulted in five factors: teacher warmth, teacher self-efficacy, teacher-perceived child academic skills, social-learning strategies, and high-powered strategies, with the internal reliabilities (Cronbach  $\alpha$ ) being 0.71, 0.88, 0.70, 0.64, and 0.85, respectively. Next we conducted confirmatory factor analyses (CFAs) to verify the factor structure. We used Mplus software (Version 7.1, Muthen & Muthen, 2009–2014) with robust maximum likelihood estimation (robust to non-normality). The behavioral descriptions in the Child Behavior vignettes were based on conceptualization of shy and exuberant children from previous literature (e.g., Arbeau & Coplan, 2007; Coplan et al., 2011; Rudasill & Rimm-Kaufman, 2009; Stewart & Rubin, 1995). Therefore, we focused on the fit for shy and exuberant children. The fit was good for the shy and exuberant child type but not acceptable for the average child type. For detailed descriptions of the exploratory and confirmatory analyses, please refer to the supplementary information. Fig. 1 presents standardized factor loadings for the shy and bold child vignettes.

## 4. Results

### 4.1. Teacher's views of shy, exuberant, and average children

Descriptive statistics and correlations for the five factors are presented in Table 1. The mean value for each factor was the average score of item responses for that factor on the 5-point Likert scale. Using the cutoff limits of 2 for skewness and 7 for kurtosis for sample sizes ranging from 200 to 500 (West, Finch, & Curran, 1995), the skewness and kurtosis were within the acceptable range for all with the exception of one factor, high-powered strategies for average children (skewness = 3.10, kurtosis = 12.07). We conducted a log10 transformation and the skewness and kurtosis were within acceptable limits (skewness = 1.92, kurtosis = 3.75). Subsequent MANOVA analyses used this transformed variable.

A set of analyses were conducted to examine elementary preservice teachers' attitudes and pedagogical strategies as a function of children's temperament-based behavior style in a classroom (shyness, exuberance, and average) and time in the teacher education program (beginning, end). Initial tests indicated no significant teacher gender difference (women vs. men), no cohort difference (Fall 2013, Spring 2014, and Fall 2014), and no certificate difference (elementary only, inclusive, special education, and ELL certification) for all dependent variables. Thus, following analyses excluded the variables of teacher gender, cohort, and certificate type.

A 3 by 2 MANOVA (child temperament-based behavior style x time in program) using SPSS statistical software (Version 21.0) was conducted with child temperament-based behavioral style (shy, exuberant, and average) and time in teacher education program (beginning, end) as independent variables, and the five factors (teacher warmth, teach self-efficacy, teacher-perceived child academic skills, social-learning strategies, and high-powered strategies) as dependent variables. The interaction between child temperament-based behavior style and time in program was not significant and thus excluded. A follow-up MANOVA with main effects suggested a significant multivariate effect for the five factors as a group in relation to both temperament-based behavioral style and time in program (see Table 2).

#### 4.1.1. Teacher attitudes

We then conducted ANOVA with temperament-based behavior style (shy, exuberant, and average) as independent variable and three attitudes (teacher warmth, teacher self-efficacy, and teacher-perceived child academic success) as dependent variables (Table 2). Results revealed significant group differences for all three factors: teacher warmth,  $F(2, 354) = 46.31, p < 0.001$ , partial  $\eta^2 = 0.09$ ; teacher self-efficacy,  $F(2, 354) = 44.45, p < 0.001$ , partial  $\eta^2 = 0.08$ ; and teacher-perceived child academic skills,  $F(2, 354) = 242.78, p < 0.001$ , partial  $\eta^2 = 0.33$ . Post hoc comparison using the Bonferroni correction revealed preservice teachers were significantly more likely to be attentive and warm toward shy children ( $M = 4.36, SD = 0.51$ ) than exuberant children ( $M = 3.93, SD = 0.64$ ) or average children ( $M = 4.01, SD = 0.65$ ). No teacher differences in warmth were found between exuberant and average children.

Preservice teachers reported greater self-efficacy with average children ( $M = 4.36, SD = 0.65$ ) than either with shy children ( $M = 4.02, SD = 0.60$ ) or exuberant children ( $M = 3.96, SD = 0.64$ ). No differences in teacher self-efficacy were found between shy and exuberant children. Preservice teachers also perceived average children as more likely to be academically successful ( $M = 4.18, SD = 0.54$ ), with exuberant children being less likely ( $M = 3.62, SD = 0.62$ ), and shy children being least likely ( $M = 3.09, SD = 0.66$ ).

#### 4.1.2. Teacher pedagogical strategies

Results from follow up univariate analyses indicated significant between-group differences in teacher pedagogical strategies for three types of temperament-based behavioral style for social-learning strategies,  $F(2, 354) = 108.84, p < 0.001$ , partial  $\eta^2 = 0.18$ ; and high-powered strategies,  $F(2, 354) = 1248.38, p < 0.001$ , partial  $\eta^2 = 0.71$ . Post hoc comparisons using the Bonferroni correction revealed that preservice teachers were significantly more likely to use social-learning strategies for shy children ( $M = 4.28, SD = 0.46$ ), followed by exuberant children ( $M = 4.05, SD = 0.52$ ), and then average children ( $M = 3.59, SD = 0.69$ ). In contrast, preservice teachers reported they were significantly more likely to use high-powered strategies for exuberant children ( $M = 3.40, SD = 0.64$ ), followed by shy children ( $M = 1.80, SD = 0.49$ ), and then average children ( $M = 1.25, SD = 0.48$ ). All post hoc tests were significant.

#### 4.1.3. Beginning vs. end-of-program difference

The third research question was to compare preservice teacher attitudes and pedagogical strategies early in the teaching program to those at the end of the program. We conducted a one-way ANOVA with time in program (beginning vs. end) as independent variable and the five factors of attitudes and pedagogical strategies as dependent variables (Table 3). Results indicated significant differences for teacher warmth  $F(1, 334) = 21.33, p < 0.001$ , partial  $\eta^2 = 0.021$  and teacher self-efficacy,  $F(1, 333) = 28.69, p < 0.001$ , partial  $\eta^2 = 0.028$ . Preservice teachers at the end of the program reported greater self-efficacy for teaching all three types of children ( $M = 4.19, SD = 0.62$ ) compared to those at the beginning of the program ( $M = 3.97, SD = 0.67$ ). Preservice teachers at the end of the program re-

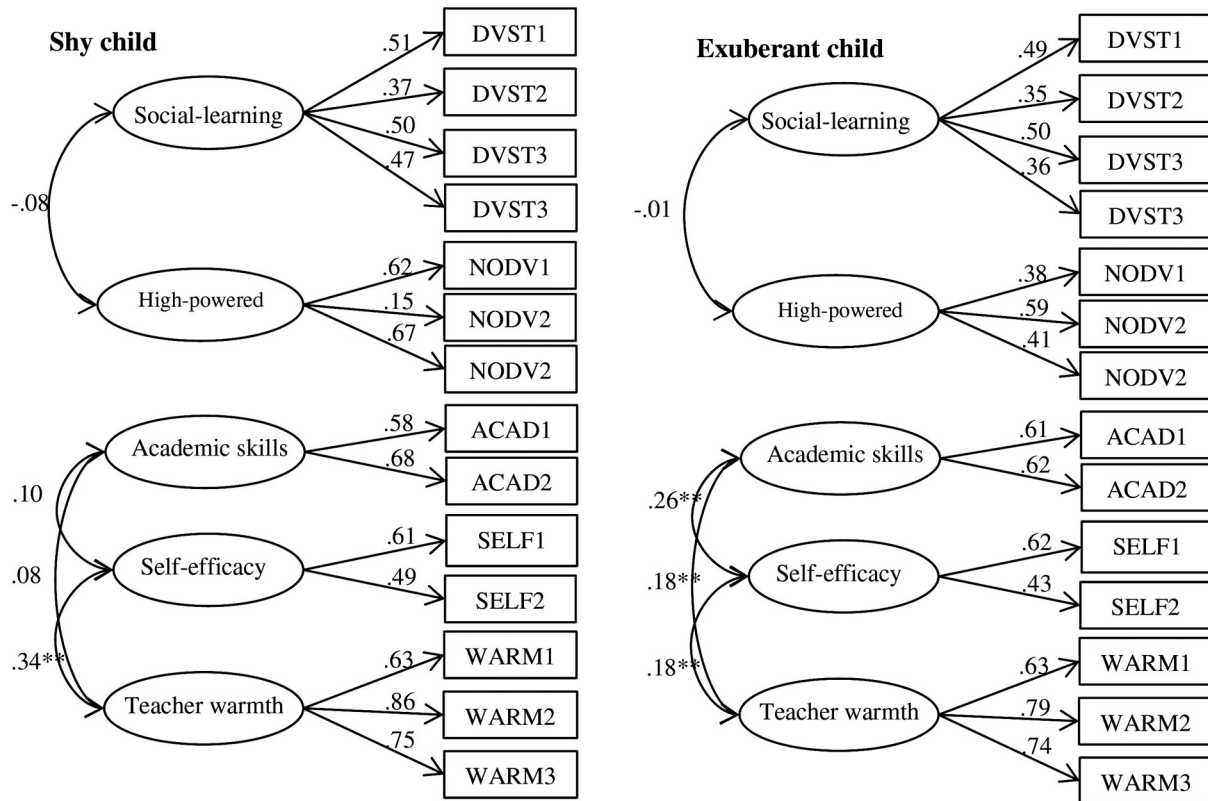


Fig. 1. Standardized factor loadings from confirmatory factor analysis with Mplus software.

Table 1. Descriptive statistics and Pearson correlations for the five factors by child type.

Variables	Shy child					Exuberant child					Average child				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1. WARM															
2. SELF	0.34**					0.26**					0.21**				
3. ACAD	0.08	0.10				0.18**	0.18**				0.19**	0.30**			
4. SOCL	-0.23**	-0.21**	-0.09			-0.19**	-0.05	-0.14*			-0.11*	-0.33**	-0.14**		
5. HPWR	0.36**	0.17**	0.07	-0.08		0.38**	0.12*	0.18**	-0.01		0.19**	0.08	0.06	0.11*	
Descriptive															
Min	3.00	2.00	1.00	2.75	1.00	2.33	2.00	2.00	2.50	2.33	2.50	1.50	2.00	1.70	1.00
Max	5.00	5.00	5.00	5.00	3.33	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.00
M	4.34	4.08	3.55	4.31	1.81	3.94	3.99	3.63	4.04	3.93	4.03	4.34	4.16	3.62	1.24
SD	0.49	0.60	0.63	0.43	0.46	0.60	0.66	0.60	0.54	0.62	0.66	0.65	0.54	0.65	0.47

*N* = 343, 342, and 338 for shy, exuberant, and average child, respectively. WARM = Teacher warmth; SELF = Teacher self-efficacy; ACAD = Teacher-perceived child academic skills; SOCL = Social-learning strategies; HPWR = High-powered strategies.

\*  $p < 0.05$ ; \*\*  $p < 0.01$

ported being warmer toward all three types of children ( $M = 4.16$ ,  $SD = 0.61$ ) compared to those at the beginning ( $M = 3.98$ ,  $SD = 0.64$ ). No difference was found for social-learning strategies, high-powered strategies, and teacher-perceived child academic skills.

## 5. Discussion

The primary goal of the study was to examine elementary preservice teachers' attitudes and pedagogical strategies toward hypothetical children displaying shy, exuberant, and average behaviors. A secondary goal was to compare attitudes and pedagogical strategies at the beginning and end of teacher training program. Overall, preservice teachers showed distinctly different attitudes and pedagogical strategies. They were also more likely to be attentive and warm toward shy children – but perceived them as less academically successful than either exuberant or average children. Unsurprisingly,

preservice teachers reported the highest self-efficacy working with average children. Preservice teachers were more likely to use high-powered strategies in interactions with exuberant children and social-learning strategies with shy children. Finally, preservice teachers at the end of the program reported higher warmth and self-efficacy for all types of children. The results are discussed in the following.

### 5.1. Teacher warmth

Preservice teachers reported more likelihood to be attentive and warm toward shy than exuberant or average children. The finding is similar with some previous work with preschool teachers. For instance, Coplan and Prakash (2003) observed that shy children received more interactions from teachers in preschool classrooms than their less shy peers. Teachers tended to interact with shy children to engage them in productive social interactions. This is consistent

**Table 2.** Multivariate and univariate analyses for teacher attitudes and teacher pedagogical strategies.

Variable	MANOVA <i>F</i> (5, 354)	Teacher warmth	Teacher self-efficacy	Teacher-perceived child academic skills	Social-learning strategies	High-powered strategies
Child behavior	333.44*	48.36*	38.69*	265.55*	126.63*	1400.79*
Time of program	8.63*	21.34*	28.34*	0.04	3.11	1.66

*F* ratios are Wilks' approximation of *F*.

\*  $p < 0.001$ .

**Table 3.** Means and standard deviations of teacher attitudes and pedagogical strategies as a function of time in program.

Time of program	Teacher warmth		Teacher self-efficacy		Teacher-perceived child academic skills		Social-learning strategies		High-powered strategies	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Beginning	3.98	0.65	3.97	0.68	3.64	0.79	3.93	0.63	2.18	1.08
End	4.17	0.61	4.20	0.63	3.63	0.74	4.00	0.63	2.13	1.04

with the focus of preschool education as a more play-based and social-emotional skill-building environment (Saracho, 2012). However, Rudasill and Rimm-Kaufman (2009) observed in a sample of first graders that shy children received fewer teacher-initiated interactions than their less shy peers. At the same time, shy children were also less likely to initiate interactions with teachers, resulting in fewer teacher-child interactions overall, and, thus, a lower "dose" of instruction. It is possible that preservice teachers' perceptions of behavior are based on an ideal (i.e., assuming no additional different disruptive behaviors demonstrated by other children in the classroom), whereas observed behaviors in actual classroom are more reflective of the day-to-day demands of teaching many students displaying diverse behaviors. That is, teachers have to balance between spending time on shy children's social skills and other demands that come with different students (e.g., disruptive child behaviors, content knowledge delivery, classroom management). Nevertheless, preservice teachers note that additional attention and warmth may be needed by shy children, because teacher warmth and positive teacher-child relationships are associated with positive social-emotional adjustment of shy children in early elementary school (Arbeau et al., 2010).

Preservice teachers were less likely to be warm to exuberant than shy and average children. It is possible that preservice teachers tend to respond to exuberant children, who are typically inattentive and disruptive, with more high-powered strategies such as restriction, punishment, and immediate control (Coplan et al., 2011; Stipek & Miles, 2008; Thijs et al., 2006), and less social development strategies such as promoting social skills and involving a classmate to help create positive solution. Fortunately, preservice teachers reported relatively high warmth (e.g., patience, sympathy, and support) toward exuberant children ( $M = 3.94$ ). Teacher warmth and support is particularly important for children exhibiting behavioral or temperamental risk, as it affects student emotional and academic outcomes (Curby et al., 2011; Hamre & Pianta, 2005).

## 5.2. Teacher self-efficacy

Preservice teachers perceived the most self-efficacy in working with average children compared to shy or exuberant children. Self-efficacy can affect one's particular course of action in dealing with a situation (Bandura, 1986; Usher & Pajares, 2008). Some teachers might avoid situations or student-teacher interactions that they believe exceed their instructional capabilities, whereas others will get involved and engaged when they judge themselves capable of handling situations that would otherwise be intimidating or unsuccessful. As noted earlier, classroom teachers provided more instructional feedback to average children compared with shy or exuberant children (Elias et al., 2003; Ladd et al., 1999). Preservice teachers might be more in-

clined to give feedback to children who are actively engaged in the classroom because they were more confident in their instructional abilities in dealing with an average child than a shy or exuberant child. As preservice teachers develop their instructional self-efficacy, we predict that they will become more comfortable working with a variety of children in the classroom (e.g., average, shy, or exuberant).

## 5.3. Teacher-perceived child academic skills

Preservice teachers perceived that shy children would have poorer language skills and do more poorly academically than both exuberant and average children. This is in line with previous research with in-service teachers who reported that shy children were less intelligent and would perform less well academically (Coplan et al., 2011). The quiet nature of shy children might be perceived as a lack of interest in understanding academic content (Crozier & Perkins, 2002) or a lack of language skills or intelligence to have academic conversations. Because shy children are reluctant to volunteer or answer questions and often are not assertive in their interactions, they can be perceived as not having the ability to meet "the academic and behavioral demands of the classroom" (Rudasill & Konold, 2008, p. 660). Children with active engagement (e.g., high level of cooperation and low level of self-control) respond readily to teacher instructions and follow classroom rules. Shy children's lack of engagement in the classroom can partially account for the perceived poorer academic skills. Highly efficacious teachers use specific instructional behaviors that foster academic achievement (Langer, 2000). These behaviors include maintaining on-task behaviors in students, focusing on academic instruction, direct instruction, hands-on learning, simulations, inquiry, and other strategies that require higher order skills (Langer, 2000). Varied use of instructional strategies is a way to engage all students and increase their learning. For example, the use of four or more instructional activities within a single instructional segment increased all students' engagement, which leads to higher academic achievement (Zahorik, Halbach, Ehrle, & Molnar, 2003).

## 5.4. Use of social-learning and high-powered pedagogical strategies

Preservice teachers were more likely to use high-powered strategies (i.e., punish the child, intervene directly to stop/change the behavior, and have the child apologize for his behavior) as they interacted with exuberant children than with shy and average children. Previous research reported similar results with in-service teachers, where teachers would directly intervene with disruptive behaviors using a combination of high-powered strategies (Coplan et al., 2011; Thijs et al., 2006), probably due to the disruptive nature of these behaviors. Preservice teachers also reported a higher tendency to use

high-powered strategies with shy children than average children, congruent with previous work with in-service teachers (Thijs et al., 2006). Preservice teachers' tendency to use high-powered pedagogical strategies has important implications for the development of shy and exuberant children. Preservice teachers might believe behaviors stemming from shyness and exuberance to be externally caused and thus easily changeable (Stifter, Putnam, & Jahromi, 2008). Similarly, adults (e.g., Coplan et al., 2002) and in-service teachers (e.g., Arbeau & Coplan, 2007) tend to attribute negative behaviors to external causes. Although preservice teachers might intend to eliminate the disruptive behaviors and promote positive ones, these strategies (e.g., punish the child or have the child apologize for his behavior) do not help reduce the disruptive behaviors of exuberant children (Stipek & Miles, 2008) or enhance social behaviors of shy children. Both shy and exuberant children may need extra supports for their social behaviors (e.g., encouraging social interaction and self-monitoring, providing constructive feedback and guidance) conducive to social and emotional development (Brophy & McCaslin, 1992; Stewart & Rubin, 1995).

In this study, social-learning pedagogical strategies included praising the child for appropriate behaviors, promoting social skills by modeling appropriate behaviors, involving classmates to help create positive solutions, and encouraging the child to join activities to increase social interactions (see Coplan et al., 2011 for details). Our results suggest preservice teachers were more likely to use social-learning strategies for shy and exuberant children than average children. The result for average children is not surprising because these children's behaviors do not warrant any intervention. The findings with shy and exuberant children are similar with previous work with in-service teachers (Brophy & McCaslin, 1992; Coplan & Prakash, 2003; Coplan et al., 2011; Thijs et al., 2006). For example, teachers were more likely to endorse social-learning strategies that support social interactions for shy children in response to their tendency to withdraw as well as exuberant children in response to their inattention and impulsivity (Coplan et al., 2011; Pelletier, Collett, Gimpel, & Crowley, 2006). Preservice teachers' responses to shy and exuberant children are promising because these social-learning strategies provide opportunities to improve both shy and exuberant children's social interactions with their teachers and peers. Intervention strategies focusing on social skills training have shown success in increasing social skills for shy children (Bienert & Schneider, 1995; Coplan, Schneider, Matheson, & Graham, 2010; Evans, 1992). Evans (1992) found that shy children increased their verbal participation and spontaneity after teachers made more indirect statements (e.g., personal contributions) and asked fewer direct questions. Positive social interaction with others is also critical for highly exuberant preschool children to reduce cortisol reactivity (Tarullo, Mliner, & Gunnar, 2011). Conversely, teacher-child conflict relates to children's increased misbehaviors and lower engagement (Silver, Measelle, Armstrong, & Essex, 2005; Stipek & Miles, 2008).

Overall, we acknowledge that it is appropriate for preservice teachers to intervene directly exuberant behaviors in the classroom (e.g., the child is interrupting the teacher or other children), but high-powered strategies are not likely to support children's engagement in classroom activities or child-teacher relationship. Additional efforts to ensure social skills (e.g., modeling appropriate behaviors) may compensate for high-powered strategies.

### **5.5. Differences between early and late program preservice teachers**

Preservice teachers at the end of the program reported higher warmth and self-efficacy toward all types of children than those at the beginning of the program. It complies with Bandura's (1986, 1997) notion that people's judgments of efficacy are developed and revised as they interpret information from their prior experiences. Preservice teachers finishing their programs had more exposure to

both university courses related to developmental psychology and field experiences such as practicums and student-teaching experiences. These field experiences provide preservice students opportunities to learn about, observe, and work with children displaying different behaviors. As a result, preservice teachers with relatively more mastery or vicarious experiences tended to judge themselves as more capable of working with diverse students. Conversely, preservice teachers who had just begun their education program and had little to no training or field experiences working with diverse children were more likely to judge themselves as less capable. Indeed, people's mastery or unsuccessful performance experiences are probably the most salient and reliable indicators of efficacy (Pajares, 1997; Usher & Pajares, 2008). Preservice teachers finishing their programs reported greater likelihood to be patient, warm, and supportive to all children. Such teacher behavior is key to promoting a positive environment for children's behavioral and cognitive development (Hamre & Pianta, 2001, 2005, 2006).

No difference was found as a function of time in an elementary education program in preservice teachers' use of social-learning and high-powered strategies or their perception of children's academic skills. The preservice preparation program these students experienced is typical in that there is limited training on individual differences in children's temperament, the ways that those differences manifest as behavior in the classroom, and effective strategies for managing behavior based on children's temperament. Thus, we would be less inclined to see growth in preservice teachers' perceptions or strategies of children's academic skills, particularly as a function of temperament-based behavior. Yet, research shows that children respond differently to the classroom environment depending on temperament (Kalutskaya et al., 2015; McClowry, 2016) and using a temperament-based lens for understanding children's behavior in the classroom leads to improvements in children's academic and behavioral outcomes (e.g., O'Connor, Cappella, McCormick, & McClowry, 2014a). Our results suggest that preservice-teacher training should include ample opportunities, perhaps through educational psychology or developmental psychology courses, for learning about (1) individual differences in children's behavior that are temperament based and how these differences influence student learning; and (2) developmentally responsive strategies or pedagogies that meet students' different developmental needs and facilitate academic success (Horowitz et al., 2005). Pedagogies that are developmentally inappropriate not only impede child development and academic learning, but also interrupt learning and further encourage disruptive behaviors (Horowitz et al., 2005).

### **6. Limitations**

Several limitations need to be noted in the interpretation of results from this study. The sample used in the study is somewhat different than the national average for preservice teachers. We were able to recruit a reasonably large sample of preservice teachers. The participants were mainly women (89%, versus 86% nationally) and white (95%, versus 81% nationally) (Goldring, Gray, & Bitterman, 2013). It is not known whether preservice teachers' own temperament interacts with how they react to children with different temperaments. We are currently analyzing the relationship using the same sample. In addition, regarding the significant time differences (beginning vs. end of program) for preservice teachers' warmth and self-efficacy, no claims can be made about the causality of the effects because no intervention was put in place and the data was cross-sectional.

Moreover, the vignettes only included boys. No consensus is reached regrading child gender role in teachers' attitudes and strategies. Stipek and Miles (2008) suggested that teachers perceived boys as more aggressive and less engaged compared with girls. Shyness is more socially acceptable for boys than girls (Sadker & Sadker, 1994). However, results from some other studies suggest that teachers' attitudes and strategies did not differ for boys and girls (e.g., Coplan

et al., 2011; Rubin et al., 2007). In this study, the sample was composed of preservice teachers, it is unknown whether they might have different attitudes or respond differently to girls displaying similar temperament-based behavioral styles.

Preservice teachers in present study were trained to work with elementary children at a broad age range (i.e., K-6 grade children). Despite previous work (e.g., Coplan et al., 2011) with in-service teachers at a wide range of grade levels (e.g., k-8) reported that grade levels did not contribute to difference in teachers' attitudes and strategies toward children demonstrating shyness, exuberance, or average behaviors, our participants were preservice teachers. The participants were instructed to imagine the type of children in the vignettes being in their classroom without specification for the child age. It is possible that these participants imagined a child in different grades depending on participants' grade level of practicum or student teaching during the present study. If so, different outcomes regarding attitudes and strategies might exist between preservice teachers working with lower grades (e.g., preschool, kindergarten) and higher grades (4th, 5th, and 6th grade).

Another potential limitation is the unacceptable fit for average child for the constructs of teacher attitudes and pedagogical strategies. This might be due to the fact that the behavioral descriptions in the Child Behavior Vignettes were based on conceptualization of shy (i.e., inhibited and high-reactive, quiet) and exuberant (i.e., uninhibited and low-reactive, overly talkative) children (e.g., Coplan et al., 2011; Fox et al., 2001; Rubin et al., 2009). Average (i.e., not inhibited and uninhibited, typical) behaviors described in the vignettes for average children might not require a teacher response in the same way as those described for shy and exuberant children. We kept the results for typical children to examine potential differences regarding preservice teachers' attitudes and pedagogical strategies for children with different temperament-based behavior styles. However, due the unacceptable fit for average child vignette, the difference was mainly exploratory. In future research, we will examine preservice teacher attitudes and pedagogical strategies toward children of different genders (boys and girls) and cultural backgrounds.

Last, the definition of developmentally appropriate practice in an ecologically valid way is necessarily a complex endeavor. For example, some controversy exists as to whether such definitions can accommodate sociocultural context and children's unique developmental needs (see Raines & Johnston, 2003). We acknowledge that *appropriateness* in practice necessitates responsiveness to a particular child in a particular context. The concern for responsiveness to cultural and individual factors is not unique to this study, but is relevant to any effort to measure or define high quality teaching practices.

## 7. Conclusion

This study is the first to examine preservice teachers' attitudes and pedagogical strategies for children with shy (i.e., inhibited and high-reactive, quiet), exuberant (i.e., uninhibited and low-reactive, overly talkative), and average (i.e., not inhibited/shy or uninhibited/exuberant, typical) behaviors. The results about exuberant children were expected, with preservice teachers' higher tendency to use high-powered strategies. However, preservice teachers' attitudes and pedagogical strategies toward shy children illuminate the complex challenges teacher educators still face when trying to prepare teachers to support all students. It is promising that preservice teachers tend to use social-learning strategies with shy children to promote their social skills; they are also more likely to be warm and attentive to shy children. On the other hand, preservice teachers had lower expectations of shy children compared to exuberant and average children. Preservice teachers expected shy children to have less advanced language skills and to perform more poorly in academics. General teacher education experiences seemed to influence preservice teachers' attitudes toward shy children. Preservice teachers at the end of the program were more efficacious and more attentive

to both shy and exuberant children. General teacher education experiences, however, did not affect preservice teachers' expectation toward shy children, and preservice teachers at the end of the program still expected shy children to have lower advanced language skills and to do worse academically. General teacher education experiences may not have impact on preservice teachers' strategies toward shy children without specific programmatic intervention.

## 8. Implications

Despite the limitations, findings from this study have implications for educating preservice teachers. Explicit instruction about the variations in children's temperament, including effective ways of interacting with students with different temperaments, has been shown to result in better social, behavioral, and academic outcomes, particularly for children whose behavior is not well aligned with the classroom environment (such as shy children or those who are more negative; O'Connor et al., 2014a). Evidence for this comes from a randomized control trial of INSIGHTS, a temperament-based social emotional skills program for young elementary students and their teachers. O'Connor et al. (2014a); O'Connor, Cappella, McCormick, and McClowry (2014b) found that teachers who received information about different temperament types (e.g., shy, sociable/outgoing, negative, and industrious), learned methods for interacting with individuals with different types of temperament, and practiced strategies for behavior management of different temperament types had students who were better behaved and more skilled socially and academically. In addition, teachers who received the INSIGHTS intervention displayed more sensitivity, warmth, and positive interactions toward students (Cappella et al., 2015).

## Appendix A. Text of child behavior vignettes

### A.1. Shy child

Adam does not volunteer to speak in class. He often appears nervous and hesitant, especially in social situations. When you question him directly, he avoids eye contact, and either whispers or does not respond at all. He does not like to be the center of attention and rarely participates or contributes when working in groups with other children.

### A.2. Exuberant child

Noah often blurts out answers and comments in class, frequently interrupting you as well as other children. He often cannot contain his exuberance and tends to speak too loudly and too often. When working in groups with other children, he has difficulty waiting his turn to talk and tends to dominate the conversation.

### A.3. Average child

Andrew displays a typical pattern of verbal participation in class and in most respects his behaviors are what might be expected from an average child his age. He volunteers to speak in class on a regular basis, and typically puts up his hand before talking. Although he is not necessarily a group leader, he is often an active participant and contributor to group activities with other children.

## Appendix B. Supplementary data

Construct Reliability and Validity of Vignette Responses and Table 1. Results of Confirmatory Factor Analysis for Teacher Attitudes and Pedagogical Strategies follow the **References**.

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### **Construct Reliability and Validity of Vignette Responses**

The structural dimensionality for the five factors (i.e., teacher warmth, teacher self-efficacy, teacher-perceived child academic skills, social-learning strategies, and high-powered strategies) has not been previously examined, thus exploratory factor analyses (EFAs) were conducted to investigate the factorial validity. EFA for teacher attitudes resulted in a three-factor solution for all three types of children: teacher warmth, teacher self-efficacy, and perceived academic skills. The three factors explained 70% of the total variance for attitudes toward a shy child, 68% for attitudes toward an exuberant child, and 72% of the variance in attitudes toward an average child. All factor eigenvalues were greater than 1.0. Internal reliabilities (Cronbach  $\alpha$ ) were .88, .71, and .70 for teacher self-efficacy, teacher warmth, and perceived academic skills, respectively. EFA of teacher pedagogical strategies resulted in a two-factor solution for all three types of children, suggesting a factor of social-learning strategies and a factor of high-powered strategies. The two factors explained 44% of the total variance for strategies used with a shy boy, 45% for strategies used with an exuberant boy, and 56% of the variance in strategies used with an average boy. Internal reliabilities (Cronbach  $\alpha$ ) were .64 and .85 for social-learning strategies and high-powered strategies, respectively. The reliability for social-learning strategies (.64) could not be improved by eliminating any variables.

Separate confirmatory factor analyses (CFA) for teacher attitudes and pedagogical strategies were conducted to test the construct validity of the instrument and internal consistency of factors (Table 1). We first conducted CFA for teacher strategies to examine the goodness of fit of the data to the proposed two-factor model for each type of child. The fit for shy child was good,  $\chi^2(16) = 28.956$ ,  $p = .024$ , with good fit for CFI = .900, good fit for RMSEA = .049 [90% CI = .018, .078], and good fit for SRMR = .06. The fit for exuberant child was good,  $\chi^2(15) = 28.210$ ,  $p = .020$ , with reasonable fit for CFI = .917, good fit for RMSEA = .051 [90% CI = .020, .080], and good fit for SRMR = .063. The fit for average child was not acceptable,  $\chi^2(15) = 221.299$ ,  $p < .001$ , with unacceptable fit for CFI = .220, unacceptable fit for RMSEA = .203 [90% CI = .180, .227], and unacceptable fit for SRMR = .103.

We then conducted CFA for teacher attitudes to establish the goodness of fit of the data to the three-factor model. The fit for shy child was good,  $\chi^2(21) = 22.934$ ,  $p = .042$ , with good fit for CFI = .972, good fit for RMSEA = .048 [90% CI = .009, .079], and good fit for SRMR = .036. The fit for exuberant children was good,  $\chi^2(21) = 16.493$ ,  $p = .223$ , with good fit for CFI = .974, good fit for RMSEA = .043 [90% CI = .000, .076], and good fit for SRMR = .035. For teacher strategies towards an average child, no convergence was achieved, indicating an unacceptable fit.

Table 1  
Results of Confirmatory Factor Analysis for Teacher Attitudes and Pedagogical Strategies

Items/Factors	Shy		Exuberant		Average	
	Loading	S.E.	Loading	S.E.	Loading	S.E.
<b><i>Teacher Warmth</i></b>						
12. I would have sympathy for the child.	<b>.63*</b>	.05	<b>.63*</b>	.05	-	-
13. I would be especially supportive of the child.	<b>.86*</b>	.04	<b>.79*</b>	.05	-	-
14. I would be patient with the child.	<b>.75*</b>	.04	<b>.74*</b>	.04	-	-
<b><i>Teacher self-Efficacy</i></b>						
10. I would feel adequately prepared to deal with him.	<b>.61*</b>	.06	<b>.62*</b>	.06	-	-
11. I would not have enough time to give him the attention he requires <sup>1</sup> .	<b>.49*</b>	.05	<b>.43*</b>	.05	-	-
<b><i>Perceived Academic Skills</i></b>						
8. He has good language skills.	<b>.58*</b>	.04	<b>.61*</b>	.04	-	-
9. He will do well academically in my class.	<b>.68*</b>	.05	<b>.62*</b>	.04	-	-
<b><i>Social-learning strategies</i></b>						
1. Praise him for appropriate behaviors.	<b>.51*</b>	.123	<b>.49*</b>	.04	<b>.24*</b>	.09
2. Promote social skills (e.g., instruct individually, model appropriate behaviors).	<b>.37*</b>	.127	<b>.35*</b>	.03	.76	.49
3. Involve a classmate to help create a positive solution.	<b>.50*</b>	.121	<b>.50*</b>	.05	.06	.09
4. Encourage him to join activities (e.g., sports, music).	<b>.47*</b>	.122	<b>.36*</b>	.03	.20	.24
<b><i>High-powered strategies</i></b>						
5. Punish the child.	<b>.62*</b>	.18	<b>.38*</b>	.116	<b>.02*</b>	.01
6. Intervene directly to stop/change the behavior.	<b>.15*</b>	.10	<b>.59*</b>	.090	<b>.66*</b>	.05
7. Have him apologize for his behavior.	<b>.67*</b>	.13	<b>.41*</b>	.139	<b>.71*</b>	.07

Note. \*  $p < .05$ . S.E.=Standard Error. <sup>1</sup>= reverse-coded.