



# Teachers' self-efficacy and perceptions of school climate are uniquely associated with students' externalizing and internalizing behavior problems

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## ABSTRACT

Early externalizing and internalizing problems undermine children's school success and long-term well-being. Leveraging a large, U.S.-representative dataset ( $N \approx 14,810$ ), we examined how kindergarten teachers' self-efficacy and school climate perceptions were linked to students' behavior problems in kindergarten and first grade. Teachers' self-efficacy and school climate perceptions were uniquely linked to kindergarteners' externalizing and internalizing behaviors, after controlling for demographic covariates and children's executive functions. Kindergarten teachers' higher self-efficacy predicted lower levels of children's externalizing problems in first grade, while teachers' positive school climate perceptions predicted children's lower internalizing problems in first grade. Longitudinal models demonstrated that teachers' perceived school climate and self-efficacy were uniquely associated with decreases in children's externalizing and internalizing behaviors from kindergarten to first grade. Findings highlight the importance of teachers' self-efficacy and school climate for children's socio-emotional development and underscore an urgent need to determine how best to support teacher well-being to optimize children's outcomes.

## Introduction

Externalizing and internalizing behaviors during early childhood, such as impulsivity, aggression, inattention, and anxiety, are linked to children's abilities to engage and learn in classroom settings (Okano, Jeon, Crandall, Powell, & Riley, 2020; Searle, Sawyer, Miller-Lewis, & Baghurst, 2014) and have long-term implications for their mental health and well-being (Coplan & Rubin, 2010; Moffitt, 1993; Shaw, Hyde, & Brennan, 2012; Weeks et al., 2016). Childhood externalizing behaviors, characterized by aggression, impulsivity, and hyperactivity (Achenbach, 1991), are associated with later antisocial behaviors, substance dependence, and delinquency (Liu, 2004). Internalizing behaviors, characterized by loneliness and sadness (Achenbach, 1991), are related to later mental health problems such as depression and anxiety (Colman, Wadsworth, Croudace, & Jones, 2007; Coplan & Rubin, 2010). The sustained implications of these early behavioral difficulties for children's life-long well-being highlight a critical need to determine the factors that contribute to their onset, particularly in the early school years when children are adjusting to the demands of the formal schooling environment.

As children make the transition into kindergarten, teachers are fundamental in shaping their school adjustment and healthy behavioral development. Indeed, several studies have shown that close early relationships with teachers are longitudinally associated with children's academic skills, self-regulation and prosocial behavior (Acar, Torquati, Raikes, & Rudasill, 2021; Cadima, Doumen, Verschueren, & Buyse, 2015; Hatfield, Finders, Zandbergen, & Lewis, 2021). Far fewer studies have examined teachers' personal characteristics and perceptions of the school environment in relation to children's externalizing and internalizing behavior. The current crisis of teacher burnout and turnover underscores the dire need for research to understand how teachers' own psychological health might impact children's well-being (Farley & Chamberlain, 2021; Steiner & Woo, 2021; Torpey, 2018). As a starting point for addressing the dearth of knowledge in this area, the current study examined how teachers' perceptions of their own competence and workplace environments might be linked to children's externalizing and internalizing behaviors during the transition to formal schooling.

There is a strong conceptual basis for hypothesizing that teacher characteristics and perceptions play a unique role in shaping children's behavior. According to Jennings and Greenberg (2009) Prosocial

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Classroom Model, teachers' levels of well-being set the overall emotional tone of the classroom. Teachers with a strong sense of well-being and a positive emotional outlook provide a healthy model for children's socio-emotional competence and self-regulation development and can engage in effective, close interpersonal relationships with students. In contrast, the Prosocial Classroom Model proposes that teachers who are emotionally exhausted, subject to negative emotions, stress, and perceived lack of workplace support are less able than teachers without these stressors to model effective self-regulation and behavioral guidance for children. As a result, children's inappropriate and challenging behaviors, including externalizing and internalizing behavior, increase. The model also assumes a feedback loop, where these accelerating levels of externalizing and internalizing behavior in children further exacerbate teachers' negative perceptions and reduce their sense of competence. Acknowledging that several school-based, social, and personal factors likely impact teachers' capacities to create a prosocial classroom environment, we focus on two variables of known relevance for teachers' behaviors: teacher self-efficacy and perceptions of school climate.

#### *Teacher self-efficacy*

Teacher self-efficacy is conceptualized as a teacher's belief in their ability to carry out their professional tasks, including the belief that they can bring about changes in students' achievement and behavior (Geerlings, Thijs, & Verkuyten, 2018; Morris, Usher, & Chen, 2017). Relative to lower levels, higher levels of self-efficacy generally correlate with the use of effective coping strategies and with resilience to setbacks, presumably because individuals with high self-efficacy have positive outcome expectancies regarding their ability to perform a specific task (Bandura, 1977; Giallo & Little, 2003). Accordingly, teacher self-efficacy is a key predictor of teaching behavior (Guo, Piasta, Justice, & Kaderavek, 2010; Klassen & Tze, 2014). Teachers with higher levels of self-efficacy are more proactive and less coercive in their management of student behavior and are more adept at encouraging student motivation and engagement than those with low self-efficacy (Zee & Koomen, 2016). Further, teachers with high levels of self-efficacy demonstrate high levels of emotional support and responsiveness toward children, as well as a strong focus on children's academic growth (Justice, Mashburn, Hamre, & Pianta, 2008; Klassen & Tze, 2014). Teacher self-efficacy also correlates with strong student-teacher relationships, characterized by high levels of warmth and low levels of conflict (Guo et al., 2010; Zee & Koomen, 2016).

A limited number of studies suggest that teachers with high self-efficacy tend to report fewer student behavioral problems and higher levels of social-emotional skills relative to their colleagues with low self-efficacy (Mashburn, Hamre, Downer, & Pianta, 2006; McLean, Eklund, Kilgus, & Burns, 2019). For instance, Mashburn et al. (2006) found that teachers' self-efficacy scores correlated positively with teacher ratings of children's social skills, after controlling for a variety of child and teacher demographic factors and school organizational variables. Similarly, McLean et al. (2019) found that teacher self-efficacy correlated cross-sectionally and negatively with ratings of student emotional problems. It is possible that teachers with stronger, as opposed to weaker, self-efficacy also have positive attitudes toward teaching and see children as being more teachable in the face of effective behavior management strategies (Rimm-Kaufman & Sawyer, 2004), thereby contributing both to how they interact with children who show externalizing and internalizing behavior and to their perceptions of students' behavior as less problematic. Teachers with high self-efficacy also report lower levels of stress and burnout and a greater sense of collective self-efficacy within the workplace relative to those with low efficacy (Egyed & Short, 2006; Skaalvik & Skaalvik, 2007), which may foster more effective classroom management practices and positive perceptions of students' behavior (McLean et al., 2019). As such, teacher self-efficacy may play a crucial role in fostering children's behavioral development through its association with teachers' well-being, outlook, and capacity to provide a

positive, prosocial learning environment.

#### *Teacher perceptions of school climate*

School climate includes the overall tone, norms, and attitudes within a school that affect staff and student interactions (Aldridge & Fraser, 2016; Johnson & Stevens, 2001). Studies of teachers have identified several aspects that comprise their perceptions of school climate, including their perceived access to instructional supplies, connection to and support from parents, colleagues and administration, school expectations for student achievement and behavior, involvement in decision making, and general school morale (Hoy & Woolfolk, 1993; Johnson, Stevens, & Zvoch, 2007; Ouellette et al., 2018). Negative teacher perceptions of school climate are linked to emotional exhaustion and burnout (Fernet, Guay, Senécal, & Austin, 2012; Pas, Bradshaw, & Hershfeldt, 2012), which correlate with lower academic achievement and lower elementary school student ratings of teacher support (Arens & Morin, 2016). Conversely, teacher perceptions of support from administrators and other staff are linked positively with teacher self-efficacy and teacher satisfaction and negatively with teacher stress (Collie, Shapka, & Perry, 2012; Malinen & Savolainen, 2016). Importantly, studies suggest that a majority of the variance in teacher ratings of stress, burnout, and broader school climate is between teachers within schools, as opposed to between schools (Pas et al., 2012). That is, teachers' individual psychological perceptions and interpretations of school climate and associated levels of support appear to be a potent variable beyond objective variation between schools (McCarthy, Lambert, O'Donnell, & Melendres., 2009; Pas et al., 2012). It is thus important to examine teachers' perceptions of school-level factors.

While few studies have examined how perceptions of school climate link to students' behavior, the existing literature suggests that teachers with negative climate perceptions endorse more externalizing and internalizing behaviors in children than those with positive climate perceptions (O'Brennan, Bradshaw, & Furlong, 2014; Pas & Bradshaw, 2014). For instance, after accounting for child race and gender, child academic achievement, school socio-demographics, and classroom levels of students' attentional challenges and prosocial behaviors, elementary teachers' perceptions of the school climate accounted for unique variance in their ratings of students' problem behaviors (O'Brennan et al., 2014; Pas & Bradshaw, 2014). Relatedly, teachers who endorsed higher levels of workplace stress, including lower levels of support from co-workers and supervisors, also reported higher levels of conflict in their relationships with students (Whitaker, Dearth-Wesley, & Gooze, 2015), which are linked to higher rates of students' internalizing and externalizing behaviors (O'Connor, Dearing, & Collins, 2011; Shi, Etkedal, Deutz, & Woltering, 2020). Taken together, this literature suggests that teacher perceptions of the school climate are correlated with teacher levels of stress and burnout. It is less clear, however, whether such teacher perceptions have relevance for children's externalizing and internalizing behaviors. Integrating these findings with the Prosocial Classroom Model, we expect that teachers' broader school climate perceptions, including their perceptions of colleagues' and administrators' support and instructional resources, would have precipitating effects on the development of children's externalizing and internalizing behaviors (Jennings & Greenberg, 2009).

#### *Current study*

This study used data from a large, nationally-representative dataset to examine how teacher psychological traits are linked to behavioral problems in kindergarten and first grade. Drawing on the idea that teachers with higher levels of self-efficacy and positive perceptions of their school climates are more likely to create prosocial classrooms that foster children's healthy behavior (Jennings & Greenberg, 2009), we first examined how kindergarten teacher self-efficacy and school climate perceptions were concurrently associated with their ratings of children's

externalizing and internalizing behavior problems in kindergarten utilizing multilevel regression analyses. Second, we explored whether there were prospective associations between kindergarten teacher self-efficacy and perceived school climate and children's externalizing and internalizing behaviors in first grade. We hypothesized that higher levels of both teacher self-efficacy and more positive school climate perceptions would be linearly associated with lower levels of externalizing and internalizing behavior concurrently in kindergarten (Hypothesis 1) and prospectively in first grade (Hypothesis 2).

We conducted longitudinal analyses to examine whether teacher characteristics in kindergarten were associated with changes in children's externalizing and internalizing behaviors from kindergarten to first grade. Assuming that teachers' characteristics in kindergarten set the stage for children's behavioral development, we hypothesized that higher kindergarten teacher self-efficacy and more positive perceived school climate would be linked to decreases in externalizing and internalizing behaviors from kindergarten to first grade (Hypothesis 3). We included children's executive function (EF) task performance during kindergarten as a control variable in our analyses, given that early EF performance is a robust predictor of externalizing behavior (Johnson et al., 2020; Schoemaker, Mulder, Deković, & Matthys, 2013), with growing evidence that it also predicts future internalizing behavior (Nelson et al., 2018; Wang & Zhou, 2019). We also incorporated several child socio-demographic characteristics (i.e., child's age, gender, race/ethnicity, and family income), as these factors have been shown to covary systematically with teacher ratings of children's externalizing and internalizing behavior (Heyman, Poulakos, Upshur, & Wenz-Gross, 2018; Mashburn et al., 2006). Finally, we conducted exploratory analyses utilizing cross-level interactions to examine whether links between teacher self-efficacy and children's externalizing and internalizing behaviors, and independently between perceived school climate and children's externalizing and internalizing behaviors, were moderated by children's EFs or externalizing and internalizing behaviors in kindergarten. These exploratory analyses were motivated by studies that have shown interactions between teacher and child characteristics, including greater benefits of teacher sensitivity, emotional, and instructional support for children with lower levels of self-regulation skills (Cadima et al., 2016; Choi et al., 2016; Connor et al., 2010).

## Method

### Data and sample

Data were drawn from The Early Childhood Longitudinal Study – Kindergarten Class of 2010–2011 (ECLS-K:2010), a nationally representative sample of 18,170 kindergarteners from approximately 1310 public and private schools collected by the National Center for Education Statistics within the Institute of Education Sciences (Tourangeau et al., 2015). Children participated in four waves of data collection. The first wave occurred in the fall of kindergarten in 2010, the second wave occurred in the spring of kindergarten in 2011, the third wave occurred in the fall of first grade in 2011, and fourth wave occurred in the spring of first grade in 2012. At all four time points, children completed direct assessments, and parents and teachers completed questionnaires. Here, we used data from the fall and spring of kindergarten (Waves 1 and 2) and the spring of first grade (Wave 4). Measures included EF scores and demographic covariates collected in the fall of kindergarten (Wave 1); teacher self-efficacy and perceived teacher school climate measured in the kindergarten spring teacher questionnaires (Wave 2); and teacher reports of student externalizing and internalizing behaviors from the spring of kindergarten (Wave 2) and first grade (Wave 4). Exclusionary criteria for data analysis included children without valid sample weights and those who repeated kindergarten. The sample for the current study included 14,810 children (51% male) nested within approximately 3130 kindergarten classrooms nested within approximately 1310 public and private schools.

As expected, approximately half of the sample identified as male (50.67%) and children were 67.03 months, on average, at kindergarten entry ( $SD = 3.99$  months, range = 44.81–78.25 months). The sample was socioeconomically and racially/ethnically diverse. The average annual household income was \$76,137, with significant variability across families ( $SD = \$75,945$ ; range = \$2500 - \$350,000). Nearly half of the children in the sample identified as white/Caucasian (48.74%), with approximately a quarter identifying as Hispanic/Latinx (24.47%), 13.03% as black or African American, 8.23% as Asian or Pacific Islander, and 5.52% as another race/ethnicity or multiracial.

## Measures

### Teacher self-efficacy

Teacher self-efficacy (i.e., a Level-2 independent variable) captured kindergarten teachers' attitudes about their effectiveness as a teacher and views about their ability to teach students who have behavioral difficulties in the classroom (assessed at Wave 2). Teachers responded to 14 statements (e.g., "If I try really hard, I can get through even to the most difficult or unmotivated students") on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The ECLS-K designed this measure based on the Teacher Efficacy Scale (Hoy & Woolfolk, 1993), such that some items are the same as the original measure, and others are conceptually similar but worded differently. A principal components analysis provided strong support for a unidimensional measure of teacher self-efficacy, and thus we created composite measure of teacher self-efficacy by averaging the 14 items ( $\alpha = 0.80$ ). All items for the teacher self-efficacy measure are provided in Appendix A.

### Teacher school climate perceptions

Kindergarten teacher's views on the school climate and school environment (Level-2 independent variable) were assessed at Wave 2 (based on Kim, Schwartz, Cappella, & Seidman, 2014). Teachers responded to 10 statements (e.g., "I feel accepted and respected as a colleague by most staff members") on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). We averaged the 10 items to create a composite measure of teachers' perceived school climate ( $\alpha = 0.82$ ). All items for the teacher school climate measure are provided in Appendix A.

### Student externalizing and internalizing behavior problems

An adapted version of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990) assessed children's externalizing and internalizing behavior (Level-1 dependent variables) in the spring of kindergarten (Wave 2) and the spring of first grade (Wave 4). Teachers rated students' externalizing and internalizing behavior on a 4-point Likert scale ranging from 0 (*never*) to 3 (*very often*), with higher scores representing higher frequency of these behaviors. The externalizing behavior scale (kindergarten  $\alpha = 0.79$ ; first grade  $\alpha = 0.78$ ) included five items assessing the frequency with which child argues, fights, gets angry, acts impulsively, and disturbs ongoing activities. The internalizing behavior scale (kindergarten  $\alpha = 0.88$ ; first grade  $\alpha = 0.89$ ) included four items assessing the presence of anxiety symptoms, loneliness, low self-esteem, and sadness.

### Student executive functions

In the fall of kindergarten (Wave 1), students' EFs (Level-1 covariate) were assessed by two direct assessments that measured cognitive flexibility and working memory domains of EF. Children's cognitive flexibility was measured using the picture card version of the Dimensional Change Card Sort task, a widely used and highly reliable measure of cognitive flexibility (Zelazo, 2006). In this task, children were asked to sort picture cards first by one dimension (i.e., color; six trials); then another dimension (i.e., shape; six trials). If the child correctly sorted four out of six cards according to the second dimension, they then

proceeded to the third stage when the sorting rule depended on the presence or absence of the black border on a card (i.e., border; six trials). Children received one point for each correct response, and no points for incorrect responses or skipped trials in the third stage. The final cognitive flexibility score ranged from 0 to 18, representing the number of accurate responses across the three stages.

Children's working memory was measured using the Numbers Reversed subtest of the Woodcock-Johnson III Tests of Cognitive Abilities (Woodcock, McGrew, & Mather, 2001). In this task, researchers asked children to repeat orally a spoken string of numbers in reverse order. Children were administered up to 30 items, beginning with 5 two-digit numbers and ending with 4 eight-digit numbers. The task ended when the child was incorrect for three consecutive number sequences or if they finished the task without error. As recommended by Tourangeau et al. (2015), the *W* score was used to measure children's working memory. The *W* score is a standardized, equal interval score that captures children's ability on the task. Following research demonstrating that EF is best measured as a unitary construct in early childhood (Brydges, Reid, Fox, & Anderson, 2012; Willoughby, Blair, Wirth, & Greenberg, 2012), we created an overall EF variable by standardizing and averaging children's cognitive flexibility and working memory scores.

*Demographic covariates*

All demographic covariates were assessed at Level-1 and drawn from Wave 1 (i.e., fall of kindergarten). Child age, child gender (1 = male), child race/ethnicity, and family income were controlled for in all models. Child race/ethnicity was coded as a set of four dummy variables (Black/African American, Hispanic/Latinx, Asian/Pacific Islander, and other/multi-racial), with White/Caucasian as the reference group. Income was calculated as the mid-point of each bracket (e.g., \$15,000 for \$10,000–\$19,999) and those who selected the highest bracket (\$200,000 or above) had their household income recoded as \$300,000.

*Analytic plan*

Associations between teacher self-efficacy, teacher perceived school climate, and children's externalizing and internalizing behavior were probed using multilevel regression models in Stata Version 15. All models used maximum likelihood estimators, included the spring kindergarten or spring first grade sampling weight (sampling weight variable W2C\_2P\_2TZ0 for kindergarten outcomes and sampling weight variable W4C\_4P\_4TZ0 for first grade outcomes), and controlled for child age, gender, race/ethnicity, and family income. All continuous variables were standardized (grand-mean centered) so that regression coefficients can be interpreted as effect sizes. Equations for all models are presented in Appendix B.

*Main models*

We estimated separate models for externalizing and internalizing behaviors to examine concurrent associations between teacher factors in kindergarten and outcomes in kindergarten (Hypothesis 1), prospective associations between teacher factors in kindergarten and outcomes in first grade (Hypothesis 2), and longitudinal associations between teacher factors in kindergarten and outcomes from kindergarten to first grade (Hypothesis 3). Concurrent and prospective associations between teacher self-efficacy, teacher perceived school climate, and children's externalizing and internalizing behaviors were probed using two-level multilevel regression models which account for the nesting of children (Level-1) within classrooms (Level-2) in Stata Version 15. We first explored the use of three-level models to account for clustering of teachers within schools. However, examination of the intraclass correlations for our outcome variables demonstrated that these were very small, ranging from 0.019 to 0.028. Thus, we decided to proceed with two-level models. Longitudinal associations between teacher self-efficacy, teacher perceived school climate, and change in children's

externalizing and internalizing behavior problems were probed using three-level models which account for the nesting of time points (Level-1) within children (Level-2) within classrooms (Level-3).

*Exploratory analyses and sensitivity checks*

We also conducted two sets of exploratory analyses to test whether links between teacher factors and children's outcomes were moderated by children's EFs at kindergarten entry and children's externalizing/internalizing behaviors in kindergarten. We first reported the random slopes variance estimate for EFs. Then, we regressed the random Level-1 slope for EFs on both teachers' perceived school climate and self-efficacy, to test whether the links between teacher factors and externalizing and internalizing behavior were stronger for students with lower EF scores using cross-level interactions. In our second set of exploratory analyses, we reported the random slopes variance estimate for externalizing/internalizing. Finally, we regressed the random Level-1 slope for externalizing/internalizing in kindergarten on both teachers' perceived school climate and self-efficacy, to test whether the links between teacher factors and externalizing and internalizing behavior were stronger for students with higher externalizing/internalizing scores in kindergarten using cross-level interactions.

Further, we conducted a sensitivity check by including cluster means of the Level-1 variables, as recommended by Antonakis, Bastardo, and Rönkkö (2021) to explore whether there is an endogeneity problem limiting directional interpretations of the data. We then used Wald tests to examine whether the cluster means should be retained in the models and found that the random effects assumption held across most models and the cluster means did not need to be retained.

*Missing data*

Missing data differed depending on the reporter and time point. For the Level-1 variables, it was nearly 0% on the covariate measures, 1% on the direct assessments of EF, approximately 9% for the spring of kindergarten measures, and approximately 25% for the spring of first grade measures (see Table 1). We ran Little (1988) missing completely at random (MCAR) test for all of the Level-1 variables,  $\chi^2(520) = 622.70, p = .001$ . This provides evidence that the missing data in the Level-1 variables were not missing completely at random under the significance level of  $\alpha = 0.05$ . Children who attrited from the study were younger ( $t = -12.15, p < .001$ ), more likely to be male ( $t = 2.79, p = .005$ ) and Black/African American ( $t = 5.61, p < .001$ ), less likely to be White/Caucasian ( $t = -4.61, p < .001$ ), had lower family income ( $t = -3.96, p < .001$ ), had higher kindergarten externalizing ( $t = 11.39, p < .001$ ) and internalizing ( $t = 6.41, p < .001$ ) scores, and had lower EF scores ( $t = -10.56, p < .001$ ) than those who did not attrit from the study. The dataset was missing 9.23% of the Level-2 variables (i.e., kindergarten teacher self-efficacy and kindergarten teacher perceived school climate). The weights chosen account for non-response in the

**Table 1**  
Descriptive statistics for all study variables.

Variable	Valid Student N	% Missing	Mean	SD	Range
Externalizing (K)	13,400	9.54%	1.63	0.64	1–4
Externalizing (1st)	10,980	25.88%	1.72	0.61	1–4
Internalizing (K)	13,370	9.74%	1.50	0.49	1–4
Internalizing (1st)	10,910	26.35%	1.53	0.50	1–4
Executive functions (K)	14,660	1.03%	0.00	0.81	–3.09–3.01
Perceived school climate	13,440	9.27%	3.96	0.54	1.8–5
Teacher self-efficacy	13,440	9.27%	4.15	0.39	2–5

*Note.* (K) = kindergarten, (1st) = first grade. All *N*s are rounded to the nearest ten.  
SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study – Kindergarten Cohort of 2010–2011 (ECLS-K:2010), Parent and Teacher Questionnaires, 2010–2012.

spring of kindergarten and spring of first grade, at the child, parent, and teacher levels (Tourangeau et al., 2015).

**Results**

*Descriptive statistics and bivariate correlations*

Descriptive statistics for all study variables are presented in Table 1. Bivariate correlations are presented in Table 2. As expected, teacher reports of externalizing and internalizing behavior were moderately correlated in both kindergarten and first grade, such that children who displayed more externalizing behaviors also displayed more internalizing behaviors. Externalizing behaviors in kindergarten were more highly correlated with externalizing behaviors in first grade, than internalizing behavior in kindergarten and first grade. EFs in kindergarten had a low, but significant, negative correlation with externalizing and internalizing behaviors at both time points, such that children with higher EFs displayed fewer externalizing and internalizing behaviors. Kindergarten teacher perceived school climate was negatively correlated with all measures of externalizing and internalizing behavior. Therefore, children whose kindergarten teachers had more positive perceptions of the school climate displayed fewer externalizing and internalizing behaviors. Kindergarten teachers' report of their self-efficacy was negatively correlated with externalizing behavior in both kindergarten and first grade and with internalizing problems in kindergarten only, such that children whose kindergarten teachers had a greater sense of self-efficacy displayed fewer behavior problems. Both teacher-perceived school climate and teacher self-efficacy were positively correlated with children's EFs in kindergarten. Therefore, children whose kindergarten teachers had more positive perceptions of the school climate and greater self-efficacy displayed stronger EF skills. Teacher perceived school climate and self-efficacy were moderately correlated with each other, suggesting that teachers who have more positive perceptions of the school climate also report greater self-efficacy.

Consistent with research on teacher reported measures (Alter, Walker, & Landers, 2013; Meyer, Stevenson, & Sonuga-Barke, 2017), there were also significant demographic differences in teacher report of behavior problems, children's directly-assessed EFs, and teachers' perceived school climate and self-efficacy. Teachers reported that boys were more likely to display externalizing behavior problems in both kindergarten and first grade compared to girls. Teachers reported that children from higher-income households were less likely to display

externalizing and internalizing behaviors compared to students from lower-income households. Further, teachers reported more positive school climates and greater self-efficacy in classrooms with children from higher-income households. There were multiple significant associations between child race/ethnicity and other study constructs. The most notable was that Black students were reported to have higher levels of externalizing behavior than students of other races.

*Multilevel regression analyses*

Intraclass correlations (ICCs) were calculated to determine the proportion of variance shared between individuals within the same classroom and school and represent the degree of nesting in the data. The school-level ICC was 0.020 for kindergarten externalizing behavior and 0.019 for kindergarten internalizing behavior, demonstrating very small clustering at the school-level. However, the ICC at the teacher-within-school level was 0.433 for kindergarten externalizing behavior and 0.494 for kindergarten internalizing behavior, suggesting significant clustering at the teacher-level. ICCs were relatively similar for children's first grade behavior problems. The school-level ICC was 0.022 for first grade externalizing behavior and 0.028 for first grade internalizing behavior. The ICC at the teacher-within-school level was 0.431 for first grade externalizing behavior and 0.448 for first grade internalizing behavior. This suggests that approximately 40% of the variance in children's externalizing and internalizing problems are at the teacher-level for students from the same school. Further, these estimates demonstrate that only 2 to 3% of the variance in children's externalizing and internalizing behaviors are explained by nesting at the school level.

*Multilevel regression analyses: Externalizing problems*

Table 3 presents the concurrent and prospective links between kindergarten teachers' school-level perceptions and children's externalizing behaviors across kindergarten and first grade. First, we examined concurrent links between teachers' perceived school climate and self-efficacy and students' externalizing behaviors in kindergarten. This model demonstrated that kindergarten teachers' more positive perceived school climate and greater self-efficacy each were independently and associated with students' lower externalizing behaviors in kindergarten, after controlling for children's EFs and demographic covariates.

Next, we examined prospective links between kindergarten teachers' perceived school climate and self-efficacy and students' externalizing behaviors in first grade. This model demonstrated that greater teacher self-efficacy was associated with lower externalizing behaviors,

**Table 2**  
Bivariate Correlations Among All Study Variables.

	1	2	3	4	5	6	7	8	9	10
<b>Child-Level Variables</b>										
1. Externalizing (K)	–									
2. Externalizing (1st)	0.59**	–								
3. Internalizing (K)	0.30**	0.11**	–							
4. Internalizing (1st)	0.17**	0.30**	0.28**	–						
<b>Teacher-Level Variables</b>										
5. Perceived school climate	–0.09**	–0.04**	–0.07**	–0.04**	–					
6. Self-efficacy	–0.07**	–0.06**	–0.06**	–0.02	0.41**	–				
<b>Covariates (Child-Level)</b>										
7. EFs	–0.13**	–0.11**	–0.12**	–0.13**	0.06**	0.03**	–			
8. Child age	–0.02*	–0.01	–0.03**	–0.02	0.00	–0.02	0.19**	–		
9. Male child	0.20**	0.20**	0.03**	0.04**	–0.02*	–0.01	–0.06**	0.05**	–	
10. Family income	–0.11**	–0.10**	–0.08**	–0.07**	0.10**	0.09**	0.22**	0.01	0.01	–
11. White	–0.03**	–0.02	0.00	0.01	0.10**	0.01	0.24**	0.11**	0.00	0.21**
12. Black	0.12**	0.14**	0.02*	0.04**	–0.07**	–0.02*	–0.13**	0.00	0.00	–0.15**
13. Hispanic/Latinx	–0.03**	–0.03**	0.01	–0.01	–0.06**	0.01	–0.22**	–0.07**	0.01	–0.21**
14. Asian/Pacific Islander	–0.07**	–0.08**	–0.06**	–0.06**	–0.01	–0.01	0.03**	–0.08**	–0.02*	0.09**
15. Other	0.02*	0.00	0.02*	0.02*	0.00	–0.01	0.04**	0.01	0.00	0.02*

Note. (K) = kindergarten, (1st) = first grade, EFs = executive functions. \*  $p < .05$ , \*\*  $p < .01$ .

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study – Kindergarten Cohort of 2010–2011 (ECLS-K:2010), Parent and Teacher Questionnaires, 2010–2012.

**Table 3**  
Multilevel Regression Analyses Predicting Children's Behavior Problems Concurrently and Prospectively.

	Externalizing				Internalizing			
	Concurrent (K)		Prospective (1st)		Concurrent (K)		Prospective (1st)	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
<b>Level-2 (Teacher)</b>								
Perceived school climate	-0.039	0.015*	-0.011	0.018	-0.044	0.017**	-0.038	0.018*
Self-efficacy	-0.058	0.015***	-0.048	0.017**	-0.038	0.018*	0.010	0.017
<b>Covariates</b>								
<b>Level-1 (Child)</b>								
Executive functions	-0.107	0.014***	-0.086	0.019***	-0.125	0.015***	-0.151	0.021***
Child age	-0.023	0.014	-0.018	0.018	-0.020	0.014	-0.006	0.019
Male child	0.364	0.026***	0.406	0.033***	0.065	0.024**	0.078	0.033*
Household income	-0.083	0.015***	-0.089	0.016***	-0.062	0.015***	-0.056	0.021**
Black/African American	0.232	0.070**	0.278	0.095**	0.091	0.059	0.070	0.085
Hispanic/Latinx	-0.117	0.047*	-0.112	0.055*	-0.106	0.049*	-0.084	0.062
Asian/Pacific Islander	-0.165	0.059**	-0.121	0.072	-0.212	0.054***	-0.308	0.071***
Other race/multi-racial	0.167	0.060**	0.054	0.081	0.106	0.065	0.059	0.083
<b>Random Parameters</b>								
SD of teacher (Level-2) intercept		0.710		0.737		0.779		0.771
SD of child (Level-1) residual		0.698		0.695		0.685		0.717
BIC		5,979,511		6,124,685		5,866,903		6,272,706
Level-1 R <sup>2</sup>		0.086		0.089		0.027		0.028
Number of free parameters		13		13		13		13

Note. K = kindergarten. All coefficients are standardized. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study – Kindergarten Cohort of 2010–2011 (ECLS-K:2010), Parent and Teacher Questionnaires, 2010–2012.

however, teacher's perceived school climate was not significantly associated with teacher report of students' externalizing behaviors, when controlling for children's EF and demographic covariates.

Third, we examined the longitudinal links between kindergarten teachers' perceived school climate and self-efficacy and changes in students' externalizing behaviors from kindergarten to first grade, as presented in Table 4. This three-level model accounted for the nesting of externalizing behaviors (two time points) within students, and students within classrooms. Teachers' more positive perceived school climate and greater self-efficacy were each uniquely associated with change in children's externalizing behaviors from kindergarten to first grade, such that more positive perceived school climate and greater self-efficacy were associated with decreases in externalizing behaviors from kindergarten to first grade.

*Multilevel regression analyses: Internalizing problems*

Table 3 examines the concurrent and prospective links between kindergarten teachers' school-level perceptions and children's internalizing behaviors across kindergarten and first grade utilizing the same modeling strategies as above. The concurrent model demonstrated that kindergarten teachers' more positive perceptions of school climate and greater self-efficacy each were independently associated with lower student externalizing behaviors in kindergarten, after controlling for children's EFs and demographic covariates. The prospective model demonstrated that teachers' more positive perceptions of school climate were associated with teacher report of fewer internalizing behaviors, however, teacher self-efficacy was not significantly associated with teacher report of students' internalizing behaviors, when controlling for children's EF and demographic covariates. The longitudinal model (presented in Table 4) demonstrated that teachers' more positive perceptions of school climate and greater self-efficacy were each uniquely associated with change in children's internalizing behaviors from kindergarten to first grade, such that more positive perceived school climate and greater self-efficacy were associated with decreases in internalizing behaviors from kindergarten to first grade.

**Table 4**  
Multilevel, Longitudinal Analyses Predicting Children's Externalizing and Internalizing Behavior Problems from Kindergarten to First Grade.

	Externalizing		Internalizing	
	$\beta$	SE	$\beta$	SE
<b>Level-3 (Teacher)</b>				
Perceived school climate	-0.053	0.015***	-0.036	0.017*
Self-efficacy	-0.042	0.015**	-0.037	0.018*
<b>Covariates</b>				
<b>Level-2 (Child)</b>				
Executive functions	-0.108	0.011***	-0.130	0.011***
Child age	-0.012	0.010	-0.008	0.010
Male child	0.368	0.021***	0.051	0.019**
Household income	-0.069	0.010***	-0.055	0.011***
Black/African American	0.254	0.048***	-0.016	0.046
Hispanic/Latinx	-0.131	0.029***	-0.131	0.030***
Asian/Pacific Islander	-0.177	0.037***	-0.249	0.036***
Other race/multi-racial	0.068	0.048	0.017	0.048
<b>Level-1 (Time)</b>				
Time point (1 = 1st grade)	0.038	0.014**	0.032	0.020
<b>Random Parameters</b>				
SD of teacher (Level-3) initial status		0.383		0.558
SD of teacher (Level-3) rate of change		0.712		0.969
SD of child (Level-2) initial status		0.792		0.721
Within-child SD (Level-1) residual		0.297		0.400
BIC		2,478,484		5,971,362
Number of free parameters		16		16

Note. K = kindergarten. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study – Kindergarten Cohort of 2010–2011 (ECLS-K:2010), Parent and Teacher Questionnaires, 2010–2012.

*Exploratory analyses*

To explore whether children who entered kindergarten with lower regulatory skills (as indexed by lower EFs and higher behavior

problems) were more sensitive to teacher self-efficacy and perceived school climate, we conducted a series of moderation analyses. The complete parameter estimates for these models are in Appendices C and D. First, we examined interactions between kindergarten teachers' perceived school climate, self-efficacy, and the Level-1 random slopes of students' EFs in kindergarten to predict students' externalizing problems in kindergarten. Results presented in Appendix C indicated that there was a significant interaction between students' EFs and teachers' self-efficacy for externalizing behaviors concurrently, such that greater teacher self-efficacy was more strongly linked to lower externalizing behaviors for students with *lower* EFs compared to students with higher EFs. There were no significant interactions between EFs and teachers' perceived school climate concurrently. Further, there were no significant interactions between either teachers' perceived school climate or self-efficacy and EFs for prospective associations with externalizing behaviors in first grade. Second, we examined interactions between kindergarten teachers' perceived school climate, self-efficacy, and students' EFs in kindergarten for students' internalizing behaviors. We found no significant interactions between students' EFs and teachers' perceived school climate or self-efficacy for internalizing behaviors concurrently or prospectively.

Finally, we examined whether the associations between kindergarten teacher's perceived school climate and self-efficacy and students' externalizing and internalizing behaviors in first grade were moderated by their kindergarten externalizing and internalizing behaviors, as shown in Appendix D. We found no significant cross-level interactions between students' externalizing behaviors in kindergarten and teachers' perceived school climate or self-efficacy for externalizing behaviors in first grade. Similarly, we found no significant cross-level interactions between students' internalizing behaviors in kindergarten and teachers' perceived school climate or self-efficacy for internalizing behaviors in first grade.

## Discussion

During the transition to formal schooling, children's internalizing and externalizing behaviors can impact their abilities to successfully learn in the classroom and positively interact with peers (Eisenberg et al., 2001; Okano et al., 2020). Children's teachers serve as key socializers for the development of early social-emotional skills during this important developmental period, such that teachers' personal characteristics may influence their interactions with students and the overall classroom climate with cascading effects on children's development (Jennings & Greenberg, 2009). Leveraging a large, nationally representative dataset, this study shows that teachers' self-efficacy and views of their school climates each contribute to teachers' ratings of students' externalizing and internalizing behaviors, independent of children's EFs, a well-established correlate of externalizing and internalizing behavior. Notably, these teacher characteristics each correlated with different dimensions of behavioral problems a year later. Specifically, kindergarten teachers' self-efficacy was prospectively associated with children's externalizing behavior problems in first grade while kindergarten teachers' perceived school climate was prospectively linked to children's internalizing problems in first grade. Finally, longitudinal models provided evidence that teachers' self-efficacy and school climate perceptions were uniquely related to changes in children's externalizing and internalizing behavior between kindergarten and first grade, such that more positive perceptions of climate and greater self-efficacy were linked to decreases in children's externalizing and internalizing behaviors from kindergarten to first grade. Our findings provide novel evidence that teachers' self-efficacy and school climate perceptions have persisting effects on children's externalizing and internalizing behaviors in early elementary school and underscore an urgent need to determine how best to support teacher well-being and self-efficacy to optimize children's social and emotional development in the classroom.

## Teacher-level factors and ratings of students' externalizing and internalizing behaviors

Over and above several well-established correlates of externalizing and internalizing problems, kindergarten teachers' own ratings of their teaching self-efficacy and school climate each showed unique, independent associations with their concurrent ratings of children's externalizing and internalizing behaviors. These findings, along with the significant variance at the teacher-level for ratings of behavioral problems, align with previous studies suggesting the importance of teachers' personal characteristics as a potential source of variance in their judgements of children's behavior (Alter et al., 2013; Mashburn et al., 2006). In particular, the results echo a study highlighting that teachers' self-efficacy and feelings of occupational burnout explained approximately one quarter of the between-teacher variance in ratings of children's socio-emotional behavior problems (McLean et al., 2019). Our findings also concur with those of O'Brennan et al. (2014), who found that teacher perceptions of the school climate contributed significantly to ratings of problem behavior even after accounting for student race, gender, academic achievement, and classroom-level student behavior problems. Overall, our work builds on a small number of extant studies indicating that teachers' personal characteristics are an important consideration in the assessment of children's problem behaviors cross-sectionally and provides new evidence that teachers' personal characteristics are linked to children's problem behaviors over and above EFs, an important predictor of externalizing and internalizing behaviors.

While our findings demonstrate associations between teacher characteristics and problem behavior ratings that are in line with the assumptions of the Prosocial Classroom Model and study Hypothesis 1, it is critical to note that several mechanisms may underlie these links. It is possible that our concurrent associations between teacher factors and children's behavior problems reflect common method variance, where those teachers who endorse lower values on measures of self-efficacy and more negative school climates also endorse more lower ratings on child behavior measures. That is, these teachers may have a more negative outlook that pervades their perceptions of their school environments, their self-efficacy, and their students' behaviors. Based on robust literature demonstrating that parental stress is linked to their ratings of children's behaviors (e.g., Lohaus, Rueth, & Vierhaus, 2020; Najman et al., 2000), a child may express average levels of behavior problems, but a teacher who is stressed and feels unsupported may overestimate the child's behavioral problems.

Associations may also reflect the impact of self-efficacy on teachers' management of children's behavior. Given their more effective management of students' behavioral problems, teachers with higher self-efficacy may be more likely to inspire appropriate behavior in students than those with lower efficacy, thereby reinforcing these effective practices and further enhancing their self-efficacy (Stipek, 2012). Conversely, teachers with lower self-efficacy tend to engage in more restrictive and authoritarian management strategies, which in turn may promote an escalation in children's behavioral difficulties (Almog & Shechtman, 2007). It is also important, however, to acknowledge studies demonstrating the reverse association of children's characteristics on teacher self-efficacy; both externalizing and internalizing behavior are associated with lower teacher self-efficacy specific to working with particular students (Geerlings et al., 2018; Schwab, 2019; Zee & de Bree, 2017). Thus, it is possible that associations are reciprocal. Relatedly, studies have demonstrated class- and school-based emotional 'contagion,' where stressors experienced by one individual contribute to collective stress in surrounding social spheres. For example, teacher reports of burnout correlate with student cortisol levels (Oberle & Schonert-Reichl, 2016) and students report lower levels of emotional distress when their teachers engage in effective emotion regulation strategies (Braun, Schonert-Reichl, & Roeser, 2020). When teachers perceive lackluster support and have low efficacy, these emotions may resonate through the class, with students showing associated increases in

dysregulated behavior.

Importantly, teacher self-efficacy and teachers' perceptions of their workplace environment each uniquely correlated with teachers' concurrent ratings of externalizing and internalizing behaviors in children. Thus, while these two teacher-level factors do overlap (Guo et al., 2010; Stipek, 2012), they also have independent value. Items on the self-efficacy scale generally reflected teachers' internal locus of control and sense of competence for responding to challenges, which affect children's learning within the immediate classroom setting. Items on the school climate scale, in contrast, tapped into the broader atmosphere of the school, including factors over which teachers may have less sense of control, such as administrative resources. It is unsurprising, then, that each of these factors has a unique bearing on problem behavior ratings, and that they may operate additively on children's behavior.

#### *Prospective associations between teacher factors and behavior problems*

In support of Hypothesis 2, we found prospective effects of kindergarten teacher self-efficacy and perceived school climate on children's behavioral problems in first grade. Importantly, these associations were independent of objective assessments of children's EFs. Previous studies have utilized cross-sectional designs to explore links between teacher characteristics and children's externalizing and internalizing problems (e.g., McLean et al., 2019; O'Brennan et al., 2014; Pas & Bradshaw, 2014), so our results provide the first evidence that these links persist even once children enter a new classroom. The prospective models provide a strong test of the impact of teacher characteristics on children's behavior because they are not subject to shared method variance. The predictor variables were measured in kindergarten, and children's outcomes (i.e., behavior problems) were reported one year later by a different teacher. It is possible that individual teachers' reports of their self-efficacy and perceived school climate may actually represent school-level constructs that impact all teachers within the school. If the school climate is positive and supportive, all teachers may perceive the work environment in this way and may also report higher self-efficacy in their abilities to teach and respond effectively to student behavioral concerns. However, the ICCs associated with teacher level effects in the longitudinal models were small, indicating that, in this instance, school-level effects are unlikely to be driving these associations.

We found that the prospective predictors of behavior problems differed for externalizing and internalizing behavior problems. Specifically, teacher self-efficacy in kindergarten was associated with children's externalizing behavior problems in first grade, whereas teachers' perceived school climate in kindergarten was associated with children's internalizing behavior problems in first grade. In this study, teacher self-efficacy measured teachers' beliefs in their abilities to effectively work with students who struggle behaviorally or academically. These qualities may be especially relevant for externalizing difficulties, where teachers may need to respond in a proactive way to overt challenges to authority, aggression, or hyperactive/inattentive symptoms.

In contrast, teachers' perceived climate scores captured general morale and the emotional tone of the school. Previous literature demonstrates that perceived school climate is linked to teacher stress and satisfaction (Ouellette et al., 2018), which are important for positive teacher-student interactions and the classroom emotional climate (Li Grining et al., 2010; Sandilos, Goble, Rimm-Kaufman, & Pianta, 2018). While few prior studies have focused on predictors of students' internalizing behavior problems, those that have emphasized the importance of warm and non-conflictual teacher-child relationships for children with internalizing problems (Baker, 2006; Rucinski, Brown, & Downer, 2018). It is plausible that in schools where teachers perceive an emotionally supportive school environment, they will be more likely to create a classroom environment that supports children with internalizing symptoms such as anxiety and sadness.

#### *Longitudinal associations between teacher factors and behavior problems*

Longitudinal models of the degree of change in children's externalizing and internalizing behaviors from kindergarten to first grade are the first to demonstrate that more positive teacher perceptions of school climate and greater self-efficacy were associated with decreases in both externalizing and internalizing behaviors. These findings underscore the critical importance of the kindergarten year for establishing children's longer-term trajectories. Both teacher and child characteristics in kindergarten may shape the profile of children's behavior by the end of the kindergarten year and this behavior may, in turn, set the trajectory for children's behavior and mental health as they progress through subsequent grades. The independent effect of children's EF at school entry on their first-grade internalizing, after accounting for earlier internalizing behavior and several other child characteristics, is particularly striking and adds to a growing literature suggesting that early EF represents a broad endophenotype of central importance for children's ongoing mental health (Nelson et al., 2018; Wang & Zhou, 2019).

Our models explained more variance in children's externalizing behaviors, compared to children's internalizing behaviors. Specifically, we accounted for approximately 9 % of the variance in children's externalizing behaviors in kindergarten and first grade, when controlling for demographic covariates, and EFs, whereas we explained less than 3 % of the variance in children's internalizing behaviors in the same models with rigorous controls. This provides further evidence of possible challenges with teacher report of internalizing behaviors, as compared to externalizing behaviors, which possibly are more disruptive and noticeable in a classroom context.

Our study also explored possible interactions of teacher-level factors with children's EFs and externalizing and internalizing behaviors. There was one significant interaction, demonstrating that the association between greater kindergarten teacher self-efficacy and lower externalizing behaviors in kindergarten was stronger for children with lower EFs. This provides possible evidence that greater teacher self-efficacy may buffer against the deleterious effects of low EFs for increases in children's externalizing behaviors. However, no other cross-level interactions were significant, highlighting that generally teacher self-efficacy and perceived school climate correlated with lower behavior problems for all children, regardless of their kindergarten self-regulation skills. These findings suggest that support of teachers' self-efficacy and improvements in central dimensions of school climate, including interactions among staff, expectations for student behavior, interactions with family, access to instructional resources, and teacher involvement in decision-making, will benefit all students in their classrooms.

#### *Strengths, limitations, and future directions*

The study has several strengths, including the use of a large, nationally representative dataset and longitudinal analyses that enabled us to examine the effects of teacher-self-efficacy and perceived school climate on children's externalizing and internalizing behaviors in elementary school over and above direct task-based assessment of child EF (rather than teacher or parent rating), demographic factors, and previous level of child behavior problems, both concurrently and prospectively. The findings from our study address calls for research linking teacher working conditions and perceived support with behavioral adjustment in children in the current climate of excess teacher burnout and turnover (e.g., Farley & Chamberlain, 2021).

However, there are some limitations that should be noted. First, it would be helpful in future studies to parse out different aspects of teachers' workplace well-being and climate perceptions, including their level of occupational burnout and stress associated with classroom demands; such an analysis would allow for a more thorough look at the specific workplace demands and climate dimensions that may impact teachers' ratings. Second, it is not possible to differentiate clearly whether the effects reflect a rater bias alone or whether teacher



variables influence teaching practices, which in turn influence children's behavior. Substantial research shows that teacher ratings of children's behavior are biased by child characteristics such as race, gender, and SES (Cullinan & Kauffman, 2005; Mason, Gunersel, & Ney, 2014; Meyer et al., 2017) and these same biases were evident in our study. Based on previous work showing that teachers' self-efficacy and well-being relate independently to teaching practices (Braun, Roeser, Mashburn, & Skinner, 2019; Justice et al., 2008; Klassen & Tze, 2014), we suspect that both mechanisms may be contributing factors. Unfortunately, teaching practices were not measured directly as part of the ECLS-K:2010, and a definitive answer to this question will require longitudinal studies that incorporate observational measures of teacher and child behavior in the classroom. Third, effect sizes for the variables of interest were relatively small, though on par with other educational interventions (Kraft, 2020). Children's social-emotional behaviors are strongly impacted by their home environments and other non-school experiences (Marcone, Affuso, & Borrone, 2020; Villarreal, Smith, & Nelson, 2022); future studies could explore the joint roles of teacher and parent stress for children's behavioral problems to better understand predictors of children's social-emotional development. Fourth, there are possible reciprocal effects between teacher well-being and students' behaviors. Random intercept cross-lagged panel models (e.g., Oh et al., 2020) would help elucidate whether teacher behavior is driving student behavior, or vice versa, or if true reciprocal effects exist. Finally, given the scope of the study, attrition was unavoidable. While we adjusted for missing data utilizing sample weights that accounted for non-response, we were not able to utilize multiple imputation due to issues with imputation model convergence. Therefore, if children or teachers non-randomly attrited from the study based on characteristics that were not empirically considered when creating the sample weights, our estimates could be biased and only generalizable to the sample of children and teachers which remained in the sample.

### Conclusions and implications

Current theoretical perspectives emphasize the importance of teachers' well-being for student's socio-emotional competencies in the classroom (Jennings & Greenberg, 2009). Our findings provide empirical evidence that teacher self-efficacy and perceived school climate are important contextual variables that deserve consideration in behavioral screening and intervention efforts, with persisting effects on children's externalizing and internalizing behaviors. Programs to support teacher well-being and self-efficacy may be beneficial, particularly those that focus on individualized support for increasing teachers' self-efficacy (Perera, Calkins, & Part, 2019). Interventions that promote school-wide positive behavioral support have also been shown to enhance both school organizational health and teacher self-efficacy (Kelm & McIntosh, 2012).

Further, applications of the Prosocial Classroom Model that a promote collaborative work environment in schools can be beneficial for teachers' and students' well-being (Jennings & Greenberg, 2009). One study showed that teachers who report better school climates, characterized by higher sense of community and teacher collaboration (Guo, Justice, Sawyer, & Tompkins, 2011), also report higher levels self-efficacy, emphasizing the need for promoting teacher collaboration in schools. Practical strategies recommended for increasing teacher collaboration often include taking time to connect with colleagues and getting to know their interests, establishing traditions, and celebrating accomplishments (Caskey & Carpenter, 2014). School administrators may encourage teachers to take an active role in creating supportive and collaborative work environments, given their importance for teachers' and students' outcomes. Overall, findings from the current study underscore the role of multiple ecological systems for children's behavior and suggest that efforts to support teachers' sense of a positive school environment and self-efficacy are likely to have cascading implications for children's healthy behavioral development.

### CRedit authorship contribution statement

**Jenna E. Finch:** Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing, Project administration, Supervision. **Kimia Akhavein:** Formal analysis, Writing – original draft, Writing – review & editing. **Irina Patwardhan:** Conceptualization, Methodology, Writing – review & editing, Funding acquisition. **Caron A.C. Clark:** Conceptualization, Writing – original draft, Writing – review & editing.

### Data availability

The authors do not have permission to share data.

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### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.appdev.2023.101512>.

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