

# School Psychology

## **Effects of a Universal Classroom Management Teacher Training Program on Elementary Children With Aggressive Behaviors**

Chi-ching Chuang, Wendy M. Reinke, and Keith C. Herman

Online First Publication, January 9, 2020. <http://dx.doi.org/10.1037/spq0000351>

### CITATION

Chuang, C.-c., Reinke, W. M., & Herman, K. C. (2020, January 9). Effects of a Universal Classroom Management Teacher Training Program on Elementary Children With Aggressive Behaviors. *School Psychology*. Advance online publication. <http://dx.doi.org/10.1037/spq0000351>

# Effects of a Universal Classroom Management Teacher Training Program on Elementary Children With Aggressive Behaviors

Chi-ching Chuang

Okinawa Institute of Science and Technology  
Graduate University

Wendy M. Reinke and Keith C. Herman

University of Missouri

The purpose of this study was to examine the treatment effects of the Incredible Years Teacher Classroom Management (IY TCM), a universal classroom management intervention, on the outcomes of children with aggressive behavior in elementary school. Classroom management has been demonstrated as a factor in either escalating children's aggressive behavior or decreasing those problematic behaviors. Participants included 1,817 students (Grade K to 3) and 105 teachers from nine elementary schools in a large urban Midwestern school district. Teachers were randomly assigned to receive IY TCM or to a wait-list comparison group. The hypotheses were that baseline levels of aggression would moderate the relationship between intervention status and outcomes. Findings indicated the hypothesized moderation effect on several outcome variables; specifically, children with baseline aggression problems who were in IY TCM classrooms had significantly improved math achievement, emotional regulation, prosocial behaviors, and observed aggression in comparison to similar peers in the control classrooms. Implications for practice and future research based on the findings are discussed.


## ***Impact and Implications***

The findings of this study extend the established universal effects of the Incredible Years Teacher Classroom Management to highlight particular benefits for children with aggressive behaviors. The positive outcomes included improved math achievement, prosocial behaviors emotional regulation, and reductions in observed aggression. Effective classroom management training for teachers may help alter the common negative developmental trajectories experienced by children with aggressive behaviors.

*Keywords:* classroom management, aggressive behavior, prevention, academic achievement

Childhood aggression without effective intervention has been linked to many adverse outcomes (Timmermans, van Lier, & Koot, 2009) including school failure, peer rejection, antisocial behaviors, substance abuse, higher rates of drop out from school, and other

negative mental health problems (Darney, Reinke, Herman, Stormont, & Ialongo, 2013; Farmer et al., 2003; Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006; Reinke, Herman, Petras, & Ialongo, 2008; Timmermans et al., 2009). Before entering school, young children use aggression to communicate their feelings or thoughts. This type of "instrumental aggression" does not usually persist unless it is maintained as a result of the interaction between the child and the environment. According to Patterson, Reid, and Dishion (1992), for those children who persist, the pathway to serious antisocial behavior begins for many in the toddler years when parents fail to teach their child to interact within a normal range of compliance. Parents and children develop coercive interactions that stem in part from a negative reinforcement pattern in which parents acquiesce to child requests and escalating demands. In turn, the parent uses harsh discipline practices when the child escalates to severe misbehavior. These first few years of life help to condition the child for future aggressive behaviors. The transition to elementary school represents a crucial developmental milestone for the child exhibiting aggressive behaviors. In elementary school, if teachers fail to establish effective discipline practices for these children, the coercive cycle seen in the home will be repeated in the classroom (Reinke & Herman, 2002).

 Chi-ching Chuang, Faculty Affairs Office, Okinawa Institute of Science and Technology Graduate University; Wendy M. Reinke and Keith C. Herman, Department of Educational, School and Counseling Psychology, University of Missouri.

The research was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A100342 to the University of Missouri (PI: Wendy M. Reinke). The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

We thank Francis Huang and Chia-chun Tsai for their consultation about the advance statistical analysis in this article.

Correspondence concerning this article should be addressed to Chi-ching Chuang, Faculty Affairs Office, Okinawa Institute of Science and Technology Graduate University, 1919-1 Tancha, Onna-son, Okinawa, Japan 904-0412. E-mail: [chiching.chuang@oist.jp](mailto:chiching.chuang@oist.jp)

Many interventions have been developed to effectively interrupt this coercive pattern and in turn, reduce childhood aggression (Hudley, Graham, & Taylor, 2007; Jones, Brown, Hoglund, & Aber, 2010). The majority of these interventions focus on individual or small group training, requiring that someone work with the targeted children directly. Although the effectiveness of these programs has been demonstrated (Hudley et al., 2007; Leflot, van Lier, Onghena, & Colpin, 2013; Powell et al., 2011), some limitations of these interventions have been noted, including the amount of time and the cost of directly intervening with these children, the potential stigma attached to individual or small group interventions, and the challenge for children to generalize new skills into the classroom. Therefore, effective prevention interventions that target the salient environments of children with aggressive behavior, such as classrooms, are likely to be more appropriate as they can minimize stigma and efficiently support the generalization of skills at low cost. Given that early elementary school years are critical for children to develop proper social skills and emotional competence, particularly for children with high levels of aggression, helping classroom teachers provide scaffolding to increase children's positive behaviors and minimize aggressive behaviors is crucial.

### Incredible Years Teacher Classroom Management Program

Incredible Years Teacher Classroom Management Program (IY TCM) is an evidence-based prevention program designed to train teachers in effective classroom management practices and in turn, reduce student disruptive and aggressive behaviors. IY TCM works with teachers to promote their competencies in classroom management and strengthen home-school connections in the following areas: (a) effective classroom management skills; (b) use of social and emotional coaching with students; (c) positive relationships between teachers and students; (d) use of effective discipline strategies; (e) collaboration with parents; (f) teach social skills, anger management and problem solving skills in the classroom; and (g) decrease the level of classroom aggression (for more information about the IY TCM content see <http://incredibleyears.com/program/teacher/classroom-mgt-curriculum>). The IY TCM has shown positive outcomes for children struggling with behavioral challenges but mostly when used in conjunction with other IY series interventions (Baker-Henningham, Walker, Powell, & Gardner, 2009; Carlson, Tiret, Bender, & Benson, 2011; Webster-Stratton, Jamila Reid, & Stoolmiller, 2008; more studies please refer to <http://www.incredibleyears.com/research-library/>). Recently, the IY TCM as a stand-alone intervention has demonstrated improved outcomes for children and teachers (Murray, Rabiner, Kuhn, Pan, & Sabet, 2018; Reinke, Herman, & Dong, 2018). For instance, our research team found that the IY TCM alone improved children's social emotional outcomes including prosocial and self-regulation skills (Reinke et al., 2018). On the other hand, IY TCM did not significantly impact two other outcome variables, student disruptive behaviors and concentration problems. In a separate study, Murray and colleagues (2018) found no main effects of IY TCM on student outcomes; however, they reported specific benefits for students with baseline social-behavioral difficulties.

In line with the Murray and colleagues (2018) findings, the present study examined whether IY TCM had particular benefit for

students with baseline aggressive behaviors. Although IY TCM is intended to be a universal intervention for all children in the classroom and findings from our prior study support this purpose (Reinke et al., 2018), the Murray and colleagues' findings suggest that IY TCM may be especially helpful for youth with preexisting behavior problems. Consistent with the Murray and colleagues' paper, prior studies have found that other universal preventive school and classroom behavior interventions (e.g., Positive Behavior Intervention Support, Good Behavior Game) have particular benefit for children with at-risk behaviors or social-emotional difficulties (Bradshaw, Waasdorp, & Leaf, 2015; Kellam et al., 2008). None of these prior studies, however, have examined whether universal preventive interventions are specifically helpful for youth with aggressive behaviors. To fill this void, the present study examined the effects of IY TCM on the academic and social-emotional outcomes for children with high levels of aggression. We hypothesized that baseline aggressive behaviors would moderate IY TCM treatment effects on social, emotional, and academic outcomes. Specifically, we predicted children with higher levels of baseline aggression who were in IY TCM classrooms would have greater improvements in end-of-year observed aggressive behavior, prosocial behavior, emotional regulation, and academic outcomes relative to aggressive students in the comparison group.

## Method

### Participants

The study included 105 teachers and 1,817 children (Kindergarten to third grade) from nine urban schools where served primary Black students. Teacher participants were recruited across 3 years (Year 1: 34 teachers, 577 students; Year 2: 34 teachers, 571 students; Year 3: 37 teachers, 670 students). Each cohort of teachers was randomized into the intervention (receiving IY TCM) or the wait-list group. The majority of teacher participants were female (97%) and White (75%). The average years of teaching experience were 11 with a standard deviation of 8. The student sample included more males (52%) and Black students (76%). Sixty-one percent of the student sample qualified for free or reduced lunch, and 9% of the sample received special education services.

### Measures

**Student demographics.** Free and reduced lunch status (FRL), student race, and sex were obtained from the school district for all participating students. Gender was coded 0 = male, 1 = female; race was coded 0 = White and Other, 1 = Black; free/reduced lunch (FRL) is coded 0 = not free or reduced and 1 = free or reduced.

**Teacher report of student behavior.** The Teacher Observation of Classroom Adaptation-Checklist (TOCA-C; Koth, Bradshaw, & Leaf, 2009) measures each child's level of "disruptive behavior" (nine items,  $\alpha = .92$ ), "concentration problems" (seven items,  $\alpha = .96$ ), "prosocial behaviors" (five items,  $\alpha = .92$ ), and "emotion dysregulation" (four items,  $\alpha = .89$ ) through teacher ratings. Teachers responded to each question using a 6-point Likert scale (1 = *never* to 6 = *almost always*). TOCA-C had accumulated

strong evidence in terms of validity and reliability (Koth et al., 2009; Wang et al., 2015). Teachers in the study completed TOCA-C before and after the implementation of IY-TCM. In this study, the prosocial behaviors and the emotion dysregulation subscales were included. The emotion dysregulation subscale assessed the frequency of children's problems in emotion regulation, meaning higher scores suggesting greater emotional dysregulation. Another subscale was derived to assess child aggression and is described below.

For the purposes of this study, a new scale consisting of six items from the TOCA-C was created to identify aggressive behaviors among children. The six items were selected because they cover children's physical aggression in the classrooms (*harms others, yells at others, fights, harms property, doesn't get along with others, and bullies others*), instead of general problem behaviors captured by the disruptive subscale. Some items on the Disruptive scale were not consistent with the construct of physical aggression (e.g., *lies*). The internal consistency of the aggression subscale in the TOCA-C from the current sample was high ( $\alpha = .89$ ). The aggression subscale also had high stability across two time points; the 6-month test-retest reliability equaled .75. Moreover, the aggression subscale had moderate and significant correlations with external criterion including office discipline referrals ( $r = .53$ ) and school suspensions ( $r = .47$ , both  $p < .01$ ).

**Direct observations of students.** Independent observers conducted direct observation of student aggressive behaviors using the Student Teacher Classroom Interaction Observation code (Reinke, Herman, & Newcomer, 2016). In the current study, observed aggression was included as an outcome variable. Observed aggression was operationalized as any physically or verbally aggressive behavior directed toward objects, peer(s) or the teacher. Aggressive behavior was recorded as a frequency count over a 5-min period and reported as a rate per minute of aggressive acts (for more details, please see Reinke et al., 2016). Before data collection, observers were trained for 2 weeks using videos and practice sessions to 85% reliability with a master coder. Reliability checks were conducted on 30% of observations, and observers received continuing supervision to ensure against observer drift. All observations (data collection) were conducted early in the school year (October) and near the end of the school year (April) during academic instruction delivered by the participated teachers. Each student was observed for 5 minutes. The Multi-Option Observation System for Experimental Studies (MOOSES; Tapp, 2004) interface for hand-held computers to gather real-time data was utilized in this study. The MOOSES program calculates reliability for each variable by determining a match between observers within a 5-s window. If a match was found, then an agreement for that variable was tallied. Variables that were not matched were tallied as disagreements. An agreement ratio was then reported for each variable (agreements divided by the sum of agreements plus disagreements  $\times 100\%$ ). The overall mean percentage agreement across raters for the first timepoint (October) was 88%, and 93% for the second time point (April). All the observers for outcome data collection were blind to intervention status.

**Academic achievement.** The Woodcock Johnson Achievement Battery, 3rd ed. (WJ-III ACH; Woodcock, McGrew, & Mather, 2007) is a standardized achievement battery with two parallel forms. The current study included two subscales, Broad Reading and Broad Math, to represent participants' academic

achievement. The composite standard scores for both subscales were obtained by using WJ-III computer scoring software. The WJ-III ACH is developed with strong psychometrics.

## Procedure

The study was approved by the University Institute Review Board and the participating school districts. Only teachers who gave consent and students who had parent consent and self-assent were included in this study. Baseline data were collected before the IY TCM training started by late October, and postdata were gathered at the end of the school year (April).

Teachers in the IY TCM group attended three training sessions of 2 days each, occurring in late October/November, December, and January/February. Teachers in the intervention group received IY TCM training from two certified IY TCM group leaders. The IY TCM intervention uses video-based modeling to demonstrate effective classroom management practice. Much of the IY TCM training sessions were devoted to watching video vignettes of teachers' daily practices (interacting with students, disciplining students' challenging behaviors, involving parents etc.) with guided follow-up discussions in pairs or large groups. Treatment fidelity and teachers use of IY TCM skills (including the frequency of teacher use of general praise statements, specific praise statements, and reprimands) was monitored by a group of trained independent observers at four time points across the school year (see fidelity design in Reinke, Herman, Stormont, Newcomer, & David, 2013; see fidelity check procedures and results in Reinke et al., 2018). All aspects of the IY TCM targeted skills and proactive strategies in the classroom improved after the IY TCM training. Teachers in the IY TCM groups demonstrated significantly more effective classroom management skills after receiving the intervention than preintervention (within group) than their counterparts in the control groups (between groups; Reinke et al., 2018). In addition, the mean percentage of interobserver agreement was 90% on the fidelity observations.

Teachers assigned to the control group maintained their business as usual practices. They were provided the IY TCM at the end of the research project. For more details about study design and implementation please see Reinke and colleagues (2018).

## Analytic Plan

A series of hierarchical linear regression analyses were conducted to test for main effects and the hypotheses that aggression would moderate the relationship between intervention status and the outcome variables. Following guidelines on testing moderator models outlined by Jaccard and Turrissi (2003), predictor variables were entered in the following order: (a) baseline measure for each outcome, aggression, FRL, race, gender, intervention status; and (b) Aggression  $\times$  Intervention interaction term. The observed aggression data were analyzed via a zero-inflated Poisson (ZIP) analysis because of excessive zeros in the dataset causing data overdispersion (Harrison, 2014; Kéry, 2015; Sano, Jeong, Acock, & Zvonkovic, 2005). The ZIP model treats the sample as two latent groups. One group was "always zero," which in this study would be children who never displayed aggression in the classroom, while the other group was "not always zero", which meant those children who show aggressive behaviors fitting the Poisson

distribution. All analyses were conducted using *M-plus 7.0* and standard errors were corrected to reflect that children were clustered within classrooms.

Missing data was observed on end-of-year outcomes mainly because students moved out of the district. The missing data rates in posttreatment phase across all outcome variables ranged from 6.4% to 7.3%. Analyses were conducted using full maximum estimation likelihood to account for missing data under an assumption that data were missing at random.

## Results

### Descriptive Results

The means and standard deviations for each predictor and dependent variables before and after intervention are presented in Table 1.

### Academic Achievement Outcomes

Results of the models examining the association between academic achievement, baseline aggression, intervention status, and three covariates (gender, FRL, and race) are presented in Table 2. Baseline reading achievement ( $b = .80, p < .001$ ), FRL ( $b = -1.51, p < .01$ ), and race ( $b = -1.02, p < .05$ ) significantly predicted reading achievement postintervention, indicating that children who received FRL, and who are Black demonstrated lower reading achievement postintervention in comparison to those who did not receive FRL and whose race was not Black. Regarding math achievement postintervention, baseline math achievement ( $b = .82, p < .001$ ), baseline aggression ( $b = -1.02, p < .01$ ), and race ( $b = -2.06, p < .01$ ) were significantly associated with math achievement at the end of school year, indicating that children who are Black, and children with higher levels of aggression at baseline demonstrated lower math achievement in comparison to those whose race was not Black and who showed lower levels of aggression at the end of school year. Baseline aggression was found to significantly moderate the intervention effects on children's math achievement ( $b = .01, p < .05, f^2 = .003$ ), but not reading achievement ( $b = .001, p = .638$ ). The simple slope for the Aggression  $\times$  Intervention interaction was significant for children with higher baseline aggression. Therefore, children with higher baseline aggression in the intervention group exhibited more improvement in math achievement at postintervention (see Figure 1).

### Social-Emotional Outcomes

Results of the models examining the association between social-emotional outcomes (emotional dysregulation, prosocial behavior, and observed aggressive behavior), baseline aggression, intervention status, and gender, FRL and race are presented in Tables 3 and 4. Results indicated that aggression at baseline ( $b = .45, p < .001$ ), baseline emotional dysregulation ( $b = .52, p < .001$ ), gender ( $b = -.18, p < .001$ ), and race ( $b = .14, p < .05$ ) were significantly associated with emotional dysregulation postintervention. The interaction between intervention status and baseline aggression moderated the main effect for children's emotional dysregulation postintervention ( $b = -.001, p < .001, f^2 = .005$ ). The simple slope was significant for children with higher levels of aggression whose teachers received the intervention. These children exhibited improvements in emotional regulation postintervention in comparison with those in the control group (see Figure 2).

Baseline prosocial behavior ( $b = .56, p < .001$ ), baseline aggression ( $b = -.41, p < .001$ ), and race ( $b = -.16, p < .001$ ) were associated with prosocial behavior postintervention, indicating that children with higher levels of baseline aggression and Black children had lower levels of prosocial behaviors postintervention. Similar to emotion dysregulation, a significant intervention by baseline interaction was found for prosocial behaviors postintervention ( $b = .01, p < .05, f^2 = .002$ ). The simple slope was significant for children with higher levels of aggression whose teachers were assigned to the intervention group. Thus, children with higher baseline aggression whose teachers were in the intervention group exhibited improved prosocial behaviors postintervention in comparison with those in the control group (see Figure 3).

Results of ZIP analysis showed a significant intervention by baseline aggression interaction on observed aggressive behaviors postintervention. The ZIP model included two parts. One is the logit model to determine the participants membership groups (non-aggressors vs. aggressors;  $b = -3.635, p < .05$ ), whereas the other model was a Poisson model to predict probability of count aggression ( $b = -4.092, p < .05$ ). Children with higher levels of baseline aggressive behaviors were more likely to be classified in the zero-aggression group and have reduced likelihood of observed aggression postintervention relative to comparable children in the control group.

## Discussion

We hypothesized that baseline aggressive behaviors would moderate the effects of a universal classroom management intervention, IY TCM, on student outcomes such that students with

Table 1  
Descriptive Information (*M* [*SD*]) for Study Variables

Variables	Intervention		Control	
	All ( <i>n</i> = 900)		All ( <i>n</i> = 917)	
	Pre	Post	Pre	Post
Reading	96.08 (13.52)	99.33 (12.95)	98.18 (13.13)	100.83 (13.35)
Math	93.76 (14.99)	96.66 (15.56)	95.14 (14.84)	97.29 (15.6)
Emotional dysregulation	2.31 (1.01)	2.15 (1.08)	2.30 (.95)	2.29 (1.07)
Prosocial behavior	4.51 (.98)	4.84 (1.04)	4.44 (.98)	4.67 (1.06)
Rate of observed aggression	.005 (.04)	.007 (.06)	.009 (.05)	.007 (.46)

Table 2  
Two-Way Interaction Regression Models Predicting Postintervention Academic Outcomes

Variable	Reading				Math			
	R <sup>2</sup>	R <sup>2</sup> Δ	b	SE	R <sup>2</sup>	R <sup>2</sup> Δ	b	SE
Step 1	.68	—			.635			
Intervention			-.02	.70			.29	.78
Aggression			-.63	.36			-1.02**	.35
Pretest			.80***	.018			.82***	.017
Gender			.72	.38			.30	.49
FRL			-1.51**	.55			.11	.70
Race			-1.02*	.44			-2.06**	.64
Step 2	moderation analysis							
Intervention × Aggression	.68	—	.001	.003	.636	.001***	.01*	.004

Note. Intervention is coded 1 = intervention; gender is coded 0 = male, 1 = female; race is coded 0 = White and other, 1 = Black; free/reduced lunch (FRL) is coded 0 = not free or reduced and 1 = free or reduced.  
\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

higher levels of aggression would benefit more from the intervention than similar students in the control condition. Findings indicated that children in the intervention group with higher levels of aggression at baseline as rated by classroom teachers showed better math achievement postintervention in comparison to aggressive peers in the control group. Thus, children in intervention classrooms demonstrated greater math improvements, after controlling for baseline math achievement, than their counterparts in the control group. It appears that by improving teacher classroom management, without providing direct interventions to individual children with aggressive behavior, math achievement improved. Given IY TCM’s focus on preventing problem behaviors by establishing clear expectations and providing high rates of positive interactions, teachers were likely able to minimize off-task and disruptive behaviors, which may have allowed them to devote

more time to deliver math instruction and for students to receive it. In line with this explanation, previous studies of IY TCM demonstrated improvements in students’ on-task behaviors and teacher-student relationships (Hutchings, Martin-Forbes, Daley, & Williams, 2013). The moderated effects on math achievement are encouraging and provide evidence for the effectiveness of a universal prevention which focuses primarily on the social-emotional learning climate rather than on particular instructional strategies.

Contrary to hypotheses, however, intervention effects on reading achievement were not moderated by baseline levels of aggression. Perhaps this null finding is related to the known association between reading difficulties and aggressive behavior. For instance, Miles and Stipek (2006) found that poor literacy achievement in early childhood predicted high levels of aggression in later childhood. Reading difficulties may be the foundational part of the

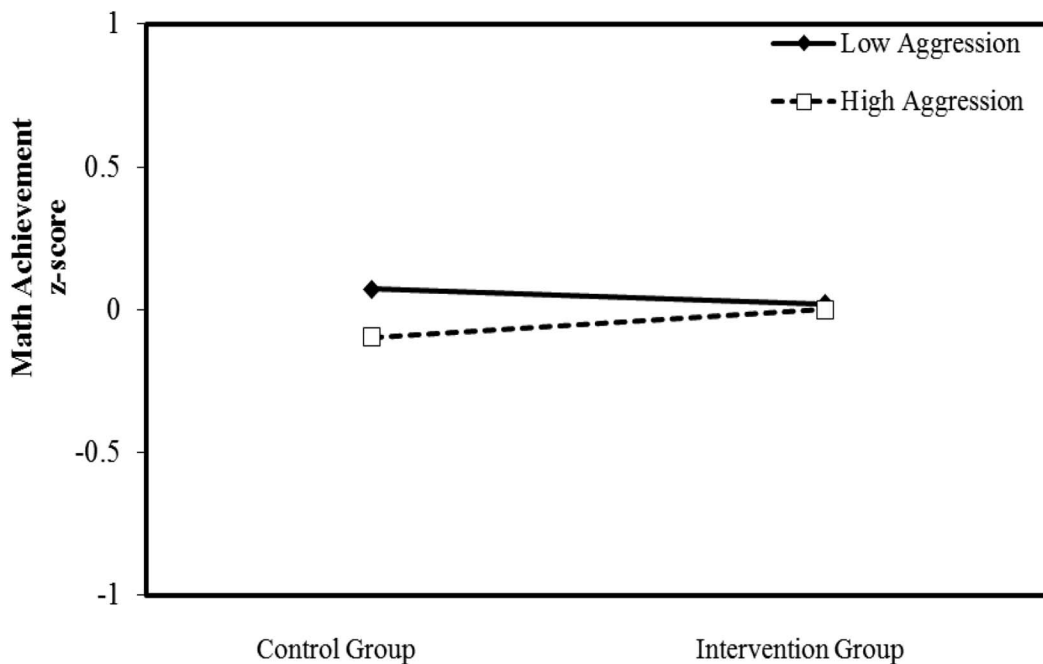


Figure 1. Two-way intervention status and levels of aggression predicting math achievement postintervention.

Table 3  
Two-Way Interaction Regression Model Predicting Postintervention Social-Emotional Outcomes

Variable	Emotional dysregulation				Prosocial behavior			
	R <sup>2</sup>	R <sup>2</sup> Δ	b	SE	R <sup>2</sup>	R <sup>2</sup> Δ	b	SE
Step 1	.559	—			.539	—		
Intervention			-.14	.05			.14	.07
Aggression			.45***	.06			-.41***	.05
Pretest			.52***	.04			.56***	.04
Gender			-.18***	.04			.08	.04
FRL			.03	.05			.04	.05
Race			.14*	.05			-.16***	.05
Step 2	moderation analysis							
Intervention × Aggression	.561	.002**	-.001**	.000	.54	.001***	.01*	.004

Note. Intervention is coded 1 = intervention, gender is coded 0 = male, 1 = female; race is coded 0 = White and other, 1 = Black; free/reduced lunch (FRL) is coded 0 = not free or reduced and 1 = free or reduced.  
\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

sequence contributing to aggressive behaviors and in turn, may require more targeted and tailored reading interventions rather than just more instructional time; therefore, addressing classroom management and improving teacher-student relationships may not be sufficient to ameliorate children's reading achievement problems.

The moderating effects of aggression on end-of-year social-emotional outcomes are consistent with previous IY TCM studies (Baker-Henningham et al., 2009; Hutchings et al., 2013; Murray et al., 2018). In this study, beginning of the school year aggression was found to moderate IY TCM's effects on end-of-year teacher-rated emotional regulation, prosocial behaviors, and observed aggression. In IY TCM, teachers are trained to address misbehaviors in the classroom by implementing effective classroom management and guiding social-emotional coping strategies. Children with aggressive behaviors appear to have benefited from the improved classroom environments and the targeted social-emotional coaching that occurs in IY TCM classrooms.

The current study expanded the previous findings of Reinke and colleagues' study (2018), suggesting more pronounced benefits of IY TCM for children with aggressive behaviors. The improvements in emotional regulation and prosocial skills suggest promise

for understanding how universal prevention interventions can impact students who display more challenging behaviors. That effects were found on direct observations of aggressive behaviors in the classroom is especially promising. Although the effect size was small, it was important to note that this observation was captured by a small slice (5-min observation) of student behaviors. Longer observations may reveal a more robust effect in future studies. Previous studies using IY TCM as the stand-alone intervention found significant reductions in children's negative attitudes or behaviors toward teachers (Baker-Henningham, 2011; Hutchings et al., 2007, 2013) and an increase of compliant behaviors in the classroom (Hutchings et al., 2007).

## Implications

The current study focused on the effects of IY TCM on the academic and social-emotional and behavioral performance of children with aggressive behavior. Findings support the selective effectiveness of a universal teacher classroom management intervention for aggressive youth. Thus, universal classroom management strategies may play a role in preventing students with aggressive behavior from developing further social behavior or academic problems. Preventive interventions are the first step toward ameliorating deficits in academic performance and social-emotional competence of children who struggle with externalizing behaviors. However, a need for additional supports to overcome current behavioral and academic challenges also may be warranted. By implementing universal prevention in our schools, fewer children will need additional supports and those that do will be easier to identify, helping to better utilize limited resources.

The findings also indicate the need for teacher training in effective classroom management. The lack of training in effective classroom training for teachers has received considerable attention. For example, 97% of teachers surveyed in Reinke, Stormont, Herman, Puri, and Goel (2011) study reported the urgent need to have additional training in classroom management (Reinke et al., 2011). Similar findings were found in another country—Northwest Wales, England—where teachers felt unprepared to face classroom challenges (Hutchings et al., 2007, 2013). As a result, Northwest Wales widely implemented IY TCM with success, and the local education authority agency promoted training IY TCM trainers to

Table 4  
Zero-Inflated Poisson Regression Model Predicting Postintervention Observed Aggression

Variable	Observed aggression	
	b	SE
Step 1		
Intervention	1.50	.67
Aggression	.92	.93
Pretest	-2.79	1.30*
Gender	-.50	1.04
FRL	-.74	1.10
Race	1.64	.48**
Step 2		
Intervention × Aggression	-4.09	1.75*

Note. Intervention is coded as 1 = intervention; gender is coded 0 = male, 1 = female; race is coded 0 = White and other, 1 = Black; free/reduced lunch (FRL) is coded 0 = not free or reduced and 1 = free or reduced.

\*  $p < .05$ . \*\*  $p < .01$ .

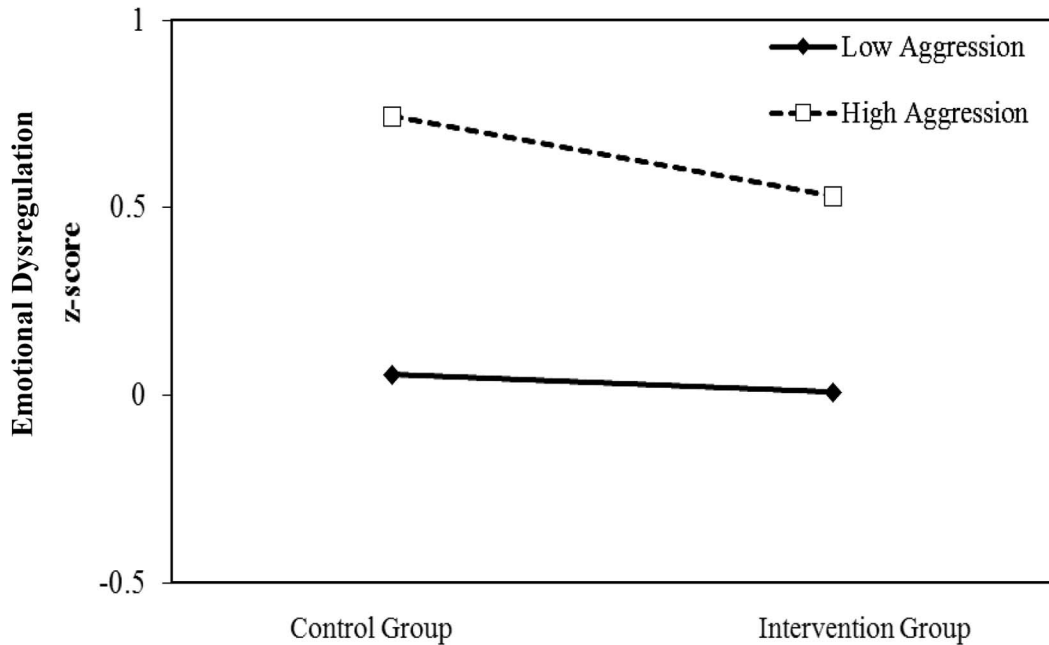


Figure 2. Two-way intervention status and levels of aggression predicting emotion dysregulation postintervention.

deliver training to more teachers (Hutchings et al., 2007). The present study underscores the importance of the dissemination of effective classroom management training for teachers to reverse negative trajectories for children with behavioral risk factors.

### Limitations

Although the findings were promising and the study was conducted in a rigorous manner, there were a few limitations. First, for the

purpose of this study, a subscale containing six items on the TOCA-C was created to define children's level of aggression. Although the scale had a high level of internal consistency and test-retest reliability and its validity was supported by moderate relations with school discipline variables, future studies are needed to fully evaluate the psychometric properties of this new subscale. In addition, although the effect sizes of the moderation analysis was modest as noted, we reduced the Type I error rate from multiple regression analyses using

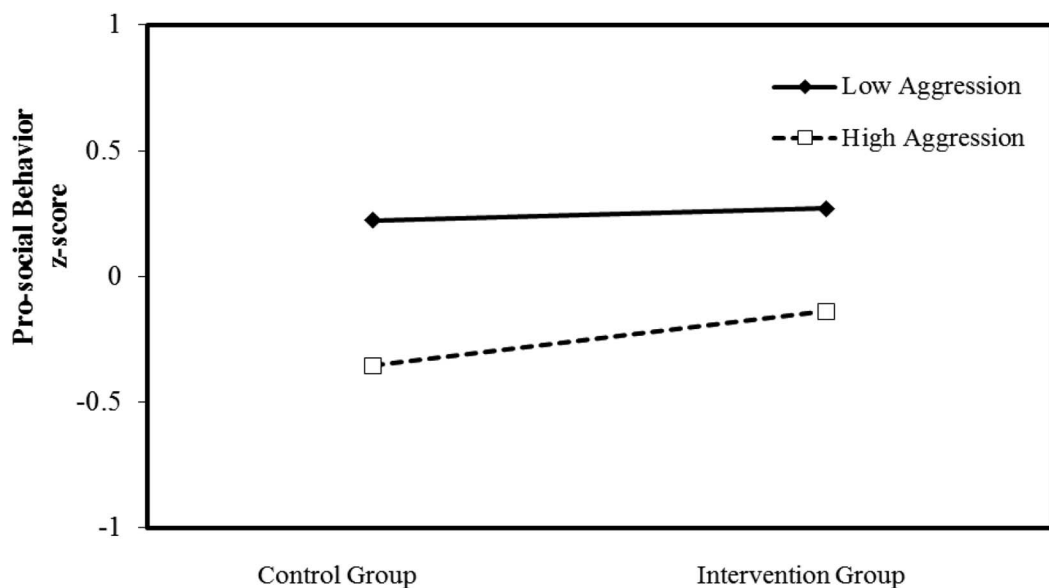


Figure 3. Two-way intervention status and levels of aggression predicting prosocial behavior postintervention.



a false recovery rate correction which may have come at the cost of reduced power to detect moderation effects.

For the positive effects on the social-emotional variables in this study reported by teachers, we cannot rule out the possibility of expectancy effects for teachers in the treatment group. However, the study also provided an objective outcome variable, direct observation of aggression, that revealed similar positive effects. Further, all teachers and students were from the same school district; therefore, the generalizability of the findings is likely to be limited. Moreover, some demographic information about the sample may present another barrier to generalize the results. The majority of teachers in the sample were White, and children were predominantly Black. Future research is needed to determine how well the findings generalize to other settings and populations.

Regarding the strength of effects, small effect sizes are common in moderation analysis of large sample studies. For example, the median observed effect size ( $f^2$ ) in a 30-year review was .002 (Aguinis, Beaty, Boik, & Pierce, 2005; Kenny, 2018), which was similar to the effect sizes observed in the present study. In addition, it is noteworthy in the present study that baseline aggression levels reported by classroom teachers were relatively low, reducing the likelihood of detecting the effects that are reported here.

### Future Directions for Research

This study used moderation analyses to determine the effects of IY TCM on children with higher levels of aggression. A more complete model examining the mechanism of a school-based intervention could also consider teacher variables such as rates of proactive behavioral strategies during instruction, teacher-student interactions, teacher's level of emotional exhaustion, and self-efficacy. Furthermore, moderation analyses can be potentially valuable toward determining what mechanisms may differentially impact different groups of individuals. Therefore, researchers may develop testable theoretical models of moderator effects, and of how mechanisms may vary by groups (mediated moderation). Similar perspectives have been stressed with regard to parenting intervention (Gardner, Hutchings, Bywater, & Whitaker, 2010).

Future research may also further explore the role of coaching with teachers to support IY TCM and behavior support plans with students with aggressive behavior. IY TCM coaches support teachers who received IY TCM workshop training and demonstrate effectiveness, especially for challenging behaviors from targeted students. Ongoing consultation and onsite direct coaching applying IY TCM principles appear to enhance effects. However, how extensive should these extended supports be and how much is sufficient? These questions have started to gain attention (Reinke et al., 2013, 2014) but more research is needed to optimize postintervention supports. Recently, increasing attention has focused on implementation fidelity of the IY TCM (Reinke et al., 2013; Webster-Stratton, Reinke, Herman, & Newcomer, 2011). Necessary ingredients of successful IY TCM implementation were training, mentoring, consultation and coaching. Each component could be a focus of more detailed research regarding delivery format, dosage, and length. Future research directions may also investigate the long-term effects of IY TCM by following up teachers with training and children in the intervention groups over several years.

### Conclusion

Aggressive behaviors and academic underachievement have an intertwined relationship that impacts children's success at school. The findings from the present study indicated that IY TCM, a universal prevention program, led to positive academic and behavior effects for children with higher levels of aggression. Therefore, supporting teachers and strengthening their use of effective classroom management provides another pathway toward decreasing behavioral and academic problems among an at-risk population of children.

### References

- Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: A 30-year review. *Journal of Applied Psychology, 90*, 94–107. <http://dx.doi.org/10.1037/0021-9010.90.1.94>
- Baker-Henningham, H. (2011). Transporting evidence-based interventions across cultures: Using focus groups with teachers and parents of preschool children to inform the implementation of the Incredible Years Teacher Training Programme in Jamaica. *Child: Care, Health and Development, 37*, 649–661. <http://dx.doi.org/10.1111/j.1365-2214.2011.01208.x>
- Baker-Henningham, H., Walker, S., Powell, C., & Gardner, J. M. (2009). A pilot study of the Incredible Years Teacher Training Programme and a curriculum unit on social emotional skills in community pre-schools in Jamaica. *Child: Care, Health and Development, 35*, 624–631. <http://dx.doi.org/10.1111/j.1365-2214.2009.00964.x>
- Bradshaw, C. P., Waasdorp, T., & Leaf, P. (2015). Examining the variation in the impact of school-wide positive behavior interventions and supports: Finding from a randomized controlled effectiveness trial. *Journal of Educational Psychology, 107*, 546–557. <http://dx.doi.org/10.1037/a0037630>
- Carlson, J. S., Tiret, H. B., Bender, S. L., & Benson, L. (2011). The influence of group training in the Incredible Years Teacher Classroom Management Program on preschool teachers' classroom management strategies. *Journal of Applied School Psychology, 27*, 134–154. <http://dx.doi.org/10.1080/15377903.2011.565277>
- Darney, D., Reinke, W. M., Herman, K. C., Stormont, M., & Ialongo, N. S. (2013). Children with co-occurring academic and behavior problems in first grade: Distal outcomes in twelfth grade. *Journal of School Psychology, 51*, 117–128. <http://dx.doi.org/10.1016/j.jsp.2012.09.005>
- Farmer, T. W., Estell, D. B., Leung, M. C., Trott, H., Bishop, J., & Cairns, B. D. (2003). Individual characteristics, early adolescent peer affiliations, and school dropout: An examination of aggressive and popular group types. *Journal of School Psychology, 41*, 217–232. [http://dx.doi.org/10.1016/S0022-4405\(03\)00046-3](http://dx.doi.org/10.1016/S0022-4405(03)00046-3)
- Gardner, F., Hutchings, J., Bywater, T., & Whitaker, C. (2010). Who benefits and how does it work? Moderators and mediators of outcome in an effectiveness trial of a parenting intervention. *Journal of Clinical Child and Adolescent Psychology, 39*, 568–580. <http://dx.doi.org/10.1080/15374416.2010.486315>
- Harrison, X. A. (2014). Using observation-level random effects to model overdispersion in count data in ecology and evolution. *PeerJ, 2*, e616. <http://dx.doi.org/10.7717/peerj.616>
- Hudley, C., Graham, S., & Taylor, A. (2007). Reducing aggressive behavior and increasing motivation in school: The evolution of an intervention to strengthen school adjustment. *Educational Psychologist, 42*, 251–260. <http://dx.doi.org/10.1080/00461520701621095>
- Hutchings, J., Daley, D., Jones, E. E., Martin, P., Bywater, T., & Gwyn, R. (2007). Early results from developing and researching the Webster-Stratton Incredible Years Teacher Classroom Management Training

- Programme in North West Wales. *Journal of Children's Services*, 2, 15–26. <http://dx.doi.org/10.1108/17466660200700023>
- Hutchings, J., Martin-Forbes, P., Daley, D., & Williams, M. E. (2013). A randomized controlled trial of the impact of a teacher classroom management program on the classroom behavior of children with and without behavior problems. *Journal of School Psychology*, 51, 571–585. <http://dx.doi.org/10.1016/j.jsp.2013.08.001>
- Jaccard, J., & Turrissi, R. (2003). *Quantitative applications in the social sciences: Interaction effects in multiple regression*. Thousand Oaks, CA: SAGE Publications Ltd. <http://dx.doi.org/10.4135/9781412984522>
- Jones, S. M., Brown, J. L., Hoglund, W. L. G., & Aber, J. L. (2010). A school-randomized clinical trial of an integrated social-emotional learning and literacy intervention: Impacts after 1 school year. *Journal of Consulting and Clinical Psychology*, 78, 829–842. <http://dx.doi.org/10.1037/a0021383>
- Kellam, S. G., Brown, C. H., Poduska, J. M., Ialongo, N. S., Wang, W., Toyinbo, P., . . . Wilcox, H. C. (2008). Effects of a universal classroom behavior management program in first and second grades on young adult behavioral, psychiatric, and social outcomes. *Drug and Alcohol Dependence*, 95(Suppl. 1), S5–S28. <http://dx.doi.org/10.1016/j.drugalcdep.2008.01.004>
- Kenny, D. (2018, September 18). *Moderation variables: Introduction*. Retrieved from <http://davidakenny.net/cm/moderation.htm>
- Kéry, M. (2015). *Overdispersion, zero-inflation, and offsets in the GLM. Introduction to WinBUGS for Ecologists: A Bayesian Approach to Regression, Anova, Mixed Models, and Related Analyses*. Burlington, MA: Elsevier Academic Press.
- Kokko, K., Tremblay, R. E., Lacourse, E., Nagin, D. S., & Vitaro, F. (2006). Trajectories of prosocial behavior and physical aggression in middle childhood: Links to adolescent school dropout and physical violence. *Journal of Research on Adolescence*, 16, 403–428. <http://dx.doi.org/10.1111/j.1532-7795.2006.00500.x>
- Koth, C. W., Bradshaw, C. P., & Leaf, P. J. (2009). Teacher observation of classroom adaptation-checklist: Development and factor structure. *Measurement and Evaluation in Counseling and Development*, 42, 15–30. <http://dx.doi.org/10.1177/0748175609333560>
- Leflot, G., van Lier, P. A. C., Onghena, P., & Colpin, H. (2013). The role of children's on-task behavior in the prevention of aggressive behavior development and peer rejection: A randomized controlled study of the Good Behavior Game in Belgian elementary classrooms. *Journal of School Psychology*, 51, 187–199. <http://dx.doi.org/10.1016/j.jsp.2012.12.006>
- Miles, S. B., & Stipek, D. (2006). Contemporaneous and longitudinal associations between social behavior and literacy achievement in a sample of low-income elementary school children. *Child Development*, 77, 103–117. <http://dx.doi.org/10.1111/j.1467-8624.2006.00859.x>
- Murray, D. W., Rabiner, D. L., Kuhn, L., Pan, Y., & Sabet, R. F. (2018). Investigating teacher and student effects of the Incredible Years Classroom Management Program in early elementary school. *Journal of School Psychology*, 67, 119–133. <http://dx.doi.org/10.1016/j.jsp.2017.10.004>
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys*. Eugene, OR: Castalia Pub. Co.
- Powell, N. P., Boxmeyer, C. L., Baden, R., Stromeyer, S., Minney, J. A., Mushtaq, A., & Lochman, J. E. (2011). Assessing and treating aggression and conduct problems in schools: Implications from the Coping Power Program. *Psychology in the Schools*, 48, 233–242. <http://dx.doi.org/10.1002/pits.20549>
- Reinke, W. M., & Herman, K. C. (2002). Creating school environments that deter antisocial behaviors in youth. *Psychology in the Schools*, 39, 549–559. <http://dx.doi.org/10.1002/pits.10048>
- Reinke, W. M., Herman, K. C., & Dong, N. (2018). The Incredible Years Teacher Classroom Management Program: Outcomes from a group randomized trial. *Prevention Science*, 19, 1043–1054. <http://dx.doi.org/10.1007/s11121-018-0932-3>
- Reinke, W. M., Herman, K. C., & Newcomer, L. (2016). The Brief Student-Teacher Interaction Observation: Using dynamic indicators of behaviors in the classroom to predict outcomes and inform practice. *Assessment for Effective Intervention*, 42, 32–42. <http://dx.doi.org/10.1177/1534508416641605>
- Reinke, W. M., Herman, K. C., Petras, H., & Ialongo, N. S. (2008). Empirically derived subtypes of child academic and behavior problems: Co-occurrence and distal outcomes. *Journal of Abnormal Child Psychology*, 36, 759–770. <http://dx.doi.org/10.1007/s10802-007-9208-2>
- Reinke, W. M., Herman, K. C., Stormont, M., Newcomer, L., & David, K. (2013). Illustrating the multiple facets and levels of fidelity of implementation to a teacher classroom management intervention. *Administration and Policy in Mental Health Services Research*, 40, 494–506. <http://dx.doi.org/10.1007/s10488-013-0496-2>
- Reinke, W. M., Stormont, M., Herman, K. C., Puri, R., & Goel, N. (2011). Supporting children's mental health in schools: Teacher perceptions of needs, roles, and barriers. *School Psychology Quarterly*, 26, 1–13. <http://dx.doi.org/10.1037/a0022714>
- Reinke, W. M., Stormont, M., Herman, K. C., Wang, Z., Newcomer, L., & King, K. (2014). Use of coaching and behavior support planning for students with disruptive behavior within a universal classroom management program. *Journal of Behavioral and Emotional Disorder*, 22, 74–82. <http://dx.doi.org/10.1177/1063426613519820>
- Sano, Y., Jeong, Y., Acock, A. C., & Zvonkovic, A. M. (2005, November). *Working with count data: Practical demonstration of Poisson, negative binomial and zero-inflated regression models*. Presented at the Special Session on Zero Inflated Modeling at the Theory Construction and Research Methodology, Phoenix, AZ.
- Tapp, J. (2004). *Multi-Option Observation System for Experimental Studies (MOOSES)*. Retrieved from <http://mooses.vueinnovations.com/licensing>
- Timmermans, M., van Lier, P. A. C., & Koot, H. M. (2009). Pathways of behavior problems from childhood to late adolescence leading to delinquency and academic underachievement. *Journal of Clinical Child and Adolescent Psychology*, 38, 630–638. <http://dx.doi.org/10.1080/15374410903103502>
- Wang, Z., Rohrer, D., Chuang, C., Fujiki, M., Herman, C. K., & Reinke, W. M. (2015). Five methods to score the teacher observation of classroom adaptation checklist and to examine group differences. *Journal of Experimental Education*, 83, 24–50. <http://dx.doi.org/10.1080/00220973.2013.876230>
- Webster-Stratton, C., Jamila Reid, M., & Stoolmiller, M. (2008). Preventing conduct problems and improving school readiness: Evaluation of the Incredible Years Teacher and Child Training Programs in high-risk schools. *Journal of Child Psychology and Psychiatry*, 49, 471–488. <http://dx.doi.org/10.1111/j.1469-7610.2007.01861.x>
- Webster-Stratton, C., Reinke, W. M., Herman, K. C., & Newcomer, L. L. (2011). The Incredible Years Teacher Classroom Management Training: The methods and principles that support fidelity of training delivery. *School Psychology Review*, 40, 509–529.
- Woodcock, R. W., McGrew, K. S., & Mather, N. (2007). *Woodcock-Johnson III Test of Achievement*. Rolling Meadows, IL: Riverside Publishing.

Received October 9, 2018

Revision received November 21, 2019

Accepted November 29, 2019 ■