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Focusing on teacher–student interactions eliminates the negative impact of students' disruptive behavior on teacher perceptions

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Abstract

This study tests the impact of a randomly assigned professional development coaching intervention (MyTeachingPartner-Secondary; MTP-S) on teacher projections of their students' educational attainment. Results indicate that students who report more behavior problems in the Fall of the academic year are projected by teachers to have lower future educational attainment in the Spring of the academic year. However, analyses further indicate that participation in the MTP-S intervention moderates the association between Fall student behavior problems and teachers' Spring projections for student attainment, such that this link is not significant for students in classrooms where the teacher is participating in MTP-S. In fact, results indicate that teachers who participate in the intervention project better educational attainment for their students than teachers who are in a business-as-usual control condition, regardless of their students' behavior. Findings are discussed in terms of the role that interventions targeting classroom interactions may play in altering teachers' internal view of students, thus ultimately promoting adolescent development.

Keywords

Adolescent development, behavior problems, high school, relationship quality, school environment, secondary school

The impact of teachers on students' development is vast, and is not limited to the content information they provide. The interactions a teacher creates, directly and indirectly, impact the academic and social development of their students. Key aspects of the teacher–student dynamic are the expectations the teacher has for the student. In the context of secondary school classrooms, there is strong evidence that teacher expectations, especially those relating to educational potential, are related to the future educational success after secondary school (Gregory & Huang, 2013). In addition, the presence of high expectations has been consistently linked to overall student engagement and higher satisfaction with school (Good, 1981; Klem & Connell, 2004; Marks, 2000).

It is also important to consider that these expectations do not operate in a vacuum. Students who exhibit problem behaviors in the beginning of the school year often evoke negative perceptions and expectations from teachers that they may struggle to change (Henriccson & Rydell, 2004; Murray & Zvoch, 2011). It is also important to highlight that teachers are not often given the proper support to understand the developmental context of their students, thus teachers often struggle to move past their students' disruptive behavior and engage in developmentally sensitive teaching. The current study highlights the impacts of a professional development program that focuses on increasing developmentally sensitive teaching interactions (MyTeachingPartner-Secondary; MTP-S; Allen, Pianta, Gregory, Mikami, & Lun, 2011). In particular, this study explores whether participation in MTP-S eliminates the negative impact of students' disruptive behavior on teacher perceptions of those students.

In the wake of the classic study by Rosenthal and Jacobson (1968) on the impact of teacher expectancy effects for shaping students' achievement, Brophy and Good (1974) contended that students tend to rise or fall to the level of expectations that their teachers have for them. This impact of creating a self-fulfilling prophecy may be linked to declines in student motivation and engagement, which may ultimately cause them to evoke further negative expectations from teachers. These initial assertions have been met with some criticism, most notably that this model is too simplistic and does not take into account that many teacher expectations reflect students' actual performance (Feather, 1982). However, there is evidence to suggest that teachers' expectations play an important role and may explain between 5% and 10% of the variance in students' achievement (Brophy, 1983; Raudenbush, 1984). Since this initial work, evidence has continued to suggest that the expectancies and perceptions that teachers have of their students precede changes in the performance of those students. For example, in a longitudinal sample of over 100 teachers and 2500 students, Jussim and Eccles (1992) found that teacher perceptions of their students independently predicted both future grades and standardized math performance after accounting for a myriad of controls. These studies point to the powerful impact that a teacher's perceptions of their students may have on their development.

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These dynamics are especially true in middle and high school classrooms. Studies capturing the transition to middle school and high school all indicate that students and independent observers report declines in teacher–student relationships as students get older, and these declines are linked to a pattern of declining student engagement (Marks, 2000; Reddy, Rhodes, & Mulhall, 2003; Skinner, Furrer, Marchand, & Kindermann, 2008). Teachers who maintain positive interactions with their students may be more likely to overcome this pitfall, but they often lack the rigorous and consistent support needed to meet this goal. Indeed, there is a wealth of research indicating that when teachers have higher beliefs about their students' potential, students have better future achievement (see Weinstein, 2002, for a review). This is due to processes, both explicit and implicit, by which teachers communicate their expectations to students and students maintain or adapt their motivation and engagement accordingly. Recent work continues to confirm the power of positive expectations, indicating that positive beliefs about a student's potential are beneficial regardless of a student's risk status (Sciarra & Ambrosino, 2011). In an ecological study of student, parent, and teacher expectations, results indicated that each individual expectation in 10th grade predicted postsecondary status 4 years later, but that teacher expectations were particularly protective for low-income students (Gregory & Huang, 2013).

The evocative impact that student behaviors play in shaping teacher perceptions is notable. Students who display elevated levels of behavioral and conduct problems in the classroom require a level of sensitivity and attention that often leads to negative perceptions and expectations from their teachers (Nurmi, 2012). There is ample evidence from pre-K and elementary school classrooms to suggest that students who display elevated levels of externalizing behavior elicit greater conflict with their teachers (Birch & Ladd, 1997; Doumen et al., 2008). While there is less research on the evocative impact of behavior problems for teacher perceptions of students' future educational success in the secondary school years, it is to follow a similar pattern (Wentzel, 2002). There is also a lack of research on this evocative impact on teacher projections. If teachers form expectations for their students in part on the behavior of those students in the beginning of the school year, then early displays of disruptive behavior from a student are likely to evoke the formation of a negative perception of that student, which is likely to shape educational and achievement expectations as well. The current study adds to the literature on the evocative impact of student behavior by examining the role of student disruptive behavior on subsequent teacher projections for students' educational attainment.

If positive teacher expectations are key to shaping teacher–student interactions, then a professional development program that helps teachers approach these interactions more sensitively with students is likely to have strong impacts. Unfortunately, there are very few programs that have been empirically shown to improve student achievement, much less teacher–student interactions. However, a recent teacher coaching program for secondary school teachers, MTP-S, has been empirically shown to improve teacher–student interactions, improve peer relationships in the classroom, reduce discipline referrals, and increase student achievement (Allen et al., 2011; Gregory, Allen, Mikami, Hafen, & Pianta, 2014; Mikami, Gregory, Allen, Pianta, & Lun, 2011). MTP-S uses the Classroom Assessment Scoring System-Secondary (CLASS-S) as a framework for guiding video-based interactions between teachers and a highly trained coach (see Allen et al., 2011, for a review). The goal of the program is to enhance the fit between teacher–student interactions and adolescents' developmental, intellectual, and social needs. This process occurs throughout an academic year so it also provides consistent support for teachers. MTP-S is structured around giving teachers the tools to place their students' behavior in context and treat all of their students in individualized ways.

Current Study

Although teacher perceptions of students are powerful indicators of students' future success (Gregory & Huang, 2013; Sciarra & Ambrosino, 2011), relatively few, if any, studies have looked to establish reliable predictors of variation in teachers' projections. The current study utilizes data from an existing randomized control trial of MTP-S to first establish if the disruptive behavior of students in the Fall of the school year serves as a predictor of these teacher projections in the Spring. We hypothesize that they do and that students who report more disruptive behavior in the Fall will evoke decreases in their teacher's projection of their future educational attainment from Fall to Spring (Hypothesis 1). We are also interested in identifying the impact of the MTP-S program on this process. Thus, we also hypothesize that participation in the MTP-S intervention will eliminate the evocative impact of students' disruptive behavior on teachers' projections (Hypothesis 2).

Method

Participants

This study included 86 secondary school teachers (30 male and 56 female) from five schools in the mid-Atlantic region of the United States who participated for two years in MTP-S. Teachers were randomly assigned to participate in either the intervention or regular in-service training. Participating teachers had an average of 9.4 years of teaching experience ($SD = 6.5$). Teacher racial/ethnic composition was 56% White, 33% African-American, 7% Mixed-ethnicity, 1% Asian, 1% Hispanic, and 2% other. Twenty percent of teachers had a terminal BA degree, and 80% had advanced education beyond the BA degree.

This study included 1195 secondary school students (570 male and 625 female). Student racial/ethnic composition was 58% African-American, 31% White, 9% Hispanic, and 2% Asian. Students in this study were primarily from high school (89%), with the remaining students in middle school (11%). Roughly 40% of the sample qualified for free/reduced lunch, an indication of family poverty. More information on recruitment of the sample and randomization can be found in Table 1.

Procedure and Intervention Process

Participating teachers provided written consent and study procedures were approved by a university institutional review board. Once teachers had consented and selected a focal course, parents of students in that course were invited to provide written consent and students were also asked to provide written assent to participate in the study. Teachers were then randomly assigned to the intervention or control group within each school.

MTP-S coaching intervention. At the outset of the study, both intervention and control group teachers participated in a 3-hour workshop prior to the beginning of the school year that explained the

Table 1. Demographics Characteristics and Achievement Test Scores by Intervention Versus Control Group.

	Intervention Mean (*SD*)	Control Mean (*SD*)	Significance of Group Differences *P*
Number of Years Teaching	10.2 (6.5)	8.6 (6.4)	.26
Average Class Size	22.5 (4.0)	21.7 (3.5)	.32
	N	*N*	
Student Gender	Male: 307	Male: 263	.39
	Female: 352	Female: 273	
Students' Family <200% of Poverty Line	Yes: 245 (37.2%)	Yes: 199	.99
	No: 414 (62.8%)	No: 336	
Teacher Gender	Male: 18 (40.9%)	Male: 13	.26
	Female: 26 (59.1%)	Female: 29	
Teacher has Master's or Higher Degree?	Yes: 36 (81.8%)	Yes: 33	.71
	No: 8 (18.2%)	No: 9	
Course Content	Math/Science: 23	Math/Science: 24	.65
	Engl/Soc. Stud.: 21	Engl/Soc. Stud.: 18	
School Level	Middle schl: 5 (11.4%)	Middle schl: 4 (9.5%)	.78
	High schl.: 39 (88.6%)	High schl.: 38 (90.5%)	

Note. Analyses used *t*-tests and chi-square analyses as appropriate.

evaluation protocol. During the workshop, all teachers were asked to select a ''focal class'' that they anticipated to be their most academically challenging class that also had standardized end-of-year achievement test assessments. Teachers were instructed in procedures to obtain student assent/parent consent and in the process of data collection.

Teachers in the MTP-S condition then continued for the remainder of the day in a workshop led by three master teachers who were trained in the CLASS-S (Hafen et al., in press; Pianta, Hamre, Hayes, Mintz, & LaParo, 2008) and who served as the primary teacher coaches responsible for implementing the intervention throughout the year. This part of the workshop outlined the principles of the MTP-S program, with a focus upon the theoretically specified dimensions of high-quality teacher–student interactions from the CLASS-S. Teachers and their coaches from the external intervention team discussed these dimensions and watched exemplar videos of teachers employing these principles. MTP-S teachers were also randomly assigned to one of the master teacher coaches who would work with them closely throughout the academic year.

The primary elements of the MTP-S intervention took place throughout the academic year. Coaches and MTP-S teachers participated in a carefully elaborated and manualized set of ongoing coaching cycles that revolved around review of video recordings of a teacher's classroom interactions, considered with reference to the CLASS-S dimensions (Pianta et al., 2008). Each of these coaching cycles began when MTP-S teachers video recorded a typical session in their focal course and mailed the video to the project office. Coaches selected brief (e.g., 1–2 minutes) video segments from the class of a particular teacher that were relevant to a specified CLASS-S dimension and posted it on a private webpage for that teacher. That teacher then logged in and was asked to observe their own behavior and student reactions, consider the connection between their behavior and student reactions, and respond to the coach's questions about that connection. This was followed by a 20–30 minute phone conference between the teacher and the coach to discuss instructional strategies that would enhance positive teacher–student relationships and the teacher's ability to sensitively engage all students.

The video segments chosen and the questions posed by the coach were intended to target and improve teacher–student interactions. The entire cycle (teacher videotapes, coach reviews, teacher reviews, both discuss together) was repeated approximately once every 6 weeks for the duration of the school year. At the start of the school year, the focus of these cycles began with dimensions concerning student–teacher relationships. Then as the year progressed, the cycles moved through dimensions focused on classroom organization and instructional support. MTP-S teachers were also directed by coaches in discussions to watch video exemplars of high-quality teaching (again, as defined by the CLASS-S) on the MTP-S website.

Measures

Student-reports of disruptive behavior. Students were asked to report on their disruptive behavior in the Fall of the academic year. This three-item scale assesses students' engagement in behaviors that disrupt or disturb the classroom, on a five-point scale ranging from 1 (Not at all true) to 5 (Very true). The scale has previously been found to have strong psychometric properties (Midgley et al., 2000) and links to student outcomes and motivation (Middleton & Midgley, 2002). Example item: ''I sometimes don't follow my teacher's directions during class.'' Reliability of this scale was high ($\alpha = .75$). Fall reports of disruptive behavior ($M = 1.46$, $SD = 0.75$) ranged from 1 to 5 with the majority of students reporting a 1 or a 2 and approximately 14% reporting a 3 or higher.

Teacher projections of student attainment. In the Fall and Spring of the academic year, teachers were asked to rate each of their students on the following item, ''How far in school do you expect/think this student will go?'' Responses were coded on a scale from 1 to 6 as follows: Less than high school graduation (1); High school graduation or GED only (2); Attend or complete 2-year college/school (3); Graduate from 4-year college/university (4); Obtain Master's degree or equivalent (5); and Obtain PhD, MD, or other advanced degree (6). This item is related to students' future academic success, suggesting evidence of predictive validity (Gregory

& Huang, 2013). Fall projections ($M = 2.46$, $SD = 0.75$) ranged from 1 to 5, while Spring projections ($M = 3.57$, $SD = 1.16$) ranged from 1 to 6.

Student, teacher, and classroom characteristics. School records were used to identify gender, race/ethnicity, and grade level of consented students. Due to the lack of teachers in middle school ($N = 9$), grade level was re-coded as 1 (Middle School) or 2 (High School) rather than coding for each individual grade. Records also indicated whether students came from low-income families (coded based on student eligibility for Free and Reduced Priced Lunch at school). Teachers reported on their gender, race/ethnicity, years of experience teaching, and education level on a questionnaire completed during the introductory workshop.

Sample Characteristics, Comparability, and Attrition Analyses

During initial spring recruitment, 97 teachers were selected to participate in the study. Of these, 86 completed the intervention year. Of the 11 teachers not available by the evaluation at the end of the intervention, virtually all attrition was a result of factors unrelated to program participation: three teachers had retired, three had moved out of the district, three were no longer teaching classes with end-of-year achievement tests, and two stopped participation prior to the Fall of the intervention year (thus not identifying a target class for the evaluation). Formal attrition analyses indicated no differences between teachers who did versus did not participate in the final evaluation in terms of teacher years of experience, gender, education level, or racial/ethnic minority status, nor was there any significant differential attrition by treatment group on any of these variables. Analyses were run using an intent-to-treat approach using FIML in MPlus 7 (Muthén & Muthén, 2012), albeit with some missing data, in which all teachers for whom outcome data were available are included in the analyses, including intervention teachers who may have participated only minimally in the core components of the intervention.

Results

Preliminary Analyses

Preliminary analyses considered the associations between student and teacher characteristics and all variables in the main analysis. Results of independent samples *t*-tests indicated that there were no differences between the MTP-S group and the control group on student and teacher characteristics, as would be expected based on the randomization process.

Main Analyses

Since each teacher was providing projections for multiple students' educational attainment, our main analyses were conducted in MPlus 7 (Muthén &Muthén, 2012) using two-level estimation. We ran analyses both with regular maximum likelihood (ML) estimation and with multiple linear regression (MLR) estimation, since Fall reports of disruptive behavior were positively skewed. Results were substantively similar, so the estimates we report are from ML estimation. We included grade level and student gender as covariates in all subsequent analyses due to findings in past work concerning disruptive behavior and teacher projections (Auwarter & Aruguete, 2008; Gregory & Huang, 2013). We also include Fall reports of teacher projections whenever predicting Spring reports, so that we can discuss relative increases or decreases. At the student level, the within-student correlation between the teachers' projection in the Fall and Spring was strong ($r = .66$, $p < .001$).

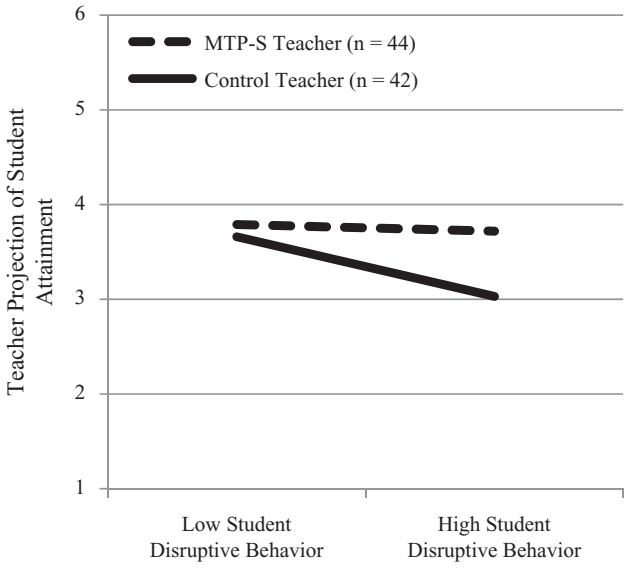

Figure 1. Teacher projections of their students' educational attainment in the Spring of the school year as a function of their students' level of disruptive behavior and their participation in a professional development program (MyTeachingPartner-Secondary; MTP-S).

Hypothesis 1: Students who report more disruptive behavior in the Fall will evoke decreases in their teacher's projection of their future educational attainment from Fall to Spring. This hypothesis was tested by examining a model in which we included student-reports of disruptive behavior in the Fall of the academic year as a predictor of their teacher's Spring projection of how far they will go in school, controlling for the teacher's Fall projection of that student. Results confirmed the hypothesis, as students who reported greater disruptive behavior in the Fall were significantly more likely to have worse educational attainment projections from their teacher in the Spring, $\beta = -.21$, 95% CI [–.33, –.09].

Hypothesis 2: Participation in the MTP-S intervention will eliminate the evocative impact of students' disruptive behavior on teachers' projections. This hypothesis was tested by adding a categorical teacher-level predictor for teachers' study condition (MTP-S or Control), as well as an interaction term (study condition × disruptive behavior). Results supported the hypothesis as there was a significant interaction, $\beta = .22$, 95% CI [.12, .32], indicating that teachers in the MTP-S intervention were less likely than control teachers to project poorer attainment for students who reported higher disruptive behavior in the Fall (see Figure 1). Further, study condition was a significant predictor of projected student attainment, $\beta = .29$, 95% CI [.19, .39], indicating that teachers who participated in MTP-S reported better projections for their students in the Spring ($M = 3.75$, $SD = 1.14$) than did control teachers

($M = 3.31$, $SD = 1.13$), yielding a standardized difference of $d = .39$ in the Spring.

Discussion

The findings of this study yield strong evidence for both the evocative impact of disruptive behavior on teacher projections, and the efficacy of professional development (MTP-S) grounded in developmentally sensitive teacher–student interactions. Given existing evidence suggesting that these projections are linked to concurrent and future school engagement and achievement (Gregory & Huang, 2013; Weinstein, 2002), this impact of MTP-S is particularly important. It indicates that the view teachers have of their students is malleable and a focus on increasing developmentally sensitive interactions in the classroom through a relatively low-cost intervention can be impactful.

The finding that disruptive student behavior early in the school year leads teachers to project those students to have lower educational attainment provides further evidence for the ways in which students impact their educational setting. This pattern of students with problem behaviors evoking more conflict and less supportive interactions from teachers is well established in the elementary school literature (Birch & Ladd, 1997; Silver et al., 2005). The consistency across grades is troublesome, as children who exhibit behavior problems during early school years, without intervention, may be placed on a developmental trajectory for continuing behavioral issues, declining engagement in school, and ultimately greater delinquent behavior (Myers & Pianta, 2008; Wang, Brinkworth, & Eccles, 2013). This pathway is exacerbated when combined with research in parent–adolescent settings detailing how adolescents with externalizing problems elicit declines in their relationships with parents (Hafen & Laursen, 2009; Stattin & Kerr, 2000). It also emphasizes the importance of the teacher–student relationship in secondary school classrooms, which is an aspect of teacher training and support that is often ignored for teachers in middle and high school instruction. Fortunately, the current study also offers evidence that the evocative impact of disruptive behavior may be removed if teachers receive professional support in understanding the developmental context of their students.

Understanding why a professional development program (MTP-S) might reduce evocative impacts in the classroom is vital. There is mounting evidence that the positive impact of MTP-S, including improving student engagement and student achievement (Allen et al., 2011; What Works Clearinghouse, 2012) and reducing discipline referrals (Gregory et al., 2014), may be a function of teachers learning how to setup the classroom to meet their students' needs. In fact, the core focus of MTP-S is to increase the ability of teachers to adapt their classroom environment to better suit the social-emotional and academic needs of their students. It seems likely that this process also involves a level of reflection and intentionality that would alter the process of forming and adapting perceptions about students. The ability to place their students' behavior in an appropriate developmental context and develop ways to restructure the classroom to better suit that context is a likely explanation for why MTP-S teachers did not demonstrate the evocative impact of disruptive behavior. As Figure 1 clearly demonstrates, not only were teachers participating in MTP-S more likely to report higher attainment projections for their students overall, but they were just as likely to report high projections for students with disruptive behavior as for those without evidence of disruptive behavior.

Future work into understanding the process by which teachers' participation in MTP-S transforms the way they view their students will yield vital insight into how malleable teacher perceptions can be. In addition, researchers may want to consider the best way to utilize observational systems to better understand the context of the secondary school classroom. Experimental work in which teachers are shown video of students in a classroom setting and asked to come up with perceptions of those students might help to unpack this process further. For instance, this would provide a context to learn if the evocative impacts of disruptive behavior are limited to persona interactions or if teachers are wired to expect less from students who display behavior problems. What is clear is that the formation of teacher perceptions deserves continued research, as they offer additional insight into the process through which students impact the educational setting.

Several limitations are worthy of note. Firstly, we only sampled students in one academic year. While the longitudinal nature allowed for the collection of data at different time points, we cannot speak to a pattern for students across years. We also do not have information about their long-term outcomes in school, so the impact of the teacher projections on grades and actual attainment is unknown. Secondly, as it relates to the intervention, although there was no evidence of selective attrition or sample differences impacting validity, we cannot rule out the potential of unmeasured biases. Future implementations of MTP-S in different contexts would provide additional evidence as to the consistency in the pattern of effects described in this study. Finally, we used a measure of teacher expectations that was only a single item, leaving us unable to test reliability and unsure of possible measurement error. However, given that we controlled for Fall projections and that we were still able to detect expected intervention group differences and associations with student disruptive behavior, it is unlikely that this error impacted our findings substantially. More nuanced measures of teacher projections in future research would significantly contribute to the literature.

The findings of this study tie together the evocative impact of student disruptive behavior, teacher projections of students' educational attainment, and the promise of professional development (MTP-S) that is focused on developmentally sensitive teaching. Specifically, this is the first study to indicate a professional development program with the ability to alter the evocative impacts of students. In this case, the typically negative impact that disruptive behavior had on teachers' perception of their students was eliminated for teachers receiving professional development grounded in developmentally appropriate teacher–student interactions. Understanding whether this impact might translate to other contexts (e.g., parent–adolescent relationships) may yield important implications for future intervention work.

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