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Improving Teacher Perceptions of Parent Involvement Patterns: Findings From a Group Randomized Trial

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For children with the most serious and persistent academic and behavior problems, parent involvement in education, particularly teacher perceptions of involvement, is essential to avert their expected long-term negative outcomes. Despite the widespread interest in and perceived importance of parent involvement in education, however, few experimental studies have evaluated programs and practices to promote it. In this group randomized trial, we examined the effects of the Incredible Years Teacher Classroom Management program (IY TCM) on teacher perceptions of contact and comfort with parents. One hundred five classrooms with 1818 students were randomly assigned to an IY TCM or to a control, business as usual condition. Measures of key constructs included teacher ratings of parent and student behaviors, direct observations in the classroom, and a standardized academic achievement test. Latent transition analysis (LTA) was used to identify patterns of involvement over time and to determine if intervention condition predicted postintervention patterns and transitions. Four patterns of involvement were identified at baseline and at follow-up; parents of students with academic and behavior problems were most likely to be in classes with the least adaptive involvement patterns. Intervention status predicted group membership at follow-up. Specifically, intervention classroom parents were significantly more likely to transition to more adaptive teacher-rated parenting profiles at follow-up compared to control classroom parents. This is the first randomized trial we are aware of that has found that teacher training can alter teacher perceptions of parent involvement patterns. Clinical implications for students with behavior and academic problems are discussed.

Keywords: parent involvement, teacher–parent relationships, student outcomes, LTA

Supplemental materials: http://dx.doi.org/10.1037/spq0000169.supp

For students with the most serious and persistent academic and behavior problems, parent involvement is essential to avert their expected long-term negative outcomes (Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). Although the pathway to serious antisocial behavior and academic failure is often set in motion by coercive parent–child interactions, the transition to elementary school represents a crucial developmental opportunity for interrupting the negative cascade of social and academic outcomes that typically occurs for these children (Patterson, Reid, & Dishion, 1992). Children at high risk for antisocial behavior often develop poor relations with teachers and receive less support and instruction and more criticism in the classroom (Arnold, Griffith, Ortiz, & Stowe, 1998; Campbell & Ewing, 1990; Carr, Taylor, & Robinson, 1991). In turn, these children are often rejected by their teachers and well-adjusted peers over the course of elementary school and fail to develop the "survival skills" necessary for academic and social success (Kellam, Rebok, Ialongo, & Mayer, 1994). Eventually, according to Patterson et al. (1992), these children are likely to drift into a deviant peer group where

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antisocial behavior and academic failure are reinforced.

Teachers of students with severe behavior and academic problems often develop negative perceptions not only of the students but also of their families (Stormont, Herman, Reinke, David, & Goel, 2013). Teacher perceptions are especially important given that teacher beliefs about parents, regardless of their accuracy, may influence their interactions with parents and their children (Henderson & Berla, 1997; McCoach et al., 2010; McDermott & Rothenberg, 2000). For instance, it is likely that teachers interact differently with parents whom they perceive as committed and interested in their child's education compared with parents whom they perceive as less involved in learning (Henderson & Berla, 1997; McDermott & Rothenberg, 2000). These perceptions in turn influence parents' ability, willingness, and motivation to participate in education (see Herman et al., 2012). Not surprisingly, families from disadvantaged backgrounds and those with children with the highest service needs have the lowest level of school participation (El Nokali, Bachman, & Votruba-Drzal, 2010; Park, Pullis, Reilly, & Townsend, 1994).

Teacher Perceptions of Parent Involvement

Teacher perceptions of parent involvement patterns have been found to be especially important predictors of student outcomes (Bakker, Denessen, & Brus-Laeven, 2007; Barnard, 2004). For instance, using a sample of 1,165 students from the Chicago Longitudinal study, Barnard (2004) found that only teacher ratings of parent involvement in elementary school predicted student outcomes in high school. Controlling for background characteristics, elementary students of higher versus lower participating parents were less likely to drop out and more likely to graduate from high school. Specifically, students whose parents were rated by teachers as having average or better participation for three or more years were 96% more likely to graduate from high school than students of parents never rated as having average or better participation. Parent ratings of their own involvement were largely unrelated to student outcomes in high school. Bakker et al. (2007) reported similar findings about the predictive power of teacher versus parent perceptions of involvement in an elementary sample from the Netherlands. Other authors have found teacher perceptions of parent involvement in early grades predict student achievement in later elementary school (Izzo et al., 1999) and reading achievement, grade retention, and special education status in eighth grade (Miedel & Reynolds, 2000), even after controlling for a host of known correlates of academic success.

Teacher ratings of parent involvement commonly focus on the amount of contact parents have with school personnel (e.g., attending meetings, volunteering, and visiting the school). A second equally important aspect of teacher perceptions is their comfort with parents (Miller-Johnson & Maumary-Gremaud, 1995). Comfort, sometimes called "bonding" or "alliance," refers to the quality of the relationship, not just the frequency of contact. In particular, teacher comfort with parents includes how aligned the teacher perceives the parent's goals and values to be with his or her own (Miller-Johnson & Maumary-Gremaud, 1995).

Although most studies have examined levels of contact or comfort separately as individual variables, their co-occurrence may provide even more important information about relationship patterns (McCoach et al., 2010). For instance, some parents may be characterized as having low contact with schools but still be perceived as having a comfortable relationship. In fact, a recent study (Stormont et al., 2013) found this pattern of teacher-rated parent involvement to be associated with the most favorable student outcomes. On the other hand, some parents may have frequent contact with teachers but be perceived as intrusive and unhelpful. Thus, it is the combination of contact and comfort, not either in isolation, that may determine how adaptive they are. Two recent studies have found that teacher perceptions of the combination of these two dimensions of contact and comfort are strong correlates of student success (McCoach et al., 2010; Stormont et al., 2013). For instance, Stormont et al. (2013) found three profiles of teacher-rated contact and comfort: high contact and comfort, low contact/high comfort, and low contact and comfort. Students in the latter group had significantly higher levels of behavior problems at school and lower levels of academic achievement.

Pathways Between Parent Involvement and Student Outcomes

What are the mechanisms by which teacher perceptions of parent contact and comfort influence student outcomes? First, teacher bias may undermine parent willingness and ability to support their child's educational achievement and social development. Much research has documented that parents are unlikely to seek services through schools or mental health providers when they feel judged (McKay, Atkins, Hawkins, Brown, & Lynn, 2003; Nock & Kazdin, 2001). Biases and negative perceptions of school staff may also make schools unwelcoming to parents and will likely influence both contact and comfort levels (Stormshak et al., 2005). The parents of students with behavior and/or academic problems and from culturally diverse backgrounds tend to have the lowest levels of school involvement (El Nokali et al., 2010; Park, Pullis, Reilly, & Townsend, 1994) which may contribute to a cycle of underachievement for these students.

A second, complementary mechanism of parent involvement may be through its impact on teacher and student interactions. In a longitudinal study with 443 1st-grade students, Hughes and Kwok (2007) found that teacher perceptions of parent involvement (a latent factor composed of both contact and alliance) mediated the effects of student background characteristics (race, gender) on student engagement; engagement in turn mediated the effects of teacher-perceived involvement on student academic achievement. Thus, teacher perceptions of both dimensions of involvement may directly influence student engagement in learning which contributes to student performance. A study with 894 3rd-grade students also found that parent involvement predicted quality of student–teacher interactions (Wyrick & Rudasill, 2009), suggesting a plausible additional link in the pathway to student outcomes. That is, positive teacher perceptions of parent involvement may lead to improved teacher-student interactions and higher levels of student engagement, both of which contribute to better student behaviors and academic performance.

These findings suggest that altering teacher perceptions of parent involvement patterns, especially perceived contact and comfort, may be a key leverage point in fostering more positive outcomes for at-risk students. Interventions designed to change teacher attitudes and behaviors toward parents hold promise for altering parent participation patterns, which in turn could improve student outcomes. Given that teachers interact with dozens of parents and students each year, teacher focused training that addresses parent involvement also has the advantage of broader, class-wide impact than interventions delivered individually to parents. One teacher focused intervention is the Incredible Years Teacher Classroom Management (IY TCM) program (Webster-Stratton & Reid, 2010).

IY TCM Program and Parent Involvement

IY TCM was developed as a companion to the IY Parent intervention, the well-established treatment for youth with conduct problems, to address the common finding that parenting interventions alone do not always improve student behaviors at school (Taylor & Biglan, 1998; Webster-Stratton, 1990). IY TCM was designed as a 6-day teacher training program focused on improving teacher–student and teacher–parent relationships and increasing teacher use of effective classroom management strategies. In particular, IY TCM has a primary goal of encouraging teachers to examine their assumptions and biases about parents and to develop and/or repair relationships with challenging students and families. Although IY TCM has been shown to improve teacher classroom management behaviors and child outcomes in a stand-alone intervention (Reinke, Herman, & Dong, 2014; Reinke, Stormont, Herman, & Newcomer, 2014) and as part of multicomponent interventions (Webster-Stratton, Reid, & Hammond, 2001, 2004; Webster-Stratton, Reid, & Stoolmiller, 2008), no research has reported its impact on parent involvement.

This study examined the effects of the IY TCM on teacher perceptions of contact and comfort with parents. We believe this is the first randomized trial to evaluate the effects of any universal teacher training program on parent involvement profiles. Using a person-centered approach, we conducted latent profile analyses (LPA) on teacher ratings of parent contact and comfort at baseline and follow-up to identify profiles of involvement. Given our definition of

teacher perceived parent involvement as a pattern of co-occurring constructs, contact and comfort, LPA was the optimal method for defining these patterns. Similar to findings from Stormont et al. (2013), which relied on the baseline scores of the first cohort of participants in the present trial, we hypothesized that three profiles would emerge at both time points characterized by the following: (a) high contact/high comfort, (b) low contact/high comfort, and (c) low contact/low comfort. To validate the profiles, we next examined their relations with documented correlates. Specifically, we hypothesized that students of parents in the low contact and low comfort profile would have significantly higher observed and teacher-rated behavior problems and lower academic performance compared to other profiles.

Next, we conducted latent transition analyses (LTA) to test the hypothesis that teachers who received the training would be more likely to shift into adaptive profiles at follow-up. LTA is an advanced analytic method for examining changes in profile membership (e.g., low contact/high comfort, low contact/low comfort) derived from LPAs at two time points (see Thompson, Macy, & Fraser, 2011). LTA afforded the opportunity to examine intervention effects on these patterns rather than on mean level changes of singular variables. We expected teachers who received IY TCM would be more likely to have parents shift into more adaptive profile patterns (characterized by either higher levels of contact and comfort or by favorable student outcomes) at follow-up compared to teachers in the business-as-usual condition.

Method

Participants

Participants in this group randomized trial were 105 teachers and 1818 students in Grades kindergarten to third from nine urban schools serving primarily African American students. As indicated in the participant flowchart (see Figure 1), the study had high rates of enrollment for eligible teachers (96%) and students (84%). All teacher participants and parents provided written consent, and all students provided written assent to participate in the study. Teachers were randomly assigned within schools to receive IY TCM or to a wait-list, business-as-usual control group. The majority of teacher participants were female (97%) and White (75%; 22% African American and 3% other). The student sample included more males (52%) and African Americans (76%; 22% White, and 2% other), and half the student sample qualified for free or reduced lunch.

Measures

Student demographics. Free and reduced lunch status (FRL), student race, and sex were obtained from the school district for all participating students. Students were coded as 1 if they received FRL and 0 if not. Students were coded as 1 if they were African American, and 0 if not, because of small cell size for students in the other race category.

Parent contact and comfort. The *Parent Involvement Measure – Teacher* (Conduct Problems Prevention Research Group [CPPRG], 1991) is a 21-item measure that assesses facets of parent involvement. This measure was completed by the classroom teacher for each student. Two subscales, Parent—Teacher Contact and Parent Comfort, were included in the latent profile analysis to explore specific subtypes of parent involvement. The item responses ranged from 0 (*not at all or never*) to 4 (*very interested, very often, very comfortable, a whole lot, more than once a week*). Factor analysis on this measure documented strong support for the comfort and contact factors (Miller-Johnson & Maumary-Gremaud, 1995). Malone (2000) found evidence that the measure can discriminate between high and low risk samples. For the current control group sample, the test–retest reliability from fall to spring for each subscale were .57 (Parent–Teacher Contact) and .68 (Parent Comfort), respectively.

Academic achievement. The W*oodcock–Johnson III Normative Update Tests of Achievement* (WJ III ACH; Woodcock, McGrew, & Mather, 2007) is an assessment of student academic achievement. The present study included two subscales, Broad Reading and Broad Math. The WJ III ACH is a well-established measure with strong psychometrics. Teachers also rated student academic competence using the *Social Competence Scale – Teacher version* (T-COMP; CPPRG, 1995). The item responses range from 0 (*almost never*) to 4 (*almost al-*

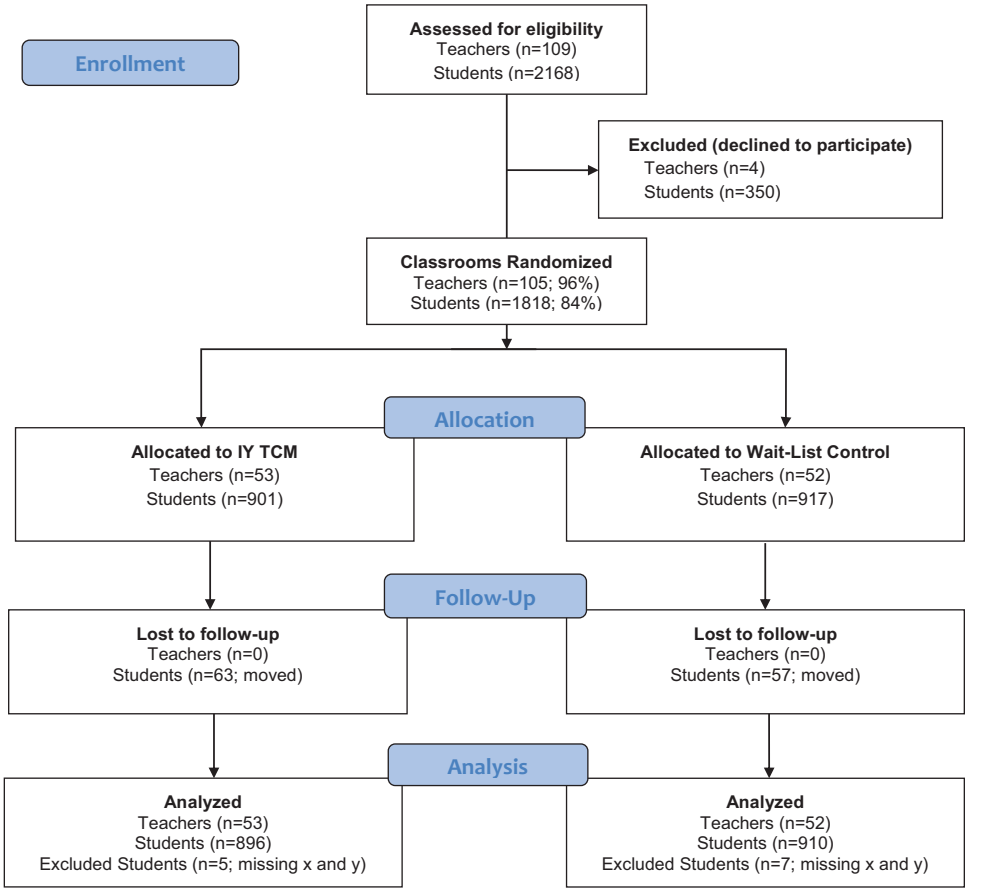


Figure 1. IY TCM randomization participant flowchart. See the online article for the color version of this figure.

ways). Previous research has found adequate psychometric properties for the T-COMP (CP-PRG, 1995; Gouley, Brotman, Huang, & Shrout 2008).

Direct observations of students. Independent observers conducted direct observations of teacher and student behaviors using the Multi-Option Observation System for Experimental Studies (MOOSES; Tapp, 2004) interface for handheld computers to gather real-time data using the Brief Student–Teacher Classroom Interaction Observation code (ST-CIO; Reinke & Newcomer, 2010). The ST-CIO simultaneously collects counts/duration of teacher behaviors (praise, reprimands/teaching) and student behaviors (disruptions/off task). Each student was observed for 5 min during academic instruction times (reading or math). Prior to data collection, full-time research staff and graduate student observers were trained for 2 weeks using videos and practice sessions to reach 85% reliability with a master coder. Reliability checks were conducted on a random subset of 29% of all observations, and observers received continuing supervision to ensure against observer drift. The mean percent agreement on the ST-CIO was 93% for end-of-the-year observations. MOOSES utilizes a rigorous second-by-second comparison of raters to determine reliability, and an overall reliability of 80% is considered acceptable; thus 93% is considered highly reliable (Tapp, 2004).

Teacher ratings of student disruptive behaviors and family problems. Teachers also rated student disruptive behaviors and family problems on the *Teacher Observation of Class-*

room Adaptation-Checklist (TOCA-C; Koth, Bradshaw, & Leaf, 2009) in October and April of the academic year. The item responses ranged from 1 (*never*) to 6 (*almost always*). The TOCA-C is a reliable and valid measure. A recent factor analytic study confirmed the factor structure of the TOCA-C in our sample and found it to have strong psychometric properties in terms of goodness of fit and measurement invariance (Wang et al., 2015).

Procedures

Teachers and students were recruited at the beginning of the school year. All baseline assessments occurred in late September and early October, prior to the intervention. Postassessments occurred at the end of the same school year, in late April and early May.

In three sequential, annual cohorts of 15–20, teachers in the IY TCM condition attended three sets of two full-day group trainings in late October, December, and February. All trainings were cofacilitated by two doctoral level IY TCM group leaders who were supervised by the program developer; one of these trainers also served as a coach who supported teacher implementation following sessions.

IY TCM is a comprehensive curriculum for improving teacher classroom management and relationship skills. IY views solid relationships with all students and parents as a necessary element of successful classroom management. In particular, the IY TCM logic model identifies "positive parent–teacher partnerships" as one of three program goals, specifies parent involvement activities as a key modality or strategy, and targets positive parent–teacher relations as a proximal outcome of the program. Parental involvement is discussed in every training workshop and includes strategies to assist teachers to develop better relationships with parents and create opportunities for parents to get involved in a child's education. The entire first full day of training (seven hours) is focused on building relationships with parents and students. Much time during all training sessions is devoted to observing video vignettes of actual teacher interactions with students and parents. Each vignette provides a model for effective interaction and also evokes discussion and insight about the *teacher's beliefs, biases, and perceptions* of these interactions. The trainers prompt reflections with Socratic questioning about the videos ("How are you feeling as the teacher in this situation?" "How is the student/parent feeling?" "What is the student/parent learning?" "How would you respond in this situation?") and facilitate group discussion. These conversations spark role plays to practice challenging interactions. In this way teachers can serve as models for others and/or get feedback about improving their interactions. Each section of the training provides ample time for self-reflection; teachers respond to a series of questions about their current practices (e.g., what do I do to make parents feel valued and welcome, what am I doing that may lead parents to feel unvalued or unwelcome) and what they can do differently.

Time is also allotted for teachers to develop plans for improving their classroom ecology and for developing behavior support plans for responding to challenging students and parents. These plans always include specific prompts for how the teacher will engage parents (see Reinke et al., 2014 for more details about these plans and outcomes in this sample). Specific tools and strategies are provided in the materials that each teacher receives including letters that can be sent home to facilitate home school communication. A coach meets with teachers on a regular basis after the first workshop through the end of the school year; the amount of time and focus of these meetings is tailored to the teachers' interests and needs. (For more information about curriculum content see http://incredibleyears.com/programs/teacher/classroom-mgt-curriculum). Fidelity of implementation of the program and teacher implementation skills were monitored over the course of the year and are documented in a separate report (see Reinke, Herman, Stormont, Newcomer, & David, 2013). In summary, teachers in the intervention were all exposed to the training workshops; nearly all teachers attended all six workshops (attendance rate was 94%–100% for each workshop), and the few teachers who missed a workshop because of illness met with a coach to review missed material. Teachers rated the workshops with high satisfaction and likelihood of recommending the training to others (mean ratings of 6.44–6.75 on a scale from 1–7 with high scores indicating greater satisfaction). Teachers also received a strong dose of coaching. The average amount of time each teacher spent with a

coach between and after workshop sessions was nearly six hours (358 min). Direct observations revealed that teachers in the intervention condition used higher rates of proactive teaching strategies compared to control teachers at each follow-up point. Follow-up assessments were collected in late April and May of the same academic year.

Control

Teachers assigned to the wait-list control condition continued their business as usual teaching and pursuing professional development opportunities during the study period. They were offered IY TCM at the end of the study after follow-up data had been collected.

Analysis Plan

Latent profile and transition analyses (LPA and LTA, respectively) were used to examine patterns of two indicators of teacher perceived parent involvement, contact and comfort (Nylund et al., 2005). First, we conducted unconditional LPAs at each time point to determine the optimal number of profiles. Second, we examined independent correlates of identified classes to confirm their distinctiveness and meaningfulness using the Auxiliary function in MPlus. Third, we conducted an LTA to report transitions between profiles over time. Finally, we repeated the LTA with treatment condition as a covariate to determine if treatment predicted class membership at follow-up. Conditional models also accounted for clustering of students within classrooms and included student sex, race, and lunch status as covariates. All analyses were conducted using MPlus 6.1 (Muthén & Muthén, 1998–2010). In LPA, a combination of statistical considerations and substantive theory are used to decide on the best fitting model. LPA decision rules are given in the supplemental materials. In LTA, we used the KNOWNCLASS command to identify treatment condition as a categorical latent variable for which class membership was known (Muthén & Muthén, 1998–2010).

To accommodate for missing data, Mplus software uses full information maximum likelihood with the assumption that the data are missing at random (Little, 1995), a common approach employed within this analysis method (Schafer & Graham, 2002). The minimum covariance coverage recommended for reliable model convergence is 0.10 (Muthén & Muthén, 1998-2010). In this study, coverage ranged from 0.924 to 0.987.

Results

Latent Profile Analysis of Baseline and Follow-Up Parent Contact and Comfort

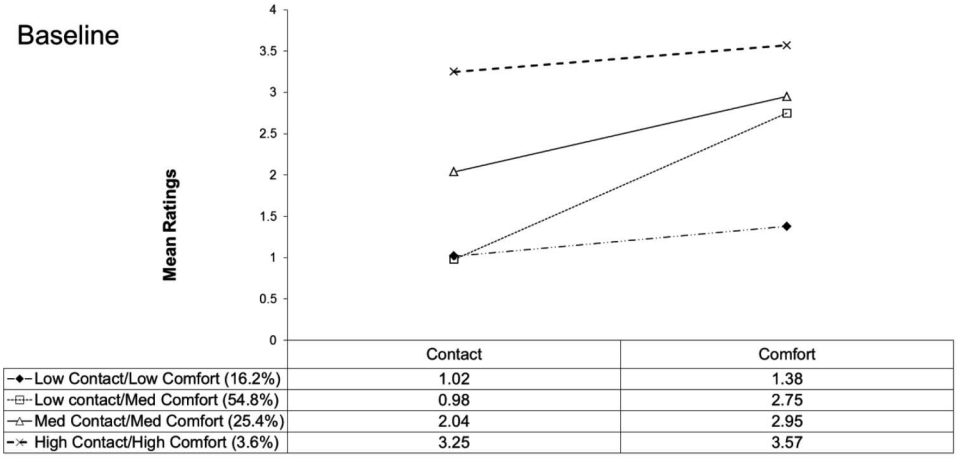
Teacher ratings of parent contact and comfort were entered as indicators in LPAs at baseline and follow-up. LPA fit indices for class solutions are summarized in Table 1. We used these fit indices as well as theory and prior literature to select the four class solution as the best fitting model at both time points. The four class solutions had significantly lower values than the three class solutions, and a parametric bootstrapping likelihood ratio test in mixture analyses confirmed it as a better fit than the three class model. The BIC values for the four and five class solutions

Table 1
Model Fit Indices For 1–5 Class Solutions of Baseline and Follow-Up

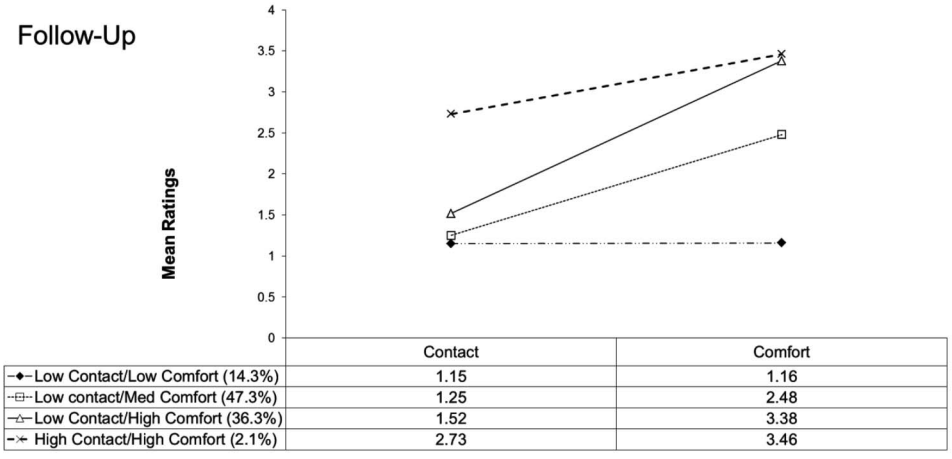
	Baseline				Follow-Up			
LC	BIC	aBIC	VLMR	Entropy	BIC	aBIC	VLMR	Entropy
1	7898.84	7886.14	—	—	6479.47	6466.76	—	—
2	7624.67	7602.44	.04	.74	6289.45	6267.21	.02	.67
3	7579.16	7547.39	.27	.62	6163.54	6131.77	.46	.73
[a]**4**	**7562.48**	**7521.17**	**.10**	**.63**	**6109.68**	**6068.39**	**.04**	**.72**
5	7561.62	7510.79	.42	.67	6101.86	6051.03	.42	.72

Note. LC = Latent Classes; BIC = Bayesian Information Criterion; aBIC = adjusted Bayesian Information Criterion; VLMR = Vuong-Lo-Mendell-Rubin.
[a] Bold indicates equal selected class solution.

were comparably low, and the fifth class did not provide additional information relevant to the outcome questions of interest to the study. That is, the fifth class that emerged in both five class models represented a very small percentage of parents (3%) and was not conceptually relevant (i.e., the average ratings on both indicators were very similar to those observed for the fourth class); moreover, subsequent analyses revealed the fifth class was not distinguished by behavior or academic correlates. Thus, we rejected the fifth class in favor of the more parsimonious four class solution. Figure 2 summarizes the prevalence and characteristics of the classes at each time point. The four class solution included three classes that we hypothesized: (1) High Contact/High Comfort, (2) Low Contact/Medium Comfort, and (3) Low Contact/Low Comfort. The fourth class was characterized by Medium Contact/Medium Comfort at baseline and Low Contact/High Comfort at follow-up. For transition purposes, we considered these fourth classes as comparable because they represented a similar proportion of participants at each time point, and they were both characterized by contact and comfort mean ratings that fell between the High/High and Low/Medium profiles at both time points. Roughly half the sample fell into Low Contact/Medium Comfort at both time points (54.8% and 47.3%, respectively). The Low



	Contact	Comfort
Low Contact/Low Comfort (16.2%)	1.02	1.38
Low contact/Med Comfort (54.8%)	0.98	2.75
Med Contact/Med Comfort (25.4%)	2.04	2.95
High Contact/High Comfort (3.6%)	3.25	3.57



	Contact	Comfort
Low Contact/Low Comfort (14.3%)	1.15	1.16
Low contact/Med Comfort (47.3%)	1.25	2.48
Low Contact/High Comfort (36.3%)	1.52	3.38
High Contact/High Comfort (2.1%)	2.73	3.46

Figure 2. Baseline and follow-up profiles of contact and comfort.

Contact/Low Comfort (16.2% and 14.3%, respectively) and High Contact/High Comfort (3.6% and 2.1%, respectively) profiles were less common.

Demographic Correlates of Class Membership

Demographic variables were uniquely related to several baseline and follow-up classes. At baseline, the Low Contact/Low Comfort class was significantly more likely to have FRL students than the High Contact/High Comfort class (*OR*: 2.79; 1.59–4.42); girls were more likely to appear in the Low Contact/Medium Comfort (*OR*: 1.73; 1.16–2.41) and Medium Contact/Medium Comfort (*OR*: 2.14; 1.09–4.23). At baseline, the Low Contact/Low Comfort class was significantly more likely to have FRL (*OR*: 3.35; 1.66–6.75) and African American students (*OR*: 13.51; 2.20–83.33) than the Low Contact/High Comfort class. At follow-up, African American students were more likely to appear in the Low Contact/Low Comfort class compared to the High Contact/High Comfort class (*OR*: 5.56; 1.15–27.03), and girls were more likely to be in the Low Contact/Medium Comfort class compared to the Low Contact/High Comfort class (*OR*: 1.99; 1.32–3.01).

Academic Skills and Behaviors Associated With Follow-Up Classes

We examined the association between classes at follow-up and indicators of academic performance, student behaviors, and family problems (see Table 2). Equality tests of means across classes using posterior probability-based multiple imputations revealed a number of significant differences among the parent involvement profiles. The Low Contact/Low Comfort class had significantly lower academic performance compared to the other three groups across all comparisons. Additionally, the Low Contact/High Comfort class had the highest academic performance on all academic measures, even in comparison to the High Contact/High Comfort group on teacher ratings and WJ Reading scores. Notably, the mean standard score on the math and reading subtests of the WJ was 10 points lower for students in the Low Contact/Low Comfort compared to the Low Contact/High Comfort class. Additionally, independent

Table 2
Estimated Mean Scores On Family Problems and Student Achievement and Behaviors by Class at Follow-Up

Variables	1 Low Contact Low Comfort M (SE)	2 Low Contact Medium Comfort M (SE)	3 Low Contact High Comfort M (SE)	4 High Contact High Comfort M (SE)	Significant class comparisons
Teacher report					
Family Problems	3.80 (.09)	2.34 (.04)	1.74 (.04)	2.21 (.21)	1 vs. All***, 2 vs. 3***, 3 vs. 4*
Disruptive	2.38 (.07)	1.87 (.03)	1.69 (.03)	2.41 (.19)	3 vs. All***, 2 vs. 1,4***
Prosocial	4.03 (.08)	4.69 (.04)	5.12 (.04)	4.34 (.21)	3 vs. All***
Academics (COMPS)	2.22 (.08)	3.39 (.05)	4.05 (.05)	3.44 (.22)	1 vs. All***, 2,3 vs. 4***
Achievement					
WJ Reading	92.42 (1.00)	99.51 (.52)	103.47 (.50)	100.80 (2.41)	1 vs. All***, 2 vs. 3***
WJ Math	89.78 (1.12)	96.66 (.63)	100.17 (.65)	94.25 (2.74)	1,2 vs. 3***, 3 vs. 4*
Direct observations					
Off Task	.095 (.01)	.070 (.01)	.059 (.01)	.071 (.02)	1 vs. 3**
Disruptions	.076 (.01)	.064 (.01)	.045 (.01)	.101 (.03)	1,2 vs. 3*

* $p < .05$. ** $p \leq .01$. *** $p \leq .001$.

direct observations of student behavior in the classroom found that students of parents in the Low Contact/Low Comfort class had significantly higher rates of disruptive and off-task behaviors compared to students of parents in the Low Contact/High Comfort class. Teacher ratings of student disruptive behaviors confirmed these findings. Additionally, teachers rated families in the Low Contact/Low Comfort class as having significantly more family problems than the other classes. Across most comparisons, the Low Contact/High Comfort profile emerged as having the most positive child and family correlates. The High Contact/High Comfort profile was associated with some student academic and behavior problems. As did Stormont et al. (2013), we interpreted this finding as indicating an adaptive pattern of parent involvement in education, perhaps in response to student challenges with school, given that teachers were perceiving these parents favorably (i.e., as highly involved and comfortable).

LTA Intervention Effects

We first conducted an LTA without covariates. (We provide joint and conditional probabilities from these analyses in the supplemental materials.) We then repeated the LTA with intervention, sex, race, and lunch status as predictors of baseline and follow-up class membership. Intervention condition was unrelated to baseline class membership, suggesting that randomization resulted in baseline equivalence between intervention conditions in profile patterns. Thus, analyses focused on intervention effects of follow-up class membership.

As hypothesized, intervention predicted follow-up class membership. Parents of intervention teachers were more likely to be in the High Contact/High Comfort class at follow-up versus the Low Contact/Low Contact (*OR*: 4.55; 1.09–19.03) and Low Contact/Medium Comfort classes (*OR*: 5.30; 1.21–22.36). Intervention teachers were also more likely to rate parents as being in the Low Contact/High Comfort class compared to the Low Contact/Low Comfort (*OR*: 2.95; 1.40–6.49) and Low Contact/Medium Comfort classes (*OR*: 3.43; 1.40–8.43). One quarter of the sample (459 parents) were in the most adaptive classes (High Contact/High Comfort and Low Contact/High Comfort) at follow-up, and 77% of these parents were from the intervention group.

Examining transitions among classes also provided support for the treatment condition. Only 7% of parents for control teachers in the lower two adaptive classes at baseline transitioned to a more adaptive class at follow-up, compared to 39% of parents for intervention teachers who transitioned to a more adaptive class. Particularly striking, only 2% of control parents in the Low/Low class at baseline transitioned to the most adaptive classes at follow-up, compared to 25% for the intervention group. Moreover, 80% of parents who transitioned to the High Contact/High Comfort class at follow-up were from the intervention group, versus 20% from the control group.

Finally, we examined likelihood of progressing, digressing, or staying in a given class between conditions (see Figure 3). We defined Stayers as those with stable membership in a class at both time points. Progressors were those who moved from a less adaptive class to a more adaptive class from baseline to follow-up. Digressors were defined by movement from a more adaptive class to a less adaptive class. Given that Low Contact/High Comfort and High Contact/High Comfort both were characterized as types of adaptive involvement (the former because students in this class had the most favorable outcomes and the latter because it represented the highest scores on both types of involvement), we considered movements between these classes as types of Stayers (i.e., it did not make conceptual sense to characterize movement between these classes either as a type of progression or digression). Chi-square analyses indicated that progression was more likely in the intervention group and digression was more likely in the control group ($\chi^2[2] = 65.21$; $p < .0001$; $\varphi_c = .19$). Specifically, the observed occurrence of progression was 38% less than expected for the control group and 38.6% more than expected for the intervention group. Counterfactual evidence was also found in the observed frequency of digression in the control group, which was 22.4% more than expected and 22.8% less than expected in the intervention condition (see Table 3).

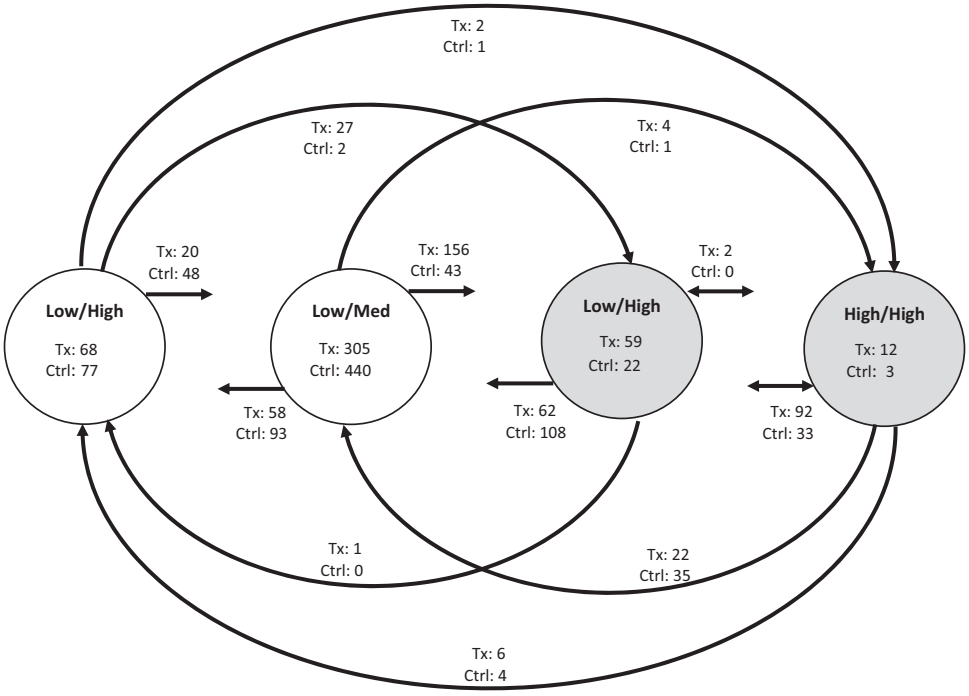


Figure 3. Transition patterns for intervention (n = 896) and control (n = 908) participants. Note: Circles indicate Stayers, those with stable membership within class over time. Forward arrows (→) indicate Progressors, those who moved from a less adaptive class to more adaptive class. Back arrows (←) indicate Digressors, those who moved from a more adaptive class to a less adaptive class. Double arrows (←→) indicate transitions between the most adaptive classes (shaded gray).

Discussion

This may be the first randomized trial to find significant improvement in teacher perceptions of parent educational involvement following a universal teacher training intervention. Although the primary outcome focused on teacher perceptions of involvement only, existing evidence suggests that such perceptions are a meaningful educational outcome. First, prior studies suggest that teacher perceptions of parent involvement may provide the strongest predictors of future student success and thus are a highly relevant target of intervention. The compelling literature showing longitudinal, independent links between teacher perceptions of parent involvement and educational outcomes through high school (see Bakker et al., 2007; Barnard, 2004; Izzo et al., 1999; Miedel & Reynolds, 2000) suggest that IY TCM's significant impact on parent involvement profiles may lead to long-term educational benefit for students. Second, profiles of teacher-rated parent involvement were associated with objective educational outcomes in this study including performance on standardized achievement tests, teacher ratings of academic skills and behavior problems, and independent observations of disruptive and off task classroom behaviors.

Table 3
Chi Square Analysis of Progressors, Stayers, and Digressors

Transitions	Control	Treatment	Totals
Progressors	95	209	304
Stayers	575	538	1113
Digressors	240	149	389
Totals	910	896	1806

Note. χ^2 (2) = 65.21; $p < .002$; $\varphi_c = .19$.

The primary focus of the study was on using sophisticated modeling techniques to

determine if teacher ratings of parent involvement could be altered by an intervention. The person-centered analyses indicated that profiles of perceived contact and comfort provide a valuable method for understanding parent involvement and supporting student outcomes. Low contact alone was not associated with adverse student performance or outcomes. The worst correlates were observed for students with low contact and low comfort parents, whereas, the low contact and high comfort profile was associated with higher academic achievement and lower behavior problems. These findings imply that a dimensional, profile approach adds a more nuanced portrayal of involvement patterns than can be captured by single indicators.

Notably, the low contact and low comfort profile had a greater probability of being composed of parents of African American students, students from low income backgrounds, and students with academic and behavior problems. Other researchers have documented that involvement, however it is measured, tends to be lowest for families from cultural minority groups and students at risk for school failure (El Nokali et al., 2010; Park et al., 1994; Stormont et al., 2013). That students in intervention classrooms had a greater probability of appearing in the most adaptive profiles versus the least adaptive profile (i.e., low contact and low comfort) at follow-up suggests IY TCM may hold benefit for improving educational outcomes for families and students with the greatest needs.

In line with Stormont et al. (2013), low contact alone was not a risk for teacher-rated discomfort or for negative student outcomes. This implies that teachers base their discomfort on something other than actual contact with parents. Given the background characteristics of students and parents in the low contact and low comfort group, prime candidates to explain teacher perceived discomfort with parents include racial or social economic differences and teacher interpretation of students' misbehavior and/or skill deficits as a reflection of the parent (see Stormont et al., 2013). Given the amount of focus devoted to examining teacher bias and building empathy for children and parents in IY TCM, a tenable hypothesis is that the training improves teacher perceptions of parent involvement by altering what otherwise would remain ingrained assumptions about parents who differ from them and/or who have students with school problems. Notably, a recent study found that the effects of an intensive teacher–parent consultation model on youth outcomes were mediated by teacher perceptions of parent involvement, but not parent perceptions of involvement (Sheridan et al., 2012). This finding is consistent with the idea that changing teacher attitudes about parents contributes to student outcomes, possibly by fostering improved relations with students and in turn increases in student engagement (Hughes & Kwok, 2007).

Limitations and Future Directions

Unfortunately, the present study design did not allow us to test mechanisms between intervention, teacher perceptions of parents, and student outcomes. IY TCM is a multifaceted intervention so we cannot be sure the observed changes in teacher perceptions occurred because of specific program components or because of the intervention package. Because IY TCM provides explicit instruction and practice to support improvements in teacher–parent interactions, it is possible that teachers became more skilled at involving parents in school, which led to successful interactions and improved perceptions of one another. It is also possible that teacher-observed improvements in student behaviors may have been the result of the entire program package (including effective classroom management behaviors), which led them to develop more positive attitudes about parents. One way to examine these alternate hypotheses of program effects would be through a dismantling study comparing the effects of the entire program to a condensed version with only content related to parent–teacher relationships. Additionally, future studies are needed that include measures of parent–teacher and teacher–student interactions at multiple time points to provide more fine-tuned analyses of when and how changes in teacher perceptions contribute to student success. Future studies are also needed to assess parent perceptions of their own involvement and of teacher efforts in involving them in school. Such studies would help determine if improvement in teacher perceptions of parents coincide with parent perceptions and whether any new perceptions lead to changes in behavior.

Implications

Findings from the present study suggested that training teachers to assess their perceptions of parents and students and equipping them with skills to be more effective in parent interactions holds promise for promoting parent involvement in education on a broad scale. Improvements in teacher-perceived parent involvement is associated with positive educational and social outcomes for all students. Given that teachers interact with entire classrooms of students and their parents each year, improving teacher skill in and awareness of promoting parent involvement has the potential to foster positive youth development more efficiently than working with one parent at a time. For youth at highest risk for academic and behavior problems, working with parents alone may not be enough to improve success in school settings for these children (Taylor & Biglan, 1998; Webster-Stratton, 1990). Yet it may not be realistic for a school psychologist to work with each child's teacher to promote more effective parent involvement strategies. Instead, universal teacher training programs like IY TCM may complement efforts to improve academic and social outcomes for all students, including those with the greatest need.

School psychologists implementing evidence-based parenting programs for children with behavior disorders are encouraged to consult with the child's teacher about classroom management issues based on IY TCM principles. Equipping teachers with skills and adaptive cognitions in working with parents of children with behavior problems using IY TCM strategies may help overcome the common challenges teachers experience in these relationships. Prior studies have implemented IY TCM with teachers of students with conduct problems whose parents also received IY Parent and found additive effects on student outcomes (Webster-Stratton et al., 2004). The present findings suggested that part of the benefit of the IY TCM approach on student outcomes may arise from improvements in teacher assumptions about parents and/or knowledge of strategies to improve parent school involvement and not simply changes in the classroom environment. IY TCM also provides school psychologists with a training model for addressing teacher biases about students and parents that can undermine academic success. Given the well-established influence of teacher expectancy on student educational success (see Rosenthal, 1994), any strategy for fostering adaptive expectations of students and parents will likely go a long way toward helping students with the most intense needs in schools to be successful.

Conclusion

Parent involvement in education is a valued outcome in itself. Teacher beliefs about and attitudes toward parents likely affect their interactions with students. Thus, altering these perceptions to be more favorable can promote student learning and development. The findings from the present study suggested that IY TCM provides one method for fostering greater parent involvement in education that may benefit students with academic and behavior problems.

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