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Teacher collaboration in the context of the *Responsive Classroom* approach

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This mixed-method study examined characteristics and predictors of teacher collaboration. Limited research exists that describes the characteristics of teacher collaboration, and surprisingly little work explains the ways in which teaching experience and teachers' perceptions of the school environment influence teacher collaboration. Questionnaire data were collected from a sample of 118 elementary school teachers in six schools in a northeast urban school district, and interviews were conducted with administrators in each school. Three schools were in their second year implementing the *Responsive Classroom*® (RC) approach, and three schools were comparison schools. Teachers reported collaborating approximately once or twice per month, generally with fellow grade-level teachers about student-centered topics. Teachers in RC schools reported more frequent formal collaboration than comparison school teachers. In regards to predicting teacher collaboration, teachers who used more RC practices and/or resources reported collaborating more, valuing collaboration to a higher degree, and perceiving greater involvement in school decision-making, controlling for whether they taught at a RC school. Also, teachers' perceptions of the school environment related positively to teacher collaboration. The current study adds to the understanding of teacher collaboration and its antecedents, contributing uniquely to the literature on how a school-wide educational initiative is associated with teachers' perceptions of their school environment as well as their collaborative behaviors and beliefs.

Keywords: *Collaboration;* Responsive Classroom *approach; Elementary school teachers; Teacher beliefs; Teacher practices*

Teachers face heavy workloads and increased responsibilities in American schools. The challenge of teaching has only increased as a greater percentage of students come to school 'at-risk' of school failure and as teachers are held to higher standards of accountability (Zill, 1999). At present, 50% of teachers leave within their first five years of teaching, creating shortages as more teachers leave than enter the workforce

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(Ingersoll, 2001). Complicating matters, the National Center for Educational Statistics (NCES, 2005) projects that student enrollment will rise 4% by 2014, resulting in an increased need for teachers. Thus, teacher stress and the interventions designed to ameliorate it have become a matter of national importance.

The National Commission on Teaching and America's Future (NCTAF, 2003) has led the effort to transform schools into learning communities. The goal of these learning communities is to enhance teacher collaboration in order to increase teachers' capacity, provide opportunities for professional development within the parameters of the school environment, and ultimately, to increase the professionalism and satisfaction of teachers (Eaker *et al.*, 2002; Martin-Kniep, 2004). Although this goal is laudable, research is necessary to examine the mechanisms by which collaboration can be increased and such learning communities can become a reality, even in the context of heightened demands for accountability.

To date, little research exists that describes the characteristics or discusses the predictors of teacher collaboration. Existing research shows that collaboration in schools is scarce and difficult to sustain (e.g., Little, 1987, 1990; Zahorik, 1987; Huberman, 1993). Thus, the purpose of the present study is to describe what 'typically' happens when teachers collaborate, to identify what factors influence teacher collaboration and to examine the ways in which an intervention, the *Responsive Classroom*® (RC) approach, fosters teacher collaboration. The current study was framed by a social organizational perspective, which posits that individuals develop meanings (i.e., beliefs, attitudes and behaviors) based on how they perceive the school's environment (with perceptions affected by personal characteristics, such as experience) as well as by the social interactions that occur within the work context (Rosenholtz, 1989).

What is the RC approach and in what ways does it carry the potential to foster teacher collaboration? The RC approach offers a set of principles and practices for teachers designed to integrate social and academic learning for children. A central goal of the RC approach is to develop a school-wide community. The RC approach advocates the use of specific practices designed to engender collaboration. For example, schools are encouraged to create 'home groups' where small groups of teachers representing many grades within a school meet regularly to discuss school-wide curricular goals and implementation of the RC approach. Teachers are encouraged to choose 'buddy teachers' who support teachers' efforts to discipline the most difficult children. Thus, the RC approach is designed not only to help schools meet the social and emotional needs of children, but also to foster a school-wide culture that offers emotional and social support to teachers and creates a culture of interdependence (as described by Huberman, 1993) as teachers strive to meet the high demands associated with teaching in an age of accountability.

The present study was conducted within the context of the Social and Academic Learning Study (SALS), a quasi-experimental, longitudinal study conducted by a team of researchers at the University of Virginia to examine the contribution of the RC approach (e.g., Rimm-Kaufman & Sawyer, 2004). Although more than 50,000 teachers have been trained in the RC approach nationwide, no research has been

conducted to examine the degree to which the RC approach can be viewed as a mechanism that promotes teacher collaboration. This intervention holds promise for creating sustained levels of teacher collaboration because it supports the development of relationships in the adult community in the school and offers strategies that restructure the ways in which teachers work together, consistent with Huberman's (1993) conceptualization.

What does collaboration look like?

We have conceptualized (and operationalized) teacher collaboration in terms of its required communicative behaviors. Problem solving or planning needs to occur for an interaction to be considered collaboration (Rosenholtz, 1989; Phillips & McCullough, 1990; Montague & Warger, 2001). Teacher collaboration occurs infrequently, with teachers interacting with colleagues only 5–10 hours per week (Miskel *et al.*, 1983; Zahorik, 1987; Gordon, 1996). When collaboration does occur, it generally happens in informal contexts; it occurs as a result of teachers' personal initiatives, rather than a regularized structure (Miskel *et al.*, 1983). Spontaneous conversations in the teachers' lounge or hallway are examples of informal collaboration (Hargreaves, 1994). Formalized collaboration, which happens less frequently, has protocols, guidelines and techniques, typically established by the school administration. Teaching teams, exchanging classes, co-teaching, peer coaching, study groups and small-scale conduction of applied research in supportive teams are several formal collaborative structures (Lortie, 1975; Thousand & Valli, 1989; Showers & Joyce, 1996; Birchak *et al.*, 1998; Little, 1999; Pfaff, 2000; Stokes, 2001).

Existing work suggests teachers often collaborate around more proximal, student-centered topics related to curriculum development (i.e., exchanging resources and lesson planning), individual student needs and classroom management (Zahorik, 1987; Johnson, 1990; Rogers & Babinski, 2002). Teachers seldom collaborate on more teacher-oriented topics, such as methods, objectives, lecturing, questioning, reinforcing, evaluating and room organization (Zahorik, 1987). When collaborating with their colleagues, teachers most often choose to work with teachers of their same grade level (Pellegrin, 1976; Zahorik, 1987).

It is worthwhile to consider how the communicative behaviors associated with teacher collaboration change teachers' personal experiences. Typically, teachers describe that effective teacher collaboration fosters change within the school, decreases ambiguity associated with decision-making and promotes an ethic of caring (DiPardo, 1999). The behaviors associated with teacher collaboration (i.e., discussions between teachers) have the potential to shape teachers' pedagogical beliefs (Horn, 2005). The ultimate goal of teacher collaboration is to create a base of pedagogical knowledge that is distributed among teachers within a school as opposed to being held by individual teachers (Horn, 2005). By these definitions, we can speculate that teacher collaboration better prepares teachers to do their work both individually and as a team.

What influences teacher collaboration?

The social organizational perspective posits that individuals develop meaning about work based on their prior experience and perceptions of the work environment as well as through the social interactions that occur in the work place. For this study, three teacher perceptions/attributes were identified as likely predictors of the frequency and characteristics of collaboration. Two refer to teachers' perceptions of the school environment (i.e., the degree to which the school's culture, processes and organization are barriers to collaboration and teachers' beliefs about the degree to which faculty share educational goals and values), and one refers to teachers' level of experience.

Teacher perceptions of the school environment

Barriers to collaboration.   Schools vary in terms of their culture, processes and physical layout, and teachers may perceive these environmental variables as being either conducive to or barriers to collaboration. Unfortunately, the current design and practices in schools today point to environmental variables as being more detrimental to collaboration.

The culture of a school influences teachers' collaborative behaviors, attitudes and beliefs, and unfortunately for teachers and students, most school cultures are ones of isolation and privacy (Lortie, 1975; Goodland, 1983; Lieberman & Miller, 1991; Hargreaves, 1994; Griffin, 1995; Fullan & Hargreaves, 1996; Garmston & Wellman, 1999; McLaughlin & Talbert, 2001; Rogers & Babinski, 2002). Administrators are integral in creating the culture of the school. Administrators must show teachers that they themselves prioritize collaboration; one way for administrators to promote and value collaboration is to actively engage in the practice (Alfonso & Goldsberry, 1982; Little, 1982; Bird & Little, 1986; Rosenholtz, 1989; Gerber, 1991; Leithwood *et al.*, 2000).

Not all school cultures encourage teacher collaboration, and hence, engaging in collaboration may have perceived or real costs to teachers (Gross & McMullen, 1982). Many teachers believe that asking for or accepting help paints them as failed, inferior or dependent (Fisher *et al.*, 1981; Gross & McMullen, 1982; Shapiro, 1984; Rosenholtz, 1985, 1989; Friend & Bauwens, 1988). Teachers may fear colleagues will not grant them full credit for their successes if the achievement is not accomplished individually (Fisher *et al.*, 1981; Eisenhart *et al.*, 1988). Many teachers also believe that assistance will decrease their control over their classrooms (Friend & Bauwens, 1988; Smylie, 1992), and thus decrease their level of personal freedom (Huberman, 1993) and creativity (Hargreaves, 1994). Conversely, teachers are loathe to offer unsolicited advice: 'noninterference with the core work of others constitutes a sign of professional respect' (Huberman, 1993, p. 29).

The social processes of a school have implications for teacher collaboration. Specifically, the process by which teachers are provided resources, such as time and

training, is strongly associated with teacher collaboration. Currently, teachers' schedules are such that time is not sufficient to develop collaborative relationships (e.g., Alfonso & Goldsberry, 1982; Ashton & Webb, 1986; Leithwood *et al.*, 2000). Teachers' workloads are so great that teachers may perceive collaboration or other teacher leadership roles as detracting from their classrooms (Huberman, 1993; Little, 2003). As teachers are not generally accustomed to working collaboratively, they often lack the skills to do so. 'We can't assume that interacting effectively with students requires the same skills as interacting well with adults' (Friend, 2000, p. 132). Administrators also influence collaboration through other school processes, such as the evaluation of teachers, recognition of teachers for their collaborative efforts and the hiring and placement of teachers (e.g., Little, 1990; Rosenholtz, 1990; Leithwood *et al.*, 2000).

In addition to school culture and processes, the way in which schools are physically organized is also associated with teacher collaboration. The cellular structure of most schools is a barrier to teacher collaboration (Lortie, 1975; Pellegrin, 1976; Rosenholtz, 1985; Hargreaves, 1994; Fullan & Hargreaves, 1996; Reinken, 1998; Little, 1999).

Shared educational goals and values.   Teachers who work in schools with strong shared educational cultures are more likely to collaborate than teachers who work in schools which lack school-wide consensus on educational goals and values (Nias *et al.*, 1989; Fullan & Hargreaves, 1996). Research and theory suggests that the relation between collaboration and shared goals is reciprocal in nature. Not only do shared educational goals and values influence teacher collaboration, but engaging in collaboration also appears to influence the development of a school's shared goals and values (Rosenholtz, 1985, 1989; Nias *et al.*, 1989; Talbert & McLaughlin, 1996). As will be explained in more detail, a prime objective of the RC approach is to strengthen the shared educational goals and values in schools. In the present study, we focus on the degree to which shared educational goals and values predict teacher collaboration and the degree to which they mediate the relation between the RC approach and teacher collaboration.

Teacher experience

As empirical studies on teacher collaboration have been relatively scarce, few findings indicate how teachers' years of experience is related to levels of collaboration, and even these have produced inconsistent findings. Several studies found no relation between experience and teacher collaboration (Bishop, 1977; Zahorik, 1987). However, other research findings have revealed that less experienced teachers tend to collaborate more frequently than more experienced teachers (Lortie, 1975; Hart, 1987). Teacher experience most proximally influences practices and beliefs (Hargreaves, 1984; Huberman, 1993). Thus, we were interested in determining whether, and how, amount of experience was related to teacher collaboration.

Responsive Classroom *approach*

It is important to consider context when studying teachers' practices (both in and out of the classroom). As was discussed earlier, collaboration is typically rare and difficult to sustain in schools because of the many demands on teachers and the current structuring and climate of schools. When the teachers' context includes whole-school reform, even more stress and demands are added into the teacher's daily work-life. Reforms potentially challenge teachers' beliefs and practices, and as such school-wide initiatives 'deplete or restore teachers' emotional energy' (Little, 1996, p. 352). Yet interestingly, collaboration may be more acceptable during times of school-wide reform (Huberman, 1993). Teachers generally avoid asking for help because of fears that colleagues will view them as inferior and dependent (e.g., Fisher *et al.*, 1981), but during times of school-wide reform, the potential stigma of collaborating is alleviated because everyone is facing novelty (Huberman, 1993).

The RC approach is a school-wide reform effort designed to establish a social environment conducive to academic achievement (Charney *et al.*, 1996). The RC approach encourages teacher collaboration through a number of principles that align with recommended practices to enhance an expanded collegial role for teachers. These practices include administrators prioritizing collaboration about teaching purposes and practices, the existence of regularized structures so that staff can come together at predictable times to discuss teaching practices and problem-solve, and connecting teachers to outside groups to further their professional development (Little, 2003).

Administrators in RC implementing schools prioritize collaboration by organizing several forms of collegial meetings. Home groups and network meetings are held regularly and proceed in a consistent format (NEFC, 2001). In home groups, teachers of various grade levels and various levels of experience come together weekly or bi-weekly to discuss implementation of RC practices in their classrooms. As a group, teachers typically pose problems and brainstorm solutions. Most home groups typically expand their discussion beyond the RC approach to talk about curricular issues and alignment of curricular goals across the age groups. Network meetings occur approximately three to four times a year. These meetings include teachers from various schools, all implementing the RC approach. Often, these meetings are run by local teachers who have received extensive training in RC and have become RC trainers. Together, teachers raise problems, discuss solutions and exchange ways to tailor the RC approach to the needs of the children in their classroom and the goals of the school and district.

In addition to regularized meetings, the RC approach also encourages teachers to have a buddy teacher, a consistent colleague to whom teachers can turn when they are in need of assistance with the behavioral problem of a student (NEFC, 2001).

The Northeast Foundation for Children (NEFC; i.e., outside organization) provides training and technical assistance to schools. NEFC shares resources with teachers through regional and school-wide trainings, individual consults and other resource materials, such as newsletters, books and website. Also, NEFC selects a core group of teachers (approximately 8–10 teachers) within the school whose role is to

support newly trained RC teachers. The RC core teachers conduct observations in teachers' classrooms and act as mentors in teachers' individual implementation of RC practices. With extensive training from NEFC, core teachers can become RC trainers themselves. They then can train newly hired teachers and reach out to other nearby schools to offer RC training. This is viewed as a key mechanism for promoting sustainability of the RC approach.

In general, teachers are encouraged to collectively reflect on their practices to ensure that they are aligned with children's physical, cognitive and social development and promote an adult community atmosphere. The RC approach establishes strong shared educational goals and values by providing teachers with multiple resources which outline consistent pedagogical practices for the differing developmental stages of their students (Wood, 1994; NEFC, 1997); thus, the RC approach creates a common professional language. The underlying goal of these RC school-wide practices is for teachers to learn teaching is a collective, not an individualistic, enterprise.

Case studies and preliminary evaluations have been conducted to examine the effectiveness of the RC approach (e.g., Elliot, 1995; Charney & Kriete, 2001). In 2001, researchers at the University of Virginia began the SALS, a quasi-experimental, longitudinal study of the contribution of the RC approach in producing teacher change and child growth. The first two papers emerging from this study demonstrate the relation between the RC approach and a distinct set of teacher beliefs, attitudes and priorities (see Rimm-Kaufman & Sawyer, 2004; Rimm-Kaufman *et al.*, 2006).

According to the social organizational perspective, the RC approach is an overarching influence because it affects both the structures of the school and the social interactions that occur within the school. The RC approach is designed to foster collaboration via the creation of regularized groups, the prioritization of collaboration by administrators and the support of NEFC.

Research questions and hypotheses

Four research questions directed the current study, and the hypothesized relations are depicted in Figure 1. Using the social organizational perspective as a framework for the current study and employing a mixed methodology, we examined how use of and training in the RC approach, teacher experience and teachers' perceptions of the school environment (i.e., perceived barriers to collaboration and perceptions of school's shared educational goals and values) were related to teacher collaboration.

Question 1: How do the frequency and characteristics of collaboration differ at RC and comparison schools? Our expectation was that teachers at RC schools would collaborate more frequently, about more topics, in more places and would place more value on collaboration than teachers in comparison schools.

Question 2: In what ways is the RC approach related to teacher collaboration? This relation is represented by the arrow between the RC block and the teacher collaboration block (see Figure 1). We expected that teachers in RC schools and also teachers who reported having more RC training and using more RC resources and practices would exhibit more collaborative behaviors and more positive attitudes about collaboration.
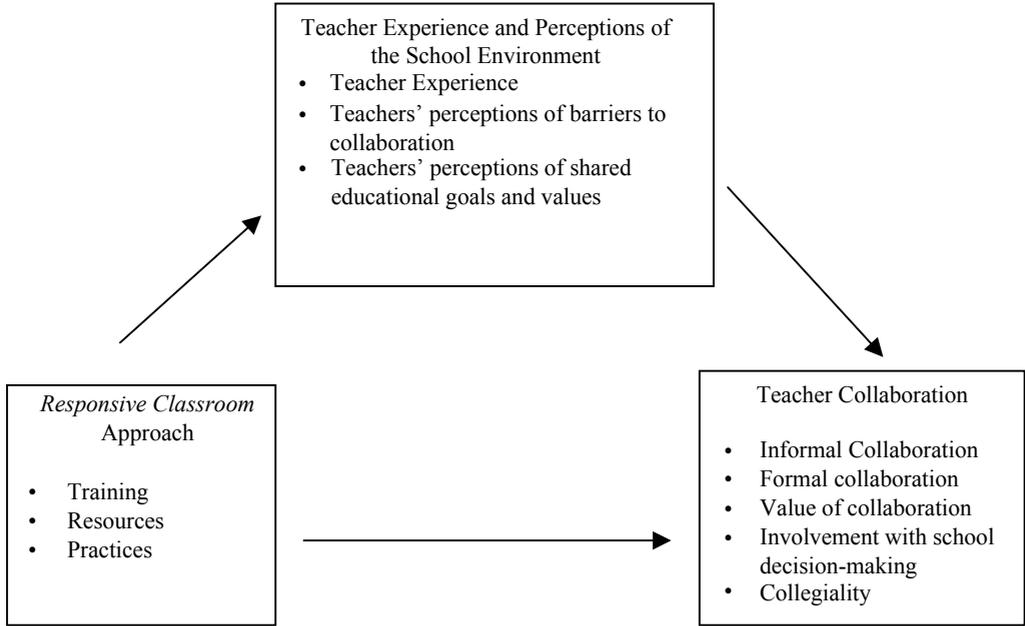
Figure 1.   Hypothetical model of teacher collaboration as framed by a social organizational perspective

Question 3: In what ways do teaching experience and teachers' perceptions of the school environment (i.e., perception of the number of barriers to collaboration and perception of shared educational goals and values) relate to teacher collaboration? We expected greater collaboration among less experienced teachers, teachers who perceived fewer barriers to collaboration (i.e., barriers due to schools' cultures, processes and physical layout) and teachers who reported sharing more goals and values with their colleagues.

Question 4: In what ways does the RC approach relate to teachers' perceptions of the school environment, and could this relation be the mechanism by which the RC approach relates to teacher collaboration? We expected that the RC approach, alone, would not influence teacher collaboration, but that the RC approach would improve teachers' perceptions of the school environment, and in turn, increase teacher collaboration. Thus, we expected that teachers' perceptions of the school would mediate the relation between the RC approach and teacher collaboration.

Methods

Participants

Six public elementary schools in an urban district in the northeast participated in the current study as part of the second year of SALS. Three schools were in their second

year of school-wide RC implementation, and three schools were comparison schools (not implementing the RC approach). The comparison schools were not implementing any school-wide initiatives focused on improving school climate. (Because the district previously had interest in the RC approach, 65 teachers at RC schools and 12 teachers at comparison schools had been trained in the RC approach prior to the start of this study. However, none of the teachers had more than RC introductory level training, and the RC approach was not supported school-wide in any of the schools.)

The schools in the sample were similar demographically. The school district was ethnically and socio-economically diverse. Minority students (African, Asian, Hispanic or Native American) comprised 54% of the student population (between 41.9% and 66.0% at each school) and 37% of students received free/reduced lunch (between 29.6% and 41.2% at each school). Thirty percent of students had a primary language other than English.

All kindergarten through fourth-grade teachers from the six elementary schools (N = 170) were invited to participate. One hundred eighteen of these teachers chose to participate, representing a 69% enrollment rate (58% comparison and 79% RC schools). Table 1 provides the demographic characteristics of all teachers, teachers at comparison school and teachers at RC schools.

Table 1. Teacher characteristics at all schools, comparison schools and RC schools

Teacher characteristics	All schools $n = 118$	Comparison schools $n = 49$	RC schools $n = 69$
Teachers' age			
Mean	39.09	39.19	39.02
Standard deviation	11.84	12.91	11.10
Years of experience			
Mean	11.65	11.31	11.89
Standard deviation	9.91	11.49	8.68
Teachers' gender			
Male	5	3	2
Female	113	46	67
Teachers' ethnicity			
Caucasian	102	43	59
African-American	5	2	3
Hispanic-American	4	0	4
Asian-American	4	3	1
Teachers' education			
Bachelor's degree	118	49	69
Master's degree	103	41	62
RC training			
RC1 training	77	12	65
RC2 training	40	4	36

Design and procedures

By the second year of RC implementation, approximately 94% of the teachers at RC schools had completed RC1 training, a week-long summer program where teachers are taught the principles and components of RC. Approximately half (52%) of the teachers at RC schools had received RC2 training, which occurred over five days in the school year where NEFC trainers expanded faculty's existing knowledge of basic RC components as well as taught new strategies, such as the use of buddy teachers. All trained RC teachers and administrators were also encouraged to attend network meetings, whose purpose was to provide participants with a collaborative environment in which to develop greater facility with the RC components. Also, for the selected RC core teachers, NEFC consulting teachers provided monthly on-site demonstration lessons and observation and coaching services. In the summer, preceding the first year of school-wide RC implementation, RC principals and assistant principals attended the NEFC Responsive Leadership Institute, where they were taught how to initiate and support school-wide and classroom implementation as well as how to build an adult community within their schools.

   In Fall, 2002, all kindergarten through fourth-grade teachers in the six participating schools received a packet by mail containing six questionnaires, five of which were used in the present study, to assess their attitudes, beliefs, and classroom practices. Follow-up recruitment was also conducted through visits to individual schools by the principal investigator and research assistants. Participation was voluntary, and participants received a stipend for completing the questionnaire packet.

   We were interested in gathering qualitative data in order to create a more detailed representation of collaboration within these six schools. Also, as research indicates administrators play a large role in initiating and sustaining collaboration, an understanding of their perceptions of teacher collaboration was important. Principals and program improvement persons (PIPs; administrative staff person whose job is to develop and strengthen curricular programs within the school) were recruited to be interviewed. All of the six principals (four female, two male; five Caucasian, one African-American) chose to participate. Five of the six schools employed a PIP; four of the five PIPs agreed to participate, with one PIP from a RC school declining to participate. All four participating PIPs were female and Caucasian. Telephone interviews were conducted with principals and PIPs. Principals and PIPs were interviewed using a semi-structured format. Participants were informed of the purpose of the interview and reminded of the confidentiality of their answers before the formal interview began. Interviews were approximately 15–20 minutes. All participants consented to the interviews being audio-taped, and all interviews were transcribed.

Measures

Collaboration Questionnaire. The Collaboration Questionnaire was a custom-designed measure consisting of 17 questions to describe collaboration and to understand predictors of collaboration. The Collaboration Questionnaire was piloted with

11 teachers and 2 principals and minor adjustments were made. For descriptive purposes, the questionnaire asked teachers: (1) the topics they collaboratively discuss in both informal and formal settings (e.g., discipline, objective/methods, evaluation, approach with families and the RC approach); (2) the frequency of informal and formal collaboration (i.e., range from not at all to almost daily); (3) the degree to which teachers or administrators control formal collaboration in their school (i.e., range from total administrative control to total teacher control); (4) with whom they collaborate and the value of collaborating with different individuals (e.g., principal or assistant principal, PIPs, regular classroom teacher, special education teachers; i.e., range from not valuable to very valuable); (5) where they are most likely to collaborate (e.g., teachers' lounge, library, individual teachers' classroom); and (6) their degree of satisfaction with their present level of collaboration (i.e., range from very unsatisfied to very satisfied). Mean values were computed, and simple two-tailed *t*-tests were conducted to compare teacher collaboration at comparison and RC schools (research question 1).

Three variables from the Collaboration Questionnaire were used as the teacher collaboration outcome variables in the regression equations (research questions 2 and 3): (1) frequency of informal collaboration (alpha = 0.85); (2) frequency of formal collaboration (alpha = 0.91); and (3) value of collaboration (alpha = 0.88). Means were computed as indicators of teachers' reported frequency of informal and formal collaboration for all topics and value of collaboration. Again, simple two-tailed *t*-tests were conducted to compare teacher collaboration at comparison and RC schools (research question 1).

The Collaboration Questionnaire also asked teachers to report the number of barriers to collaboration they perceived in their school in order to assess their perceptions of the school environment (a potential predictor of collaboration). Teachers were presented with 13 potential barriers to collaboration and asked to rate these barriers on a 0–2 scale (0 = not a barrier and 2 = frequent/significant barrier). These potential environmental barriers included: (1) school culture (seven items; e.g., 'It is difficult to collaborate because it is hard to find adequate words to describe the situation or technique that you want to discuss', and 'I fear that if I ask for help, then other teachers will think I am not effective'), (2) school processes (three items; e.g., 'I do not have enough time during the day in which to collaborate'), (3) school physical layout (one item; e.g., 'The location of my classroom/layout of the school makes it very difficult to collaborate'), and (4) teacher experience (two items; e.g., 'I am a new teacher and I feel I do not have anything to contribute'). To determine teachers' perceptions of school barriers to collaboration, the number of barriers (indicated by a teacher rating of 1 or 2) was summed for each teacher (alpha = 0.70) and this value was used in regressions focused on understanding relations between (a) teacher perceptions of the school environment and (b) collaboration (research question 3) or the RC approach (research question 4).

Teacher Sense of Community Scale.   The Sense of Community Scale (Battistich *et al.*, 1997) was composed of 13 Likert-scale items and used to assess three variables (alpha

= 0.89): (a) faculty collegiality (seven items; e.g., 'There is a great deal of cooperative effort among staff members'; alpha = 0.88), (b) teacher involvement in school decision-making (four items; e.g., 'The principal usually consults with staff before he/she makes decisions that affect us'; alpha = 0.89), and (c) shared educational goals and values (two items; e.g., 'Most of my colleagues share my beliefs and values about what the central mission of the school should be'; alpha = 0.60). Teachers rated their agreement to a provided statement on a scale of 1 (strongly disagree) to 5 (strongly agree). The subscale of shared educational goals and values was used as a predictor of teacher collaboration (research questions 3 and 4), and the subscales of faculty collegiality and teacher involvement in school decision-making were used as outcome (collaboration) variables (research questions 2 and 3). Mean values were computed for each subscale, with reversal of negative items where appropriate.

Classroom Practices Questionnaire.   The Classroom Practices Questionnaire was used to assess RC implementation, specifically to determine individual teachers' use of RC practices. We were interested in whether teachers who more fully implemented RC practices may be committed to collaboration. The Classroom Practices Questionnaire was a custom-designed measure, composed of 43 items (alpha = 0.92). Thirty-nine items provided teachers with two poles. One pole provided an example of a classroom practice that was not characteristic of the RC approach (e.g., 'Teacher uses praise and reward to reinforce the rules'), while the other pole provided an example of a classroom practice that was characteristic of the RC approach (e.g., 'Teacher reminds, reinforces and redirects children in their practice of the rules'). Classroom practices were not described using RC terminology, so as not to bias teachers' responses. Teachers rated themselves on a scale of 1–5 reflecting their practice in relation to the two poles, with higher numbers reflecting practices more consistent with the RC approach. The 39 items asked teachers about the following classroom practices: (1) hand signals; (2) classroom opening exercises; (3) classroom rules and consequences; (4) classroom organization; (5) introduction of materials; (6) student choice; (7) student reflection; (8) assessment and parent communication; (9) time-out; (10) problem-solving class meetings; and (11) sense of community. (The five items measuring sense of community were excluded because they provided redundant information.)

   The remaining four items were open response questions, which queried teachers about their classroom management and discipline strategies. The open response items were also coded on a 1–5 scale such that higher numbers reflected more consistency with RC practices. Two raters demonstrated an 85% or above agreement level for these open response items. Mean values were computed based on the 38 included items to indicate teachers' degree of RC implementation (research questions 2 and 4).

Teacher Resources Questionnaire. The Teacher Resources Questionnaire was a custom-designed measure which asked teachers to identify the degree of RC training

and exposure to RC resources they had received. The two composite variables created from this measure were (1) RC training (e.g., none, RC1, RC2) and (2) RC resources (e.g., reference to RC books and website, participation in network meetings and consultation with RC trainers). We hypothesized that teachers who had more training and more utilized resources were more committed to the RC approach and thus may be more committed to teacher collaboration. Higher numbers indicated more training and more usage of RC resources. To indicate reported degree of RC training, the number of different levels of training teachers attended were summed (e.g., 0 = no training and 2 = attended 2 levels of training, such as RC1 and RC2). Mean values were computed as an indicator of reported use of RC resources (research questions 2 and 4).

Teacher Demographic Questionnaire.   The Teacher Demographic Questionnaire was a custom-designed measure consisting of 12 items (e.g., gender, age, race, marital status, level of education, years of experience, etc). The current study only utilized one item, which asked teachers the number of years of experience they had in teaching (research questions 3 and 4).

Principal and PIP interviews.   The purpose of the principal and PIP interviews was to support and better understand the quantitative findings. Questions were designed to elicit (1) how administrators defined teacher collaboration (i.e., 'How do you define teacher collaboration?'); (2) the types of collaboration teachers engaged in and with whom (i.e., 'In what ways are teachers collaborating in your school?' [Prompts: topics, formally/informally, with whom, how often]); and (3) the means (if any) by which the administration promoted and/or supported collaboration in their schools (i.e., 'In what ways do you promote teacher collaboration in your school?'; and the following questions to principals only, 'What characteristics or qualifications are most important to you when hiring new teachers for your school?' and 'Are current teachers involved in the hiring process? If so, in what way?').

Data analysis

In the present study, both quantitative data (collected through teacher self-report questionnaires) and qualitative data (principal and PIP interviews) were collected. The primary analysis was quantitative, with the qualitative data being used to support the quantitative findings.

Distributions were checked for the degree to which they were normally distributed and met assumptions of homoscedasticity. Outliers and issues of multicollinearity were addressed using procedures in Tabachnick and Fidell (2001). Outliers were adjusted to not exceed two standard deviations below or above the mean. If the correlation between any variables was above 0.5, variance inflation factor (VIF) and tolerance statistics were computed to determine if multicollinearity posed an analytic

problem; no multicollinearity problems existed. Descriptive analyses (i.e., means, ranges, standard deviations) and correlation coefficients were computed.

Description of teacher collaboration

Descriptive statistics (by all schools, comparison schools and RC schools) were calculated for: (1) frequency of informal collaboration; (2) frequency of formal collaboration; (3) administrative versus teacher control over formal collaboration; (4) teacher satisfaction with current level of collaboration; (5) level of value teachers place on collaboration; (6) number of barriers to collaboration reported; (7) teachers' perception of their level of involvement with school decision-making; and (8) teachers' sense of collegiality in their schools. Simple two-tailed *t*-tests were conducted to compare teacher collaboration at RC and comparison schools. Effect size Cohen *d* values were computed based on *t*-values, as described in Rosenthal & Rosnow (1991), where $d = 0.20$, 0.50 and 0.80 were considered small, medium and large effect sizes, respectively. Interview responses from principals and PIPs provided qualitative support for the quantitative findings.

Predictors of teacher collaboration

Predictor questions were analyzed following the steps outlined by Baron and Kenny (1986) to establish mediation. In order to calculate effect size of select variables, individual R^2 values were computed. Each regression equation was conducted with (i.e., full model) and without (i.e., partial model) the variables that were hypothesized to be significant predictors of the outcomes. The effect size of the select variable was calculated by subtracting the R^2 value of the partial model equation from the R^2 value in the full model equation.

Step 1: Relation between RC implementation and teacher collaboration.   Five separate two-step regression analyses were conducted, one for each of the following dependent variables (i.e., frequency of informal collaboration, frequency of formal collaboration, value of collaboration, involvement in school decision-making and sense of collegiality). The first step included school type (1 = comparison and 2 = RC) and the second step considered the contribution of the three RC implementation variables (i.e., training, resources and practices) after controlling for the contribution of school type.

   Interactions between school type and the three RC implementation variables were entered into the regression equations as a third step. The interaction variables were centered (i.e., converted to deviation scores by subtracting the mean from the raw score) to reduce problems of multicollinearity as suggested by Tabachnick and Fidell (2001). Despite centering the variables, multicollinearity posed an analytic problem. Thus, the interactions were excluded from analyses.

Step 2: Relation between RC implementation and teachers' perceptions of the school environment. Two separate two-step regression analyses were conducted, one for each of the following dependent variables (i.e., teacher perceptions of the school barriers to collaboration and teachers' perceptions of the school's shared educational goals and values). Again, the first step included school type, and the second step included the three RC implementation variables. No interactions were computed as there was no *a priori* hypothesis to test.

Because no RC implementation variables were significant predictors of teachers' perceptions of environmental variables, the mediation model was not supported, and the remaining steps to determine mediation were discontinued. The relation between RC implementation and teachers' perceptions of the school environment will be discussed in greater detail in the results section.

Step 3: Relation between teacher experience, teachers' perceptions of the school environment and teacher collaboration. Despite limited relation between RC implementation and teachers' perceptions of the school environment (ruling out the mediation hypothesis), the relation between teacher experience and teachers' perceptions of the school environment and collaboration was still of interest; thus, five separate two-step regression analyses were still conducted, one for each of the following dependent variables (i.e., frequency of informal collaboration, frequency of formal collaboration, value of collaboration, involvement in school decision-making and sense of collegiality). The first step included teaching experience as this was believed to be the most proximal variable for teachers; experience is most closely related to teachers' practices and beliefs (e.g., Hargreaves, 1984). The second step included teachers' perceptions of barriers and shared goals and values.

Results

Correlations between variables

Table 2 presents the correlations between each pair of variables (i.e., school type, RC implementation, perceptions of school environment and teacher experience and teacher collaboration). The three RC implementation variables were positively correlated with one another; correlations ranged from 0.51 to 0.62 ($p < .01$), suggesting that teachers who were trained in the RC approach used RC resources and practices. School type was also positively correlated with the three RC implementation variables; correlations ranged from 0.46 to 0.67 ($p < .01$), signifying that greater numbers of teachers at RC schools had been trained in the RC approach and were using RC resources and practices. School type correlated positively with amount of formal collaboration ($r = 0.19$, $p < .05$), showing that teachers at RC schools reported more formal collaboration than did teachers at comparison schools.

In regard to teachers' perceptions of the school environment, teachers' reports of number of barriers and shared educational goals and values were inversely correlated ($r = -0.28$; $p < .01$), suggesting that teachers who perceived fewer barriers to

Table 2.   Correlation coefficients among school type, RC implementation, teacher experience and teachers' perceptions and teacher collaboration

	m	SD	2	3	4	5	6	7	8	9	10	11	12
School type													
1. School type	...	...	0.67**	0.61**	0.46**	0.03	0.02	−0.13	0.03	0.19*	−0.03	−0.03	−0.16
RC implementation													
2. RC training	1.03	0.90	...	0.62**	0.51**	0.11	−0.03	−0.05	0.09	0.18	−0.07	−0.01	−0.04
3. RC resources	1.74	0.72		...	0.58**	0.10	−0.05	0.01	0.24*	0.33**	0.10	0.11	0.07
4. RC practices	3.92	0.58			...	−0.09	−0.22*	0.06	0.22**	0.38**	0.21*	0.29**	0.10
Teacher experience and perceptions													
5. Total years teaching experience	11.65	9.91				...	−0.06	0.16	−0.02	−0.07	−0.14	−0.10	0.08
6. Number of barriers	3.10	2.09					...	−0.28**	−0.32**	−0.35**	−0.35**	−0.25**	−0.32**
7. Shared educational goals/values	3.39	0.81						...	0.28**	0.23*	0.35**	0.43**	0.67**
Teacher collaboration													
8. Amount of informal collaboration	3.16	1.12							...	0.66**	0.41**	0.16	0.38**
9. Amount of formal collaboration	1.88	1.02								...	0.40**	0.29**	0.30**
10. Value placed on collaboration	2.73	0.60									...	0.27**	0.49**
11. Teacher involvement in school decision-making	2.71	0.94										...	0.29**
12. Sense of collegiality	3.33	0.58											...

*p < .05; **p < .01; ***p < .001

collaboration reported a greater sense of shared educational goals and values in their schools.

Four of the five teacher collaboration variables were correlated significantly. Statistically significant correlations ranged from 0.27 to 0.66 ($p < .01$), suggesting that those teachers who collaborated also reported valuing collaboration, participating in school decision-making, and perceiving a sense of collegiality in their school.

Goal 1: description of teacher collaboration.   Table 3 describes the frequency of teacher collaboration, displaying means, standard deviations, and *t*-test results comparing RC and comparison schools. Teachers collaborated approximately twice a month in informal settings and once a month in formal settings. No significant difference for informal collaboration existed between teachers in comparison and RC schools, but teachers at RC schools reported collaborating more frequently in formal settings than teachers at comparison schools. As illustrated in Figure 2, teachers collaborated more frequently on student-centered topics, such as (1) curriculum materials; (2) discipline; (3) activities; (4) individualization (i.e., learning problems of individual students); and (5) for RC teachers, the RC approach; collaboration occurred approximately three times per month about curriculum materials and approximately two times per month on the other student-focused topics. Teachers collaborated less often (approximately once a month or slightly less) on teacher-focused topics, such as (1) objectives/methods; (2) evaluation; (3) approach with families; and (4) room organization.
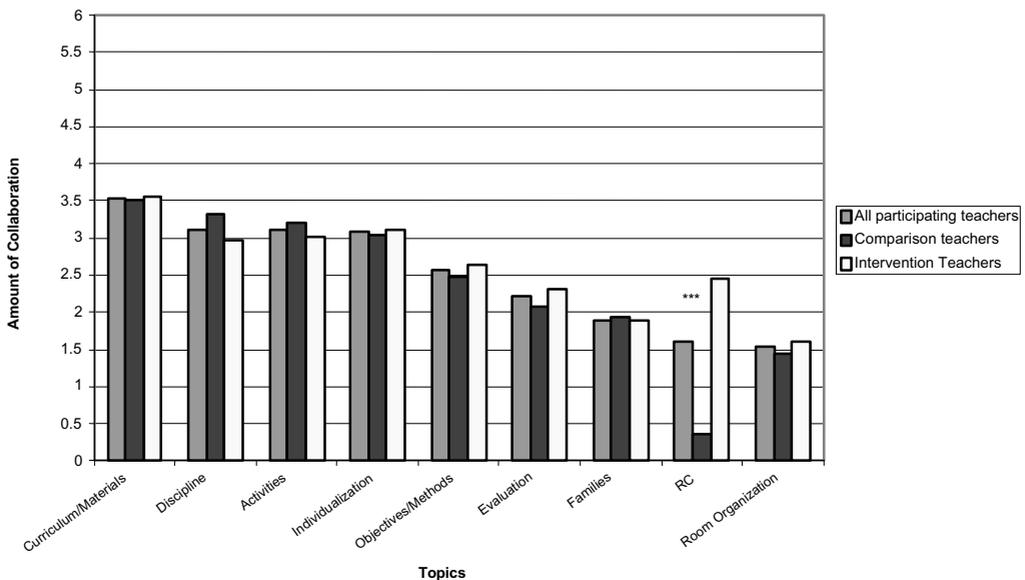
Notes. Range 0-6; 0=not at all, 1=once every 2-3 months, 2=once a month, 3=twice a month, 4=once a week, 5=twice a week, 6=almost daily
Significant differences between comparison and intervention teachers indicated by: *** p < .001

Figure 2.   Amount of collaboration on specified topics

Table 3.   Frequency of teacher collaboration at RC and comparison schools

Frequency	All teachers	Comparison teachers	RC teachers	t	Df	Sig.	Cohen d
Amount of informal collaboration				−0.29	116	n.s.	0.05
Mean	3.16	3.12	3.18				
Standard deviation	1.12	1.01	1.21				
Amount of formal collaboration				−2.08	116	0.04	0.39
Mean	1.88	1.66	2.05				
Standard deviation	1.02	0.96	1.03				

Notes. For categories amount of informal and formal collaboration, 0 = not at all, 1 = once every 2–3 months, 2 = once a month, 3 = twice a month, 4 = once a week, 5 = twice a week and 6 = almost daily.

One significant difference emerged between comparison and RC schools in relation to the topic of collaboration; teachers at RC schools collaborated more frequently about the RC approach than comparison school teachers. Also, one-way ANOVAs were calculated to determine whether there were differences in frequency or valuing of collaboration between the five grade levels (K-4th grade). No statistical differences existed, and thus, grade level was excluded from subsequent analyses.

Table 4 describes the characteristics of collaboration, showing means, standard deviations and *t*-test results comparing RC and comparison schools. (Note: degrees of freedom vary due to teachers' missing responses for items.) Teachers reported that the administrators held the majority of control over formal collaboration, signifying that formal collaboration was more administrator-initiated than teacher-initiated. In regard to their satisfaction with their current level of collaboration, teachers generally expressed ambivalence; they reported they felt 'not satisfied, but not unsatisfied', representing the middle of the range of responses. On average, teachers reported that collaboration with their colleagues was slightly less than 'valuable', but more than 'somewhat valuable'. Teachers in RC schools reported more barriers to collaboration than teachers in comparison schools. Teachers perceived a somewhat low degree of involvement in decision-making and a moderate sense of collegiality within their school.

Other interesting findings not depicted in Table 4 include teachers' preferences for with whom and where they prefer to collaborate. Teachers preferred to collaborate with regular classroom teachers, more specifically with classroom teachers of the same grade. The colleagues with whom teachers least tended to collaborate were the guidance counselor and PIP. The most frequent location for collaborating was an individual teacher's classroom, and the least frequent location was the school library.

On average, teachers reported only two (of 13) barriers to collaboration (0–2 scale, where 0 = not a barrier and 2 = frequent/significant barrier). Teachers reported that lack of time, both personal (i.e., 'I do not have enough time during the day in which to collaborate'; $m = 1.42$, SD = 0.67) and for colleagues (i.e., 'I would like to collaborate more, but I feel like fellow teachers/administrators are not willing to "give up"

Table 4.   Characteristics of teacher collaboration at RC and comparison schools

Characteristics of collaboration	All teachers	Comparison teachers	RC teachers	t	df	Sig.	Cohen d
Control over formal collaboration				0.16	95	n.s.	0.03
Mean	1.90	1.92	1.90				
Standard deviation	0.80	0.81	0.81				
Satisfaction with collaboration				−1.24	101	n.s.	0.25
Mean	3.26	3.11	3.28				
Standard deviation	1.09	1.07	1.11				
Value placed on collaboration				0.28	116	n.s.	0.05
Mean	2.73	2.74	2.71				
Standard deviation	0.60	0.61	0.61				
Number of barriers reported				2.94	116	0.00	0.55
Mean	3.10	2.98	3.12				
Standard deviation	2.09	1.88	2.25				
Teacher involvement with school decision-making				0.30	115	n.s.	0.06
Mean	2.71	2.74	2.69				
Standard deviation	0.94	0.95	0.94				
Sense of collegiality				1.77	116	n.s.	0.33
Mean	3.33	3.44	3.25				
Standard deviation	0.58	0.61	0.55				

Notes. For control over collaboration, 1 = administration in control, 3 = share control and 5 = teachers are in control.
For satisfaction with collaboration, 1 = very satisfied, 3 = not satisfied, but not unsatisfied and 5 = very satisfied.
For value of collaboration, 0 = not valuable, 1 = hardly valuable, 2 = somewhat valuable, 3 = valuable and 4 = very valuable.
For involvement with school decision-making and sense of collegiality, 1 = strongly disagree, 2 = disagree, 3 = neither agree/disagree, 4 = agree and 5 = strongly agree.

the time to do so'; $m = 0.74$, SD $= 0.70$), and lack of administrative priority (i.e., 'The administration does not prioritize collaboration within our school'; $m = 0.67$, SD $= 0.72$) were the primary barriers to collaboration. The least reported barrier to collaboration was lack of a shared educational language (i.e., 'It is difficult to collaborate because it is hard to find adequate words to describe the situation or technique that you want to discuss'; $m = 0.07$, SD $= 0.29$). No significant differences in teachers' report of barriers to collaboration existed between comparison and RC schools.

Notably, teachers at RC schools reported more formal collaboration than teachers at comparison schools. Few differences at the school level were found between comparison and RC schools, and none were found between different grade levels.

Goal 2: RC implementation and teacher collaboration.   Table 5 illustrates the five two-step regression analyses computed to determine the relation between RC implementation and teacher collaboration. First, these findings show greater formal collaboration at RC than comparison schools (individual $R^2 = 0.036$). After controlling for the contribution of school type, teachers' reported use of RC resources (e.g., network meetings, books and materials) was associated with frequency of informal collaboration (individual $R^2 = 0.038$). Also, after accounting for school effects, teachers who reported using more RC practices reported more frequent formal collaboration (individual $R^2 = 0.061$), placed greater value on collaboration (individual $R^2 = 0.052$) and greater involvement in decision-making (individual $R^2 = 0.097$). These findings suggest that above and beyond teaching at an RC school, those teachers who more thoroughly adopt RC classroom practices collaborated more frequently.

Goal 3: teacher experience, teachers' perceptions of the school environment and teacher collaboration.   Table 6 illustrates the five two-step regression analyses computed to determine the relation between teacher experience, teachers' perceptions of the school environment and teacher collaboration. As expected, these analyses revealed a pattern pointing to the importance of shared goals and values and the perception of few barriers in predicting collaboration. Teachers who reported high sharing of goals and values reported more frequent informal collaboration (individual $R^2 = 0.044$), greater valuing of collaboration (individual $R^2 = 0.071$), more involvement in school decision-making (individual $R^2 = 0.127$) and more collegiality (individual $R^2 = 0.363$). Teachers who perceived fewer barriers to collaboration reported more frequent informal collaboration (individual $R^2 = 0.042$) and formal collaboration (individual $R^2 = 0.068$) and greater valuing of collaboration (individual $R^2 = 0.070$).

Goal 4: RC implementation and teachers' perceptions of the school environment.   The fourth goal was to determine whether teachers' perceptions of the school environment played a mediating role in the relation between RC implementation and teacher collaboration, with the expectation that teachers' perceptions mediated the relation between RC implementation and teacher collaboration. Consistent with Baron and

Table 5. Two-step regression analyses examining the relation between RC and teacher collaboration

Dependent and independent variables	F change	Block sig.	Change in R^2	Beta	At each step t	Sig.
Amount of informal collaboration						
Step 1: school type	0.08	n.s.	0.001			
RC or comparison				0.03	0.29	n.s.
Step 2: RC implementation	3.94	0.01	0.10			
RC training				−0.05	−0.34	n.s.
RC resources				0.28	2.18	0.03
RC practices				0.17	1.51	n.s.
Amount of formal collaboration						
Step 1: school type	4.34	0.04	0.04			
RC or comparison				0.19	2.08	0.04
Step 2: RC implementation	5.95	0.000	0.13			
RC training				−0.11	−0.90	n.s.
RC resources				0.22	1.78	n.s.
RC practices				0.31	2.88	0.01
Value placed on collaboration						
Step 1: school type	0.08	n.s.	0.001			
RC or comparison				−0.03	−0.28	n.s.
Step 2: RC implementation	3.69	0.03	0.09			
RC training				−0.24	−1.85	n.s.
RC resources				0.13	0.98	n.s.
RC practices				0.29	2.54	0.01
Teacher involvement with decision-making						
Step 1: school type	0.09	n.s.	0.001			
RC or comparison				−0.03	−0.30	n.s.

Table 5.   (Continued)

Dependent and independent variables	F change	Block sig.	Change in R^2	Beta	At each step t	Sig.
Step 2: RC implementation	5.36	0.004	0.13			
RC training				−0.16	−1.19	n.s.
RC resources				0.06	0.50	n.s.
RC practices				0.40	3.54	0.001
Sense of collegiality						
Step 1: school type	3.14	n.s.	0.03			
RC or comparison				−0.16	−1.77	n.s.
Step 2: RC implementation	2.40	0.04	0.06			
RC training				0.02	0.12	n.s.
RC resources				0.20	1.50	n.s.
RC practices				0.14	1.23	n.s.

Table 6.   Two-step regression analyses examining the relation of teacher experience, teacher perceptions and teacher collaboration

Dependent and independent variables	F change	Block sig.	Change in R^2	Beta	At each step t	Sig.
Amount of informal collaboration						
Step 1: teacher experience	0.06	n.s.	0.001			
Total years of teaching experience				−0.02	−0.24	n.s.
Step 2: teacher perceptions	7.26	0.003	0.12			
Perception of barriers				−0.21	−2.27	0.03
Shared goals and values				0.22	2.33	0.02
Amount of formal collaboration						
Step 1: teacher experience	0.50	n.s.	0.004			
Total years of teaching experience				−0.07	−0.70	n.s.
Step 2: teacher perceptions	6.85	0.004	0.11			
Perception of barriers				−0.27	−2.88	0.01
Shared goals and values				0.14	1.46	n.s.
Value placed on collaboration						
Step 1: teacher experience	2.11	n.s.	0.02			
Total years of teaching experience				−0.14	−1.45	n.s.
Step 2: teacher perceptions	13.36	0.000	0.20			
Perception of barriers				−0.28	−3.10	0.002
Shared goals and values				0.28	3.14	0.002
Teacher involvement with decision-making						
Step 1: teacher experience	1.16	n.s.	0.01			
Total years of teaching experience				−0.10	−1.08	n.s.
Step 2: teacher perceptions	13.14	0.000	0.20			
Perception of barriers				−0.15	−1.64	n.s.
Shared goals and values				0.38	4.14	0.000
Sense of collegiality						

Table 6. *(Continued)*

Dependent and independent variables	*F* change	Block sig.	Change in R^2	*Beta*	At each step *t*	Sig.
Step 1: teacher experience	0.72	n.s.	0.01			
Total years of teaching experience				0.08	0.85	n.s.
Step 2: teacher perceptions	45.48	0.000	0.45			
Perception of barriers				−0.14	−1.83	n.s.
Shared goals and values				0.63	8.52	0.000

Kenny's (1986) first step for determining mediation, RC implementation was related to teacher collaboration (i.e., the second goal of the study).

The second step in determining a mediation model was to test the relation between RC implementation and teachers' perceptions of the school environment, as shown in the two two-step regression analyses in Table 7. The omnibus F test showed no significant results from the regression analyses. Without the existence of a relation between RC implementation and teachers' perceptions of the school environment, teachers' perceptions could not play a mediating role between RC implementation and teacher collaboration.

Although it is noteworthy that teachers who reported using more RC practices reported fewer barriers to collaboration, the regression model was not significant. Thus, further interpretation is not warranted.

Discussion

Two sets of findings emerge from this study. The first set of findings describes the frequency and characteristics of teacher collaboration. The most typical pattern is that teachers collaborated with fellow teachers about student-centered topics approximately once or twice per month. Teachers in RC schools reported more frequent formal collaboration than comparison school teachers, and teachers reported the two main barriers to collaboration as being lack of time and lack of administrative priority. The second set of findings identified patterns of predictors of teacher collaboration. Teachers' perceptions of the school environment, specifically perception of shared educational goals and values and perception of fewer barriers, related positively to teacher collaboration. Above and beyond the effect of teaching at an RC school, teachers who reported using more RC practices and/or resources appear to collaborate more and value collaboration to a higher degree.

This article offers a snapshot of teacher collaboration in six schools characterized by high demands for accountability as well as a high percentage of children 'at-risk' of school failure based on socioeconomic disadvantages and limited English proficiency. These findings point to the utility of an intervention, the RC approach, for both increasing the frequency of teacher collaboration as well as increasing teachers' perceptions of the value of teacher collaboration. Thus, these findings offer a richer understanding of teacher collaboration as a social process underlying the development of an academic learning community. Further, this work suggests the utility of the RC approach for fostering the growth of learning communities in schools.

Description of teacher collaboration

Results show that the typical teacher collaborated more frequently in informal settings (i.e., twice per month) than in formal settings (i.e., once per month), a finding consistent with previous research (Miskel *et al.*, 1983; Louis, 1992).

When teachers collaborated informally, they did so at varying times, as expected by prior research (Little, 1982). Principal and PIPs' comments supported this finding;

Table 7. Two-step regression analyses examining the relation between RC and teacher perceptions

Dependent and independent variables	F change	Block sig.	Change in R^2	Beta	At each step t	Sig.
Perception of barriers						
Step 1: school type	0.06	n.s.	0.00			
RC or comparison				0.02	0.05	n.s.
Step 2: RC implementation	2.72	n.s.	0.07			
RC training				0.03	0.19	n.s.
RC resources				0.03	0.26	n.s.
RC practices				−0.31	−2.68	0.01
Shared educational goals/values						
Step 1: school type	1.85	n.s.	0.02			
RC or comparison				−0.13	−1.36	n.s.
Step 2: RC implementation	0.80	n.s.	0.02			
RC training				−0.01	−0.06	n.s.
RC resources				0.09	0.67	n.s.
RC practices				0.11	0.94	n.s.

two principals mentioned teachers informally collaborate frequently during lunch time and after school, while a PIP remarked that teachers pair up to work during the instructional school day on projects with their classrooms (e.g., a kindergarten class and a fifth-grade class pairing up and doing reading).

Teachers in RC schools reported more frequent collaboration in formal settings than did teachers in comparison schools. This finding is significant in that it reflects the success of the RC approach in developing formal structures to support and encourage collaboration. Examples of such structures include home groups, system of buddy teachers and collaborative meetings for core group teachers (NEFC, 2001). One principal at a RC school explained home groups as, 'teachers from different grade levels meet[ing] together as one school community'. The collaborative nature of home groups is illustrated by a PIP who commented, 'the home groups have a balance of trained and non-trained teachers in them, so that when we're presenting *RC* strategies the teachers that have experience can share their experience and the teachers that don't have the experience with it can gain some understanding of it'.

The results show that teachers collaborated more on student-focused topics (i.e., curriculum and materials, discipline, activities, individualization, and for RC teachers, the RC approach) and less on teacher-focused topics (i.e., objectives/methods, evaluation, approach with families and room organization). This finding corresponds to a qualitative study on teacher collaboration which found that teachers more frequently collaborated on topics concerning students (Zahorik, 1987). One RC school principal described such student-focused collaboration (specifically the RC approach and discipline), 'We also, as you know, are implementing *RC* … so there's a lot of collaboration regarding strategies to improve social behavior and classroom behavior and teacher management skills'.

Teachers tended to collaborate with fellow teachers, specifically teachers in their same grade level. This finding was consistent with work describing that teachers would rather collaborate with fellow teachers than administrators (Lortie, 1975; Miskel *et al.*, 1983; Zahorik, 1987) and inconsistent with other work revealing no differences in collaboration preferences (e.g., Pellegrin, 1976). Two principals supported the finding by remarking that teachers in their school want to 'remain with their grade level team' and 'want to be trained as a grade level'.

Lack of time (both personal and perceived lack of time for colleagues) and lack of administrative priority were reported by teachers as two key barriers to collaboration, a finding concordant with research stressing that teachers must be given time to collaborate and the administration must make collaboration a priority (e.g., Alfonso & Goldsberry, 1982; Little, 1999; McLaughlin & Talbert, 2001). Lack of time as a barrier was also frequently mentioned in the interviews with principals and PIPs. For example, one principal stated, 'Well, we do [collaborate] but it's very difficult with the time constraints'.

It was surprising that RC teachers reported more barriers to collaboration than comparison school teachers. As collaboration is emphasized in RC, RC teachers may be more aware of the need to collaborate and thus are more aware of the barriers to this goal; barriers may not be as resonant with comparison school teachers. Another

explanation could be that teachers perceived the collaborative structures initiated by the administration in RC schools as being less preferable to more teacher-controlled/initiated collaboration. More qualitative data collection strategies would need to be employed to determine the reason(s) for this finding.

Teachers reported that they felt limited involvement in school decision-making, with the administration granting them low levels of participation in decision-making and planning. Interestingly, each of the six principals mentioned involving teachers in school decisions. For example, one principal defined teacher collaboration as being involved in school decision-making, 'Currently our teachers are part of all initiatives. … They are a part of any decision-making regarding grants that come into the building and how those grants are to be implemented'. Other principals mentioned teacher involvement in such school decisions as writing the mission statement, having input into their teaching assignments, and voting on participation in educational initiatives. In studying teachers' beliefs, attitudes and behaviors, understanding teachers' perceptions of the school organization is more critical than knowing the true objective reality of the situation (Imants & Bakkenes, 1993). It may be that teachers perceive these administrative attempts to involve them in school decision-making as superficial. Teachers may believe their input is not given weight when administrators make the final decisions.

Predictors of teacher collaboration

Perceptions of the school environment.   Overall, those teachers who perceive their school environment as more conducive to teacher collaboration report increased collaboration. Teachers who reported fewer barriers to collaboration reported more frequent collaboration in both informal and formal settings, and teachers who reported sharing more educational goals and values with their colleagues reported collaborating more frequently in an informal setting. It may be that teachers who actively seek opportunities to collaborate (i.e., more frequent collaboration) are less likely to perceive barriers, and teachers are more willing to collaborate frequently with those teachers who share their educational goals and values (Nias *et al*., 1989; Fullan & Hargreaves, 1996; Reinken, 1998). Research points to the bidirectionality of the relation between similar goals and values and collaboration, where similar goals and values may also be an outcome of collaboration (Rosenholtz, 1985; Nias *et al*., 1989; Talbert & McLaughlin, 1996). A PIP noted collaboration is more fruitful when colleagues share educational goals and values: 'I see certain grade levels that meet and work effectively and on the same page with their instruction … they have the same philosophical bent'.

It is interesting to note that shared educational goals and values were related to informal but not to formal collaboration. Informal collaboration tends to be teacher-initiated, while formal collaboration tends to be driven by the administration (as evidenced by teachers' report in the Collaboration Questionnaire that the administration was mostly in control over formal collaboration). This may indicate that when the administration mandates collaboration, teachers are more likely to go through the

motions for appearance sake and hence there are fewer shared educational goals and values (Garmston, 1987; Hargreaves, 1994). Hargreaves (1994) describes collegiality that is administratively regulated and compulsory as contrived; in order for collaboration to be sustainable, the administration needs to be flexible and responsive to teachers' needs resulting in the facilitation, not control of, collaboration (Little, 2003).

Also, teachers who reported sharing more educational goals and values with their colleagues reported increased perception of collegiality in their schools. It is intuitive to think that teachers feel more connected to colleagues who subscribe to their same educational philosophy (Nias *et al.*, 1989).

The RC approach. Our data suggest that the RC approach influences teacher collaboration via two distinct mechanisms: (1) RC schools provide structures to increase the frequency of teacher collaboration and (2) teachers who more fully use the RC approach have more assimilated RC's mission of developing a school-wide community.

RC structures. RC school teachers and teachers who reported using more RC practices reported more frequent formal collaboration than comparison school teachers. Through the creation of formal structures, such as home groups and network meetings, the RC approach prioritizes collaboration (NEFC, 2001). More than 80% of teachers in RC schools reported that the administration provides time for small groups of teachers to meet (e.g., home groups and grade level meetings) as compared to slightly more than half of teachers in comparison schools, showing that RC schools created more formal collaboration opportunities for teachers. Also, according to the principals, teachers who are high in RC practices are more likely to be appointed into the RC core group, a structure which actively promotes formal teacher collaboration.

Teachers who reported more use of RC resources more frequently engaged in informal collaboration. Many of the RC resources emphasize the need to collaborate (e.g., sharing of educational goals and values and collective reflection of practices). Teachers who utilized RC resources, such as consultations with RC trainers and colleagues, may have developed more collaborative mindsets. Teachers who recognized the importance of collaboration may have been more apt to engage in more frequent informal collaboration.

To increase collaboration, the RC approach has formal structures in place to assist teachers in creating and sustaining professional relationships with colleagues (NEFC, 2001). This training is quite distinct from most teachers' previous teacher preparation and professional development. Previous research describes that teachers are rarely taught to collaborate (Lortie, 1975; Copeland & Jamgochian, 1985; Hudson & Glomb, 1997; Friend, 2000; Fullan, 2001). A statement from an RC school principal illustrates how the RC approach differs from conventional training: 'Teachers are autonomous individuals. There's nothing in their training as an undergraduate or graduate student that teaches them to collaborate. They're given

numerous opportunities to collaborate, but they're never taught how to collaborate. We spend a lot of time teaching people to collaborate'. When a school implements the RC approach, they commit to training teachers how to collaborate. Further, they commit to creating structures in the schools that promote the initiation and sustainability of collaboration.

Belief in school-wide community.   Teachers who used more RC practices reported valuing collaboration more highly. This finding suggests a relation between RC implementation (as measured by RC classroom practices) and adoption of one of the basic elements of the RC belief system, the value of teacher collaboration (NEFC, 2001). It appears that teachers who have progressed to a fuller implementation of RC practices hold beliefs that are consistent with RC principles. This correspondence is consistent with research on school change, which points to the reciprocal nature of beliefs and practices (e.g., Fullan, 1991; Evans, 1996). Thus, it could be that teachers who were most committed to the RC approach and its focus on establishing a stronger adult community were developing a stronger belief in the value of collaboration. Another explanation is that teachers who already had a stronger belief in the value of collaboration were more likely to adopt RC practices because of the consistency between RC and the teachers' values. Teachers who reported using more RC practices reported being more involved in school decision-making. A primary means to accomplish the RC approach's school-wide community goal is to involve teachers in school-wide decision-making (Newmann *et al.*, 1989; Louis *et al.*, 1996). One way in which RC schools encourage teacher involvement in decision-making is through the core group of teachers, who hold increased responsibility in the school through the training and consultation of other staff. This finding points to the contribution of the RC approach in increasing teacher involvement in decision-making through this mechanism.

Lack of mediation

Our model hypothesized that teachers' perceptions of the school environment played a mediating role in the relation between RC implementation and teacher collaboration. We hypothesized that RC implementation would improve teachers' perceptions of the school environment and in turn, increase teacher collaboration. However, this was not borne out in the current study, as the relation between RC implementation and teachers' perceptions of the school environment was weak. The mechanism explaining the relation between the RC approach and teacher collaboration may not have been measured in this study. The qualitative findings suggest that future research consider principals' priorities and structuring and quality of meetings between teachers.

Limitations

Four limitations require explanation. First, due to the primacy of the quantitative design, this study assesses the *quantity* of collaboration more effectively than the

quality of collaboration. Existing research indicates a continuum of rigor in collaboration, ranging from sharing quick anecdotes to working extensively with colleagues (Little, 1990), variability not captured by the present study. The second limitation was that the sample did not include teachers in schools which were fully implementing RC. The three RC schools had only been implementing the RC approach for two years, and not all teachers had completed basic RC training. School-wide implementation of the RC approach is typically viewed as a three- to five-year process, and two years may not be enough time to fully illustrate the contribution of the RC approach. The third limitation was the study's reliance on self-report data from teachers. This is especially relevant in RC schools where teachers may have perceived administrative pressure to implement RC practices and thus rated themselves higher on the Classroom Practices measure. The fourth limitation was the lack of baseline data on teacher collaboration within the six schools prior to the implementation of the RC approach. We have interpreted our data to indicate that the RC approach is related to higher levels of collaboration. However, it could be that these schools were already collaborating at a higher level and the RC approach may be more responsible for sustaining, rather than initiating, this practice.

Implications and future directions

> The advantages of collaboration certainly I think when you allow people to come together and you get your best and brightest thinkers together, you're stretching the possibilities for students and for what a school can provide as an educational institution. (RC School Principal)

As exemplified by the principal's quote, collaboration has important implications for teachers, students and schools. The current study adds to the understanding of teacher collaboration and its antecedents, contributing uniquely to the literature on how a school-wide educational initiative is associated with teachers' perceptions of their school environment as well as their collaborative behaviors and beliefs.

No dream denied describes the primary obstacle to student achievement as being teacher attrition (NCTAF, 2003). NCTAF maintains that schools must be occupied with creating satisfying work environments for teachers, and as such, a central goal of schools must be the development of a collegial work environment in schools where teachers are able to grow professionally through collaborating with colleagues. Results of the current study identify RC implementation as a potential mechanism to increase teacher collaboration.

Two themes emerged from the interviews with administrators that raise questions for further research. First, how is the quantity and quality of teacher collaboration affected by the personalities of individual teachers? Two PIPs commented that teachers' personalities played a critical role in teacher collaboration, and this is an area of research that is not well represented in current literature. Second, what effect do principals' definitions of teacher collaboration have on the quantity and quality of teachers' collaborative interactions? For example, one principal defined teacher collaboration solely in terms of school decision-making while another principal

defined collaboration as having both an academic and 'socializing' component. Empirical literature from the fields of social and organizational psychology would be useful in examining these complex social problems.

The gestalt philosophy of 'the sum is greater than its parts' holds intuitive appeal when thinking about the merits of teacher collaboration, as evidenced by a comparison school principal who stated, 'And teacher collaboration, teachers working together, getting that spirit and spark going to the school really can transform the school'. Yet, when considering the value of enhancing teacher collaboration versus strengthening other aspects of teachers' professional development, the choice is unclear. The current study is a step toward a better understanding of the construct of teacher collaboration and the factors influencing collaboration.

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