

Abstract Title Page
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Title:

Students' Perceptions of Social Relatedness in the Classroom: The Roles of Student-Teacher Interaction Quality, Children's Aggressive Behaviors, and Peer Rejection

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Abstract Body

Background / Context:

The proposed re-authorization of the Elementary and Secondary Education act expressly recognizes the importance of effective teachers, and mandates that schools provide support for their teachers' professional development (U.S. Department of Education ORPE, 2010). The challenge to researchers, then, is to determine how teachers can promote students' academic motivation, engagement and, ultimately, achievement. Research suggests that the quality of teacher-student and student-student relationships in the classroom predicts children's academic engagement (Furrer & Skinner, 2003). Therefore, a central task is to identify determinants of high-quality social relationships (O'Connor, 2010). Based on research demonstrating the importance of student-teacher interactions in children's academic and social development (Hamre & Pianta, 2005), we propose that such interactions may affect students' development by promoting close relationships in the classroom (e.g., O'Connor, 2010).

Theoretical support for the importance of relationships comes from theories of self-system processes (Connell & Wellborn, 1991) and self-determination theory (Deci, Vallerand, Pettetier, & Ryan, 1991), both of which recognize *relatedness* as essential to optimal human functioning. In classrooms, children are affected by relationships with teachers as well as with fellow classmates (Goodenow, 1993).

Supportive relationships with teachers may provide a "secure base" (Ainsworth, Blehar, Waters, & Wall, 1978) that allows children to explore and take risks in their learning, developing social and cognitive skills (Brock, Nishida, Chiong, Grimm, & Rimm-Kaufman, 2008). Indeed, research finds that supportive teacher relationships, characterized by warmth and open communication (Pianta, 1992), are associated with greater academic engagement (Hughes, Luo, Kowk, & Loyd, 2008), performance (McCartney, 2007), social competence (Pianta & Stuhlman, 2004), as well as fewer aggressive and internalizing behaviors (Howes, 2000). Relationships with teachers during the elementary grades are, on average, quite positive, especially for girls (Gest, Welsh, & Domitrovich, 2005), but quality may decline across grades (O'Connor, 2010).

The importance of supportive relationships with classmates has been addressed from an ecological perspective (e.g., Battistich & Hom, 1997). Students' sense of the classroom as a caring community is associated with positive academic behaviors, including increased intrinsic motivation and liking for school (Battistich, Solomon, Kim, Watson, & Schaps, 1995), as well as better social skills and less externalizing behavior problems (Demaray & Malecki, 2002). As with teacher support, girls and younger children typically report higher levels of classroom support (Gest et al., 2005). The broader indicator of loneliness refers to children's feelings of dissatisfaction with their social relationships, which are often the result of a lack of friends or low social status in the classroom (Asher, Hymel, & Renshaw, 1984). Approximately 10% of elementary-aged children report feeling lonely, although children likely underreport due to social desirability (Asher et al.).

Significant between-classroom differences in students' perceptions of support suggest that classroom-level factors (e.g., the teacher) may affect relationship quality over and above the effect of child characteristics (Danielson, Wiium, Wilhelmsen, & Bente Wold, 2010). Furthermore, a large-scale study in which teachers were randomly assigned to classrooms revealed that *teaching effectiveness*, as measured by students' gains in mathematics and reading scores, varied significantly at the classroom level, with much less between-school variance. It seems that teacher assignment may be more important in determining students' academic outcomes than school placement (Nye, Konstantopoulos, & Hedges, 2004).

The Classroom Assessment Scoring System (CLASS) observational framework (Pianta, La Paro, & Hamre, 2008) is one attempt to conceptualize and measure potentially important differences between classrooms. A defining feature of the CLASS is the view that the most important aspect of classroom quality is not what is taught (i.e., the chosen curriculum), but *how* it is taught, in terms of emotional support, instructional support, and management of the classroom. Emotionally supportive interactions have been associated with students' reading and math development (Pianta, Belsky, Vandergrift, Houts, Morrison, & NICHD-ECCRN, 2008) as well as social competence (Mashburn, Pianta, Hamre, Downer, Barbarin, Bryant, et al., 2008). Similarly, high instructional support predicts better academic outcomes (Mashburn et al.), and classroom organization has been associated with increased literacy in first-grade children (Ponitz, Rimm-Kaufmann, Brock, & Nathanson, 2009). Of particular relevance to the current study are findings that children in classrooms with high-quality interactions have better relationships with their teachers, as indicated by teacher reports (O'Connor, 2010). Furthermore, teachers who were observed to be patient and encouraging had students who reported a higher sense of community within the classroom (Solomon, Battistich, Kim, & Watson, 1997).

The resiliency literature suggests that high-quality relationships may be especially important for at-risk children (Masten & Coatsworth, 1998). Indeed, aggressive children with close teacher relationships have fewer later behavior problems (Hamre & Pianta, 2001) and like school more (Gest et al., 2005). Unfortunately, children who are aggressive or rejected by their peers often have poor-quality relationships (Asher, Parkurst, Hymel, & Williams, 1990; Gest et al.). Research suggests that supportive interactions may be especially important for these children (Hamre & Pianta, 2005).

Purpose / Objective / Research Question / Focus of Study:

This study contributes to the literature clarifying teaching practices in elementary classrooms that promote students' social relatedness. The focus on teaching practices reflects the need to understand malleable elements of the classroom, which can then be targeted for professional development. Specifically, this study examines whether children in classes characterized by high-quality student-teacher interactions, as measured at the global (i.e., whole classroom) level, perceive more supportive relationships with both their teacher and fellow classmates.

Our research questions are as follows:

- (1) **What is the association between supportive teacher interactions and students' perceptions of relatedness?** We expected that emotionally and instructionally supportive interactions, as well as well-organized classroom environments, would be associated with students' perceptions of supportive relationships with their teachers and classmates, as well as lower levels of loneliness.
- (2) **Are aggressive and rejected children at greater risk than their peers of perceiving poor-quality classroom relationships?** We expected that both child characteristics would be associated with less perceived teacher support and classroom support, and higher levels of loneliness.
- (3) **Do high-quality student-teacher interactions protect aggressive and rejected children from experiencing poor relationships?** We expected that interaction quality would moderate the association between these child characteristics and perceptions of relationship quality in the classroom.
- (4) **Does the quality of student-teacher interactions at the beginning of the academic year predict changes in students' perceptions of relatedness over the course of the**

year? We expected that students in classrooms high in emotional support, instructional support, and classroom organization in the fall would have increases in their perceptions of loneliness.

Setting:

The study included children and teachers from small- to mid-sized urban areas in central Illinois and rural areas in central Pennsylvania. In Illinois, we collected data from two school districts that serve populations of 70,000 and 35,000. In both districts, approximately 44% of students were classified as disadvantaged. The districts were quite diverse (approximately 43% African-American, 8% Asian, 3% Hispanic). In Pennsylvania, data were collected from one school district that serves a population of 12,882, with 35% of students classified as economically disadvantaged. Students in this district were racially homogenous (>97% European-American).

Population / Participants / Subjects:

In the pilot year of the study (Year 1; 2008-2009), forty-one classrooms participated, providing a total of 794 students in 1st, 3rd, and 5th grade. Written consent was obtained from the 41 classroom teachers; and parental consent was obtained for 645 students. Written (3rd – and 5th – graders) or oral (1st–graders) assent was obtained from children before administering surveys. After accounting for dissenting and absent students, a total of 635 students (80% of all possible students) participated in the first or second administration of the survey (T₁= 76%, T₂= 76%). Because one classroom had extremely low participation (N = 6), its students were excluded from analysis. One child did not respond to the measures used in the present study. Therefore, the final sample for the pilot year was 40 classrooms and 628 children (52% male). In the subsequent school year (Year 2; 2009-2010), a similar number of teachers and students in 1st–, 3rd–, and 5th– grade classrooms were recruited from the same schools.

Intervention / Program / Practice:

This study examined the typical teaching practices of elementary school teachers; as such, teachers did not follow a defined program for the purpose of the study. Specifically, the practices under investigation were those outlined in the CLASS framework (Pianta, La Paro, & Hamre, 2008). The CLASS framework divides classroom quality into ten dimensions of specific interactions, which cluster in three domains: **Emotional Support**, which measures the extent to which teachers “support social and emotional functioning in the classroom” (p. 3; a composite of Positive Climate, Negative Climate, Regard for Student Perspective, and Teacher Sensitivity); **Classroom Organization**, which measures teachers’ organization of instructional time and transitions, and effective use of discipline (Behavior Management, Productivity, and Instructional Learning Formats), and **Instructional Support**, which measures teachers’ facilitation of students’ learning using any curriculum (Concept Development, Quality of Feedback, and Language Modeling). These ten dimensions were derived from examinations of other observational measures, the literature on effective teaching practices, focus group interviews, and pilot tests (Pianta et al.).

Research Design:

The current project is a non-experimental, correlational study. The completed analyses presented below were based on the pilot year of the study, which included two closely spaced assessments

that are combined and treated as a cross-sectional design. In Year 2, the study had a within-year longitudinal design.

Data Collection and Analysis: In the pilot year for which analyses are presented below, classrooms were observed early in the spring semester, and students completed surveys twice: once early in the spring semester, and again at the end of the semester. In the second year, data were collected three times: in the first 6-8 weeks of school, approximately 8 weeks later, and within 6-8 weeks of the end of the school year. Descriptive statistics are provided in Table 1.

(please insert Table 1 here)

Teaching practices were evaluated with the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008). Two observers rated each classroom for four 20-minute cycles, typically at the beginning of the day. Inter-rater reliability was high, as indicated by the intraclass correlations: Emotional Support (Intraclass Correlation = .71), Instructional Support (ICC = .88) and Classroom Organization (ICC = .84). Scores were averaged across observers. This dual-observer system was designed to maximize the reliability of the scores used in analyses, based on research indicating that rater-variance was a critical source of measurement error for the CLASS procedure (Raudenbush, Martinez, Bloom, Zhu, & Lin, 2007).

Social relatedness was measured with three child-report scales obtained during group-administered surveys (3rd and 5th grade) or individual interviews (1st grade). *Teacher supportiveness* was conceptualized as the degree to which students perceived a warm, caring relationship with their teacher. It was measured using seven items adapted for student-report from the Closeness subscale of the Student-Teacher Relationship Scale ($\alpha_{t1} = .84$, $\alpha_{t2} = .89$, $r_{1,2} = .69$; e.g., “My teacher is kind to me”; Pianta, 1992). *Classroom supportiveness* was conceptualized as the degree to which students perceived the classroom as a supportive and caring environment. It was measured using seven items from the Sense of Community scale ($\alpha_{t1} = .83$, $\alpha_{t2} = .82$, $r_{1,2} = .63$; e.g., “People care about each other in my classroom”; Battistich et al., 1995). *Loneliness* was measured with three items that correlate strongly with a longer scale measuring social disaffection ($\alpha_{t1} = .87$, $\alpha_{t2} = .85$, $r_{1,2} = .55$; Parker & Asher, 2003). The strong negative skew in Teacher Supportiveness was reduced by taking $\exp(x)$ prior to analysis. Scores on Loneliness were positively skewed; for analysis, loneliness was dichotomized to distinguish children reporting substantial loneliness (≥ 3 on the 5-point scale; 24% of sample) from those reporting relatively little loneliness. All measures were averaged across the two surveys.

Child characteristics were assessed with peer nomination-based measures, based upon unlimited nominations; results for each measure were standardized within the classroom by dividing each child’s number of received nominations by the total number of children providing nominations. For the measure of *peer social preference*, children indicated which of their classmates they would “like most to play with” and “like least to play with.” Social preference was calculated as “like most” – “like least” ($r_{1,2} = .72$). *Aggression* was measured with three peer-nomination items; (e.g., “These kids start fights”; $\alpha_{t1} = .90$, $\alpha_{t2} = .89$, $r_{1,2} = .87$). Because scores on both social preference and aggression were highly correlated between waves, the average of the across-wave scores was used for analyses.

Hypotheses were tested with two-level multilevel models, with children nested within classrooms. Each model controlled for gender, grade level, class size and the fixed effects of school, and tested the main effects of aggression, social preference, and a single CLASS domain (e.g., Emotional Support). Separate models were analyzed to test the association of each CLASS domain with each indicator of social relatedness. Moderation effects were tested by including a variable equal to the product of the relevant CLASS measure and the child characteristic.

Insignificant interaction terms were removed from the model for parsimony. The planned longitudinal analyses from Year 2 will be tested using three-level multilevel models, with time nested within children, who are nested within classrooms. These analyses will reveal whether supportive student-teacher interactions lead to increases in children's perceptions of relationship quality across the year.

Findings / Results:

There was significant variance between classrooms for all indicators of relatedness, suggesting that classrooms differed in their provision of support for student relatedness. Perceptions of teacher supportiveness were higher among girls ($p < .001$) and younger students ($p < .01$). Younger students also perceived more support from classmates than did older students ($p < .001$). After taking these effects into account, aggression predicted less perceived teacher support ($p < .001$), and high social preference was associated with lower levels of loneliness ($p < .001$). Observations of emotional support and instructional support were associated with higher perceptions of teacher supportiveness (p 's $< .01$) and classroom supportiveness (p 's $< .01$). Classroom organization also predicted teacher and classroom supportiveness ($p < .05$). Levels of emotional support interacted with aggressive behavior in the prediction of loneliness. Non-aggressive children reported less loneliness in classrooms with high emotional support, whereas aggressive children had higher levels of loneliness in emotionally supportive classrooms ($p < .05$). Results for the models predicting Teacher Support are in Table 2. Results from planned analyses of Year 2 data will reveal whether emotional support, instructional support, and classroom organization at the beginning of the year predict changes in students' levels of relatedness.

(Please insert table 2 here)

Conclusions:

Although students generally reported supportive relationships with teachers and classmates, relationship quality varied from classroom to classroom. We have shown that observed levels of emotional and instructional support, and, to a lesser extent, classroom organization, are associated with students' perceptions of supportive social relationships within the classrooms. Furthermore, children who are rated by their peers as aggressive may struggle to form close relationships with their teachers. Similarly, children who are less socially preferred are more likely to report feelings of loneliness. Finally, we found that aggressive children in emotionally supportive classrooms had higher levels of loneliness than aggressive children in classrooms with poor emotional support. It may be that teachers who create emotionally supportive classroom climates establish norms against aggression, resulting in the marginalization of aggressive children.

These analyses are limited by their concurrent nature, which precludes inferences about the direction of influence. Our understanding of the importance of student-teacher interactions will benefit greatly from the longitudinal analyses, which will be presented in the final poster. If perceptions of relational support are linked with subsequent engagement and achievement as suggested by Connell and Wellborn (1991) and Furrer and Skinner (2003), our findings would suggest an important process by which emotional and instructional support may foster student achievement.

Appendices

Appendix A. References

- Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, N.J.: Erlbaum.
- Asher, S. R., Hymel, S., & Renshaw, P. D. (1984). Loneliness in children. *Child Development*, 55, 1456-1464.
- Asher, S. R., Parkhurst, J. T., Hymel, S., & Williams, G. A. (1990). Peer rejection and loneliness in childhood. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 253—273). Cambridge, UK: Cambridge University Press.
- Battistich, V. & Hom, A. (1997). The relationship between students' sense of their schools as a community and their involvement in problem behaviors. *American Journal of Public Health*, 87(12), 1997 – 2001.
- Battistich, V., Solomon, D., Kim, D., Watson, M., & Schaps, E. (1995). Schools as communities, poverty levels of student populations, and students' attitudes, motives, and performance: A multilevel analysis. *American Educational Research Journal*, 32(3), 627-658.
- Baumeister, R. F., & Leary, M. R., The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497 – 529.
- Brock, L. L., Nishida, T. K., Chiong, C., Grimm, K. J., & Rimm-Kaufman, S. E. (2008). Children's perceptions of the classroom environment and social and academic performance: A longitudinal analysis of the contribution of the responsive classroom approach. *Journal of School Psychology*, 46, 129-149.
- Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy and relatedness: A motivational analysis of self-system processes. In M. R. Gunnar, & L. A. Sroufe (Eds.), *Self processes and development: The Minnesota Symposia on Child Development*, vol. 23 (pp. 43–78). Hillsdale, NJ: Erlbaum
- Danielson, A. G., Wium, N., Wilhelmsen, B. U., & Wold, B. (2010). Perceived support provided by teachers and classmates and students' self-reported academic initiative. *Journal of School Psychology*, 48, 247-267.
- Deci, E. L., Vallerland, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist*, 26, 325-346.
- Demaray, M. K., Malecki, C. K. (2002). Critical levels of perceived social support associated with student adjustment. *School Psychology Quarterly*, 17(3), 213-241.
- Gest, S. D., Welsh, J. A., & Domitrovich, C. E. (2005). Behavioral predictors of changes in social relatedness and liking school in elementary school. *Journal of School Psychology*, 43, 281-301.
- Goodenow, C. 1993. Classroom belonging among early adolescent students: Relationships to motivation and achievement. *The Journal of Early Adolescence*, 13(1), 21-43.
- Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology*, 95(1), 148-162.
- Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72(2), 625-638.
- Hamre, B. K., & Pianta, R. C. (2005). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development*, 76(5), 949 – 967.

- Howes, C. (2000). Social-emotional classroom climate in child care, child-teacher relationships and children's second-grade peer relations. *Social Development, 9*(2), 191-204.
- Hughes, J., Luo, W., Kwok, O., & Loyd, L. K. (2008). Teacher-student support, effortful engagement, and achievement- A 3-year longitudinal study. *Journal of Educational Psychology, 100*(1), 1-14. DOI: 10.1037/0022-0663.100.1.1
- Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development, 70*(6), 1373-1400.
- Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D. et al., 2008. Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development, 79*(3), 732-749. DOI: 10.1111/j.1467-8624.2008.01154.x
- Masten, A. S. & Coatsworth, J. D. (1998) The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American Psychologist, 53*, 205-220.
- Nye, B., Konstantopoulos, S., & Hedges, L. V. (2004). How large are teacher effects? *Educational Evaluation and Policy Analysis, 26*, 237-257.
- O'Connor, E. (2010). Teacher-child relationships as dynamic systems. *Journal of School Psychology, 48*, 187-218.
- O'Connor, E., & McCartney, K. (2007). Examining teacher-student relationships and achievement as part of an ecological model of development. *American Educational Research Journal, 44*(2), 340-369.
- Parker, J. G., & Asher, S. R. (1993). Friendship and friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology, 29*(4), 611-621.
- Pianta, R. C. (1992). *The Student-Teacher Relationship Scale*. University of Virginia.
- Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington, DC: American Psychological Association.
- Pianta, R. C., Belsky, J., Vandergrift, N., Houts, R., Morrison, F. & The National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network (2008). Classroom effects on children's achievement trajectories in elementary school. *American Education Research Journal, 49*, 365-397.
- Pianta, R. C., La Paro, K. M., & Hamre, B. K. (2008). *The Classroom Assessment Scoring System (CLASS)*. Brookes Publishing.
- Pianta, R. C., & Stuhlman, M. W. (2004). Teacher-child relationships and children's success in the first years of school. *School Psychology Review, 33*(3), 444-458.
- Ponitz, C. C., Rimm-Kaufmann, S., Brock, L., & Nathanson, L. (2009). Early adjustment, gender differences, and classroom organizational climate in first grade. *Elementary School Journal, 110*(2), 142-162.
- U.S. Department of Education, Office of Planning, Evaluation and Policy Development (2010). *ESEA Blueprint for Reform*. Washington, DC. Retrieved October 1, 2010 from <http://www2.ed.gov/policy/elsec/leg/blueprint/blueprint.pdf>
- Raudenbush, S. W., Martinez, A., Bloom, H., Zhu, P., & Lin, F. (2007). The reliability of group-level measures and the power of group-randomized studies. Working Paper, University of Chicago, University of Michigan, MDRC.
- Sanders, William, and June Rivers (1996). *Cumulative and residual effects of teachers on future*

student academic achievement. Knoxville: University of Tennessee Value-Added Research and Assessment Center.

Solomon, D., Battistich, V., Kim, D., & Watson, M. (1997). Teacher practices associated with students' sense of the classroom as a community. *Social Psychology of Education, 1*, 235-267.

Appendix B. Tables and Figures

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Table 1

Descriptive Statistics for Measures of Classroom Quality and Relational Support (Year 1)

	N	M	SD	Min	Max
Peer-Nominated Child Characteristics*					
Aggressive Behavior	628	0.18	0.19	0	0.93
Peer Preference	628	0.03	0.29	-1	0.77
Observed Classroom Quality					
Emotional Support	40	5.34	.51	4.38	6.50
Instructional Support	40	3.81	.81	1.71	5.71
Classroom Organization	40	5.12	.55	3.71	6.04
Youth Reports of Relational Support					
Teacher Supportiveness	628	4.27	.78	1	5
Classroom Supportiveness	628	3.66	0.86	1	5
Loneliness	628	2.08	1.07	1	5

Table 2

Multi-level models predicting youth reports of relational support from observed classroom quality

	Youth Reports of Relational Support					
	Teacher Support		Classroom Support		Loneliness	
Class Size	-0.93	(0.92)	-0.02	(0.02)	0.01	(0.01)
Grade	-3.52**	(1.03)	-0.14***	(0.02)	-0.02	(0.01)
Gender	13.09***	(3.35)	-0.02	(0.07)	0.01	(0.03)
Peer Preference	-3.17	(6.55)	0.14	(0.13)	-0.30***	(0.07)
Aggression	-50.77***	(10.27)	0.16	(0.20)	-0.12	(0.11)
Emotional Support (ES)	15.82**	(5.46)	0.24*	(0.09)	-0.08	(.05)
Aggression * ES	0.47**	(0.16)				

Note. Models control for nesting within classrooms ($n = 40$) and fixed effects of school ($n = 7$). Class size, peer preference, aggression, and emotional support scores were centered at the grand mean. Parallel models were tested for the CLASS dimensions of Instructional Support and Classroom Organization.

* $p < .05$, ** $p < .01$, *** $p < .001$