Abstract Title Page

Title: The Direct and Moderating Role of School Interpersonal Climate on Children's Academic Outcomes in the Context of Whole-School, Social-Emotional Learning Programs

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Abstract Body

Background / Context:

A positive school climate is characterized by a supportive, orderly, and fair interpersonal climate (Anderson, 1982; Cohen, McCabe, Michelli, & Pickeral, 2009; Haynes, Emmons, & Ben-Avie, 1997). Children's perceptions of interpersonal climate and school safety are associated with a several academic and behavioral adjustment outcomes (Brookmeyer et al., 2006; Bond et al., 2007; Fisher & Fraser, 1991; Kuperminc, Leadbeater, & Blatt, 2001; Loukas & Murphy, 2007). Moreover, a lack of teacher support and affiliation has been linked to teacher burnout, lower professional commitment, and lower self-efficacy in eliciting help (Brouwers et al., 2001; Dorman, 2003; Osterman, 2000; Maslach, 1999), all of which have important consequences for children's opportunities to succeed. Most empirical studies have looked at only one or two dimensions of school climate, only at one level, or from only one reporter, failing to empirically capture what theory would suggest is a multidimensional, multilevel, and systemic construct The question of how cross-dimension and cross-level interactions (e.g., contextual features of classrooms and children's feelings of safety) contribute to children's school adjustment remains. Furthermore, with a few exceptions (e.g., Bradshaw, Koth, Thornton, & Leaf, 2009), many whole-school interventions seeking to achieve systemic change do not quantitatively measure whether they were successful at doing so (Durlak et al., 2007). Similarly, while a positive school climate can aid in the implementation of whole-school interventions (Bradshaw et al., 2009; Durlak & DuPre, 2008), little research has sought to understand whether school climate moderates the impacts of the intervention on student outcomes.

Purpose / Objective / Research Question / Focus of Study:

The current study has two goals: (1) to better understand the contribution of school interpersonal climate to children's school success; (2) to examine whether the impact of the whole-school implementation of social and character development (SACD) programs are moderated by interpersonal climate. The study asks: (1) Is there a direct relationship between school interpersonal climate at the start of 3rd grade as perceived by children and teachers and modeled at the individual and school levels and children's school engagement and academic competence/motivation at the end of 5th grade? (2) Do school-aggregated child and teacher perceptions of interpersonal climate moderate the relationship between children's individual perceptions of climate and the outcomes? (3) Is there an impact of SACD programs on engagement and academic competence? (4) Do school-aggregated child and teacher perceptions of interpersonal climate moderate the impact of SACD programs on school engagement and academic competence? (See Figure 1 for a conceptual model.)

Setting:

Data come from a three-year, multi-site, school-randomized evaluation of Social and Character Development (SACD) Programs in 83 elementary schools in 7 sites and 6 states funded by the Institute of Education Sciences and Centers for Disease Control (see IES NCER report on SACD Programs, http://ies.ed.gov/ncer/pubs/20112001/).

Population / Participants / Subjects:

The student sample consisted of 6,567 children who were in the third-grade at the start of the evaluation. Children who entered the study schools over the course of the three years of the evaluation were added to the sample, and leavers were not tracked after they left a study school.

In spring of 2007, the child sample consisted of 6,249 children (69% of the original sample). For the purposes of this study, only students who were in the study at baseline were included in the sample. The current child sample therefore consisted of 4,245 children in 320 classrooms at baseline. Just over half (52%) of the children were girls. Children were ethnically diverse (43% White, 30% Black/African American, 19% Hispanic/Latino, 7% other). The average age was 8.5 (SD = .47). About 43% of households had incomes at or lower than 135% of the federal poverty level. The teacher sample consisted of third, fourth, and fifth grade teachers in the participating schools (N = 841 at baseline; 89% female). The majority of teachers (73%) self-reported as non-Hispanic White, 17% as Black or African-American, 6% as Hispanic, and the remaining teachers as other (i.e., Asian, American-Indian, or Alaskan Native). Teachers averaged 10 years of teaching experience overall (SD=9) and 5 years at their current school (SD=6).

Intervention / Program / Practice:

The Institute of Education Sciences (IES) and the Division of Violence Prevention in the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC) collaborated to conduct a rigorous impact evaluation of universal, school-based programs aimed at improving elementary school students' school adjustment (Social and Character Development Research Consortium, 2010). The seven programs evaluated were termed Social and Character Development (SACD) programs. Each of the programs sought to foster the development of social competencies, reduce negative behaviors, and improve academic performance. Each of the programs used a universal approach, implementing the programs in all elementary school classrooms. The programs employed activities to promote six SACD goals (character education, violence prevention and peace promotion, social and emotional development, tolerance and diversity, risk prevention and health promotion, and civic responsibility and community service) as well as behavior management. The seven programs were: Academic and Behavioral Competencies, Competence Support, Love in a Big World, Positive Action, Promoting Alternative Thinking Strategies, 4Rs, and Second Step.

Research Design:

In each site, a research team randomized 10 to 18 schools to the business-as-usual approach to implement the SACD program (Social and Character Development Research Consortium, 2010). A total of 84 schools were recruited into the study. The randomization employed a matched pair design with stratified sampling. Each site created five to seven pairs of schools. Pairs were created by minimizing the distance between several measurable characteristics for schools within each pair. The school characteristics used to create the pairs differed across sites, depending on what data were available. One school within each pair was randomly assigned to the treatment group and the other was assigned to the control group. Although the intervention was implemented school-wide, the evaluation consisted of one cohort of students who was followed over 3 years from 3rd to 5th grade. As part of the evaluation, a common set of student outcomes including social and emotional competence, behavior, academics, and perceptions of school climate were collected across sites.

Data Collection and Analysis:

The first wave of data was collected on consenting students in the third grade during fall of 2004. Follow-up data were collected in spring of Year 1 (2005), fall and spring of Year 2 (2005-2006), and spring of Year 3 (2007) when the students were in fifth grade. Data included

survey data from students, primary caregivers, teachers, and interview responses from principals. In addition, each site collected its own set of site-specific data.

Three-level hierarchical linear modeling (HLM 6.02, Raudenbush & Bryk, 2002) with fixed effects in which children were nested in teachers and schools was used to account for the multilevel nature of our data. Because students changed classrooms across the three years of the study, no hypotheses were made about relationships between classroom-level (Level 2) predictors and the outcomes. Modeling this level allowed us to include teacher demographic controls and teachers' individual perceptions of climate (also entered as school aggregates at Level 3) at the appropriate level and to control for variation in individual teacher reports of interpersonal climate. All predictor variables were measured in fall of Year 1, at baseline, and outcomes were measured in spring of Year 3, at the end of the study. All models controlled for baseline levels of the outcomes. The following measures were included.

Child-level school interpersonal climate. Children were asked to report on the interpersonal climate of their school (1 = disagree a lot to 4 = agree a lot). *Negative interpersonal climate* included 4 negatively worded items from the Sense of School as Community measure (Roberts, Horn, & Battistich, 1995). *Feeling Afraid* (IES/CDC developed) included 4 items about how afraid children are that they or other students will be bullied, hurt, or teased.

Teacher-level interpersonal climate. Three dimensions of teachers' reports of the organizational and interpersonal environment of their schools -- teacher affiliation, student respect, and school safety -- were used (SLEQ; Fisher & Fraser, 1991). The three dimensions included 19 items on a 5-point rating scale (1=strongly disagree to 5=strongly agree).

School-level interpersonal climate. The two child-level dimensions and one additional child-reported dimension, peer aggression (Orpinas & Frankowski, 2001), were aggregated to the school level and combined to form one factor based on multilevel factor analysis, representing children's reports of school negative interpersonal climate. Three dimensions of teachers' individual perceptions of interpersonal climate were aggregated to the school level. Based on multilevel factor analysis, student respect and school safety were combined to form one factor.

Outcome measures. Children rated their level of *behavioral engagement* (Furrer & Skinner, 2003). *Academic competence/motivation* (IES/CDC developed; adapted from Gresham & Elliott, 1990 and Achenbach, 1991) was assessed with 4 items asking teachers to report on their students' performance in math and reading and overall and their motivation to succeed.

Child-level covariates. Child-level covariates included parent reports of their children's gender, race/ethnicity, and household income (1=below 135% of poverty level). Teacher-level covariates included teacher-reported race/ethnicity, gender, and years of experience. School-level covariates included treatment status, 6 site dummies, and the proportion of minority students and poor students in school. These were computed from parent-reported race/ethnicity and income using sample students, and were treated as proxies for school composition.

Findings / Results:

Results without (Model 1) and with interactions (Model 2) are shown in Table 1.

Child level. Children's individual perceptions of negative interpersonal climate were significantly related to engagement ($\beta = -.04$, $p < .01$) and to academic competence/motivation ($\beta = -.06$, $p < .01$), but children's perceptions of feeling afraid were not, after controlling for fall levels of the outcome and the demographic covariates.

School level. Aggregated teachers' perceptions of teacher affiliation were significantly related to lower academic competence/motivation ($\beta = -.27$, $p < .01$) and marginally related to

lower engagement (β = .08, p < .10). Aggregated teacher perceptions of student respect/safety were significantly related to higher academic competence/motivation (β = .29, p < .01). Contrary to expectations, schools in which teachers reported more affiliation had students with lower academic competence/motivation. Aggregated child perceptions of negative interpersonal climate were not significantly related to either outcome.

Cross-level interactions. The moderating effect of school-level climate was examined by including cross-level interactions between Level 1 negative interpersonal climate and feeling afraid and each of the Level 3 dimensions of climate. A cross-level interaction between Level 3 aggregated child perceptions of negative interpersonal climate and children's individual perceptions was significant for engagement (β = .13, p < .05). The interaction indicated that the negative relationship between children's perceptions of negative climate and engagement was stronger in schools with a less negative climate (see Figure 2).

Impact of SACD and moderating role of interpersonal climate. Preliminary analyses suggest that, overall, SACD programs did not impact engagement or academic competence (see Model 1 for each outcome). There was significant moderation of children's aggregated perceptions of negative interpersonal climate (β = .26, p < .01) (see Model 2). Contrary to expectations, treatment schools with a more negative climate had students who were more engaged, compared to treatment schools with a less negative climate, but the opposite was true in control schools (see Figure 3).

Conclusions:

Children who experienced a lack of community were less engaged and had more difficulty academically, pointing to the importance of children's own experiences in their academic success. Although school-level relationships were weak, teachers' perceptions of support and safety in school were also related to academic outcomes, although the counterintuitive negative relationship between school-aggregated teacher affiliation and academic competence/motivation warrants further unpacking. As these were both teacher reports, perhaps schools with teachers reporting more teacher affiliation also had teachers rating children's academic competence more strictly. The one cross-level interaction pointed to the importance of considering the fit between the child and the school environment. Children who had a good fit (i.e., perceived a more negative climate in the context of a school with a more negative climate) actually reported being more engaged, compared to children who had poor fit (i.e., perceived a negative climate in the context of a less negative climate). This finding is consistent with person-environment fit theory (Bellmore, Witkow, Graham, & Juvonen, 2004) and suggests that individual perceptions and the school ecology should be considered simultaneously. Finally, SACD programs did not directly improve academic outcomes. The one moderating effect suggests that while SACD schools had lower engagement overall, being in a more negative climate initially actually helped boost the impact of SACD programs on children's engagement. In follow-up analyses we will explore the possibility that these treatment schools, with more room to improve, showed enhancements in the climate and, in turn, engagement.

Limitations of this study include low intraclass correlations and reliabilities at the school levels for the study outcomes, suggesting low power to detect group-level effects. Further, other aspects of school climate such as strong leadership and high organization may act as more powerful moderators. Nevertheless, one implication of the findings is that intervention efforts that target the school climate need to be attentive to children's individual experiences, context-level factors and to the negative effects of dissonance between children and the social context.

Appendices

Not included in page count.

Appendix A. References

References are to be in APA version 6 format.

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Appendix B. Tables and Figures

Not included in page count.

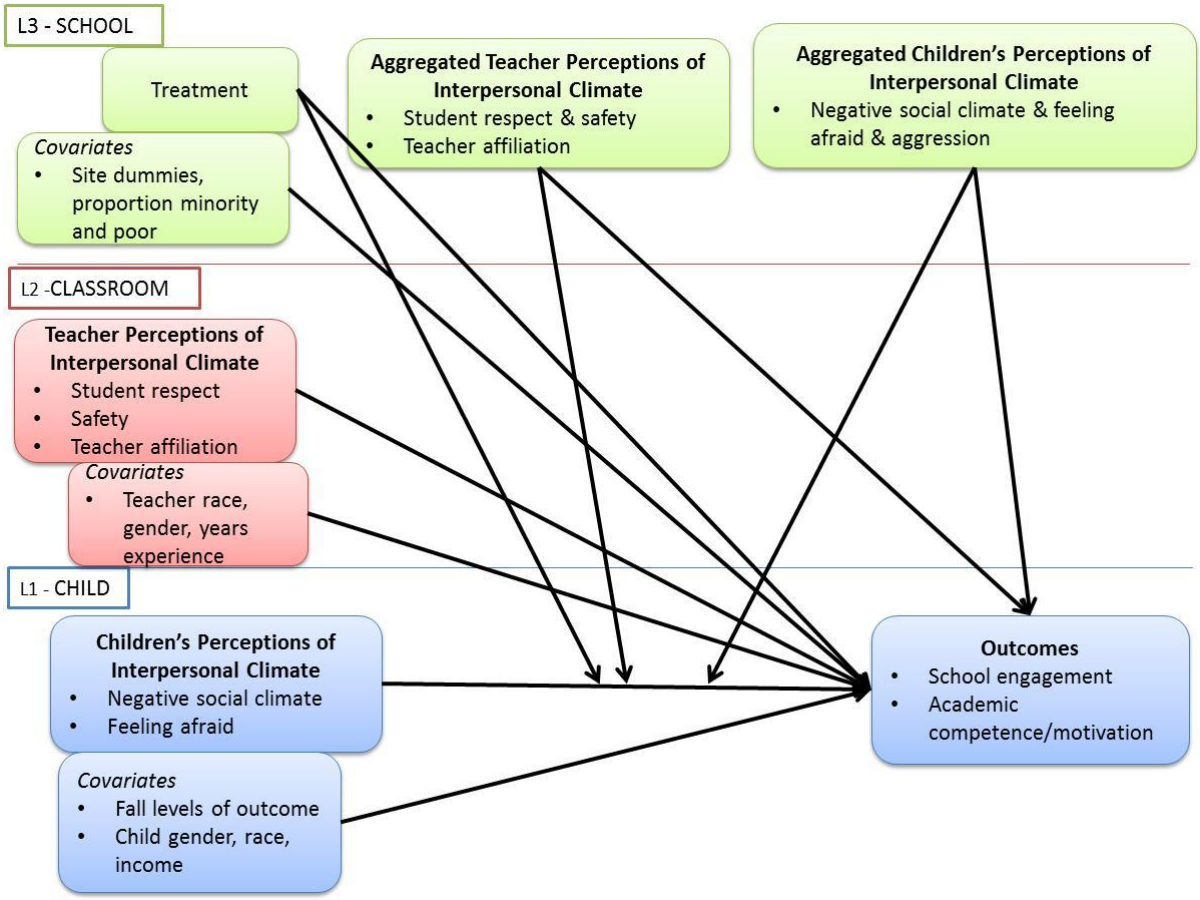

Figure 1. Conceptual model

Table 1. Hierarchical Linear Models Predicting Academic Competence and School Engagement

	Academic competence				School engagement			
	Model 1		Model 2		Model 1		Model 2	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Child (Level 1)								
Engagement/academic competence - baseline	0.72 ***	0.02	0.72 ***	0.02	0.13 ***	0.02	0.13 ***	0.02
Sex (1=girl)	0.09 **	0.03	0.09 **	0.03	0.18 ***	0.02	0.18 ***	0.02
Poor (1=below 135% poor)	-0.11 **	0.04	-0.11 **	0.04	-0.02	0.03	-0.03	0.03
Black	-0.11 *	0.05	-0.11 *	0.05	-0.05	0.04	-0.04	0.04
Hispanic	-0.07	0.05	-0.06	0.05	-0.08 †	0.04	-0.07	0.04
Other	-0.04	0.06	-0.04	0.06	0.03	0.04	0.03	0.04
Feeling afraid	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Negative interpersonal climate	-0.06 **	0.02	-0.06 **	0.02	-0.04 **	0.02	-0.05 **	0.02
Teacher/classroom (Level 2)								
Staff affiliation	0.04	0.04	0.04	0.04	0.00	0.02	0.00	0.02
Student respect	-0.10 **	0.04	-0.12 **	0.04	-0.01	0.02	-0.01	0.02
School safety	-0.04	0.03	-0.04	0.03	0.00	0.02	0.00	0.02
Sex (1=female)	0.08	0.09	0.08	0.09	0.07	0.05	0.06	0.05
Black	0.09	0.07	0.11	0.07	-0.01	0.03	-0.02	0.03
Hispanic	-0.02	0.11	-0.01	0.11	-0.03	0.06	-0.04	0.05
Other	0.32 **	0.12	0.32 *	0.12	0.02	0.08	0.02	0.08
Years of teaching experience	0.00	0.00	0.00	0.00	0.00 †	0.00	0.00 †	0.00
School (Level 3)								
Negative interpersonal climate	-0.28	0.20	-0.19	0.22	0.01	0.11	-0.11	0.13
Teacher affiliation	-0.27 **	0.08	-0.35 *	0.13	0.08 †	0.04	0.12	0.08
Student respect/safety	0.29 **	0.09	0.34 *	0.15	-0.07	0.05	-0.13	0.09
Treatment (1=treatment, 0=control)	-0.06	0.04	0.27	0.33	-0.02	0.02	-0.39 *	0.15
Percent poor	-0.10	0.18	-0.12	0.19	-0.27 *	0.11	-0.26 *	0.11
Percent minority	0.25	0.16	0.34 *	0.17	0.21 *	0.08	0.21 *	0.07
Tx X negative social climate			-0.25	0.25			0.26 *	0.12
Tx X student respect/safety			-0.02	0.17			0.08	0.10
Tx X teacher affiliation			0.11	0.15			-0.04	0.08
Cross-level interactions								
Negative interpersonal climate (L1xL3)							0.13 *	0.06
Random effects:								
Classroom-level variance	0.030 ***		0.030 ***		0.003 **		0.001 *	
School-level variance	0.011 ***		0.009 ***		0.000		0.001	
Negative interpersonal climate slope							0.003	
Residual variance	0.449		0.449		0.237		0.235	
Fit statistics:								
AIC	5363.95		5359.38		3505.65		3493.08	

Note. † p <.10. * p < .05. ** p < .01. ***p <.001.

Child N = 4,050; Classroom N = 305; School N = 84

Site dummies are included but not shown.

Unstandardized regression coefficients and robust standard errors are shown.

The following cross-level interactions were not significant and were taken out of the final models above: negative interpersonal climate by teacher affiliation and student/respect safety, feeling afraid by teacher affiliation, student/respect safety, negative interpersonal climate (L3).

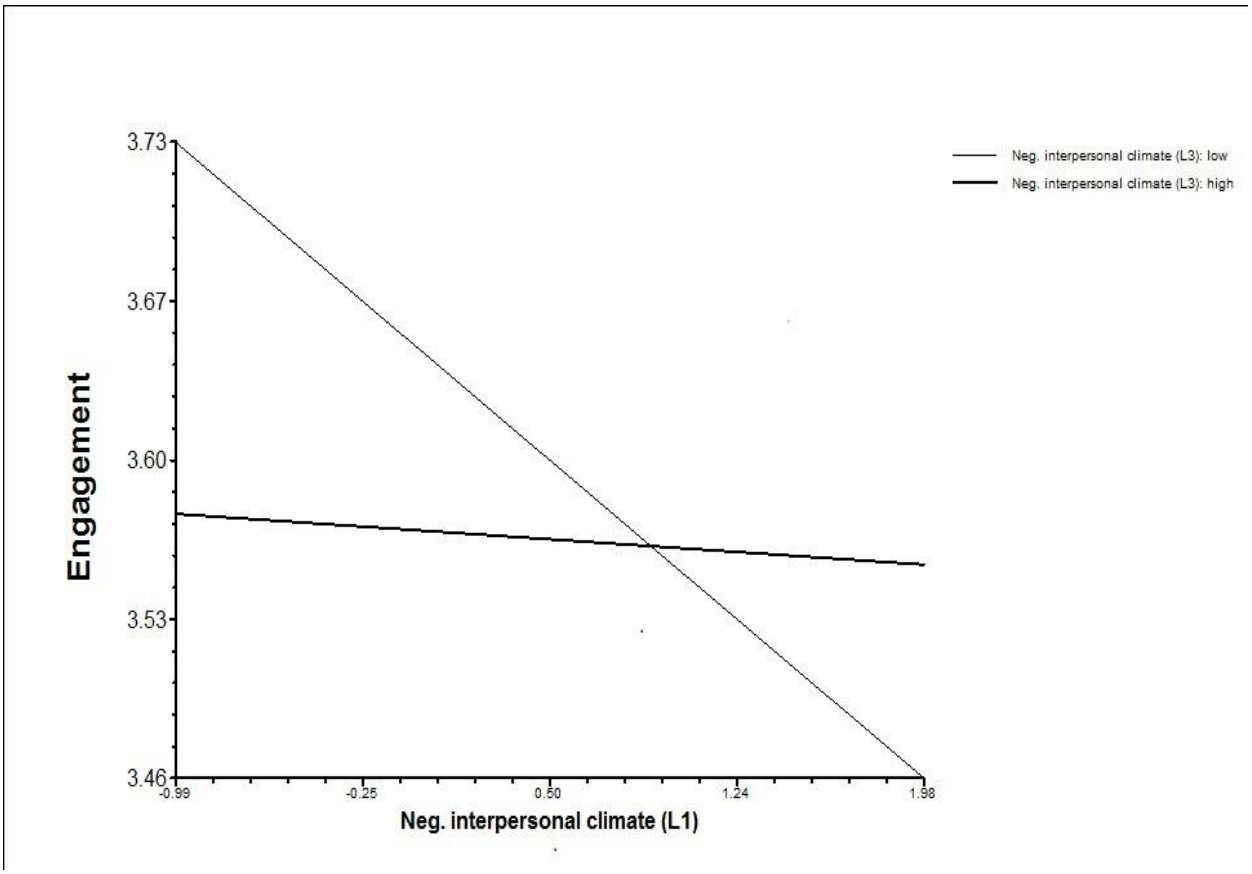

Figure 2. Interaction of individual perceptions of negative interpersonal climate (L1) by aggregated perceptions of negative interpersonal climate (L3) on school engagement. High interpersonal climate (L3) = upper quartile. Low interpersonal climate (L3) = lower quartile.

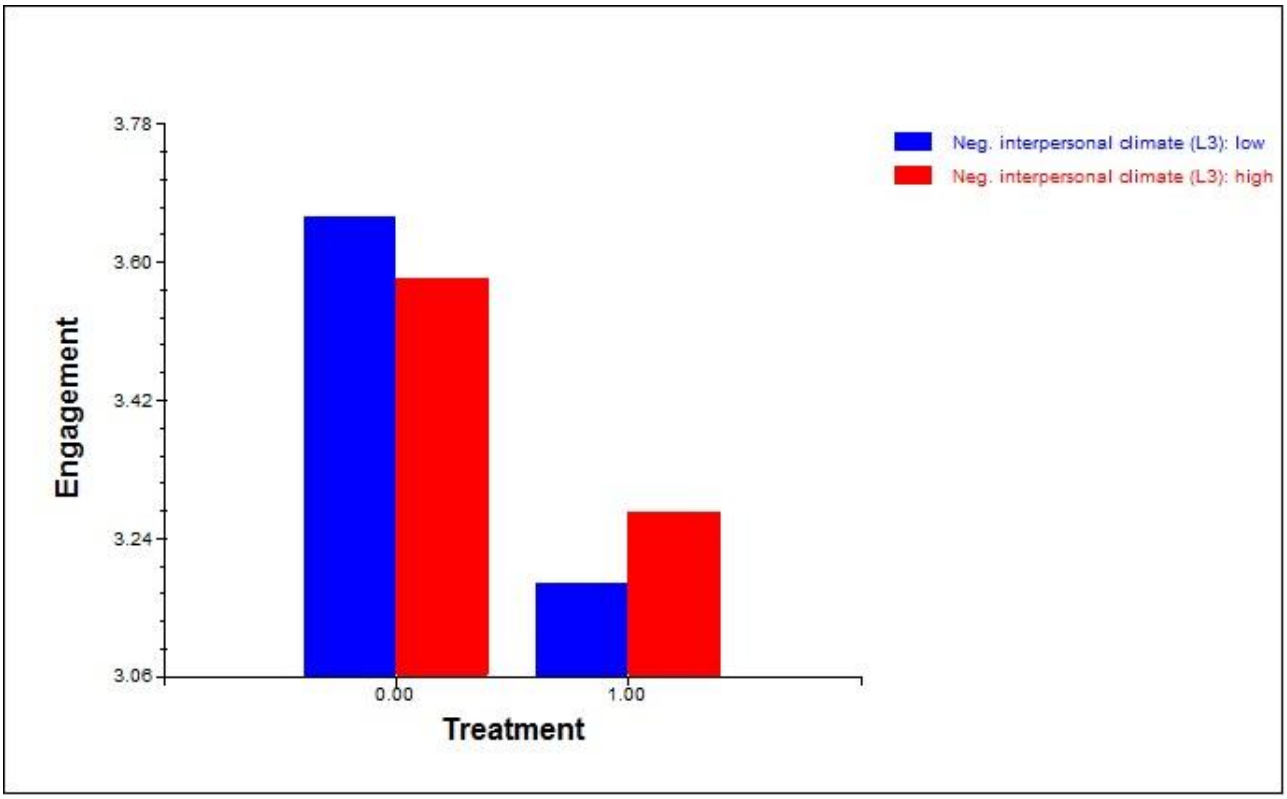

Figure 3. Interaction of treatment by aggregated perceptions of negative interpersonal climate (L3) on school engagement. High interpersonal climate (L3) = upper quartile. Low interpersonal climate (L3) = lower quartile.