

Abstract Title Page

Title: The school adjustment of students in distinct risk configurations: Considerations for the development of selected and indicated interventions

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Abstract Body

Background / Context:

As indicated in papers 2 and 3 of this symposium and in published research from Project REAL, there is clear evidence that the SEALS model has a general positive impact on the school context during the early adolescent years. This includes teachers' enhanced understanding of the peer group social structures formed by students, their management of classroom social dynamics, and their self-efficacy for meeting the instructional and social needs of students (Farmer, Hall, et al., 2010; Farmer, Hamm, et al., 2010; Hamm, Farmer, Dadisman et al., in press). Other positive effects include students' stronger belonging to and valuing of school, students' sustained positive perceptions of peer norms for academic effort, peer contexts and peer affiliations that are less supportive of bullying and aggression, and associated higher levels of academic achievement (Farmer, Hamm et al., 2010; Hamm, Farmer, Dadisman, et al., 2010).

However, as suggested by the findings in paper 3 of this symposium, these effects tend to be at the level of the general school and peer context and for youth with low to moderate levels of risk for school adjustment problems, as well as differentiated by gender. The limited impact of SEALS to the general context is expected because it was designed as a universal model that can serve as a Tier 1 base for selected (Tier 2) and indicated (Tier 3) intervention programs. To promote the development of intensive Tier 2 and Tier 3 interventions, there is a need to clarify factors and processes that are associated with improving or sustained positive patterns of academic adjustment in general, and in particular, for high-risk youth across early adolescence. This paper is an initial step in addressing this need.

Purpose / Objective / Research Question / Focus of Study:

The purpose of this study was to identify key process factors that support gains to academic outcomes in general, but specifically for students at-risk for school success. Such analyses will reveal mechanisms and / or student risk configurations that are not responsive to the universal intervention, and that should be considered as possible targets for further intervention. Thus, the focus of these analyses was not on the impact of the SEALS intervention but on differential patterns of adaptation of high-risk youth in relation to a variety of process variables that are possible mechanisms of change. Therefore, the analyses were conducted across the intervention and control samples with an emphasis on variables that distinguished high-risk youth who had positive academic outcomes from those who did not.

Setting:

Project REAL took place in public schools serving sixth graders; schools were configured as either middle (grades 6-8) or k8/k12 schools. Schools were located in the Appalachian, Deep South, Southwest, Pacific Northwest, Far West, Southeast, Northern Plains, and Midwest regions of the United States. Participating schools were located in low-wealth communities designated as rural by the National Center for Education Statistics (NCES).

Population / Participants / Subjects:

The current study included 28 Project REAL schools (14 matched pairs); 57% were middle schools. On average, the percentage of students eligible for free/reduced lunch was 61.52% ($SD = 28.91$). Schools ranged from 0% to 100% minority ($M = 33.80\%$, $SD = 38.99$). On

average 59% of students were at or above grade level for reading and math standardized test scores. Consent rate averaged 64.7% (SD = 13.69). School size ranged from 72-581 students. A total of 1587 students participated; 831 were female.

Teachers in intervention schools took part in the intervention components described below. Teachers in both intervention and control schools participated as research participants. All were sixth grade teachers; 72.6% were female, 47.2% held a graduate degree, 38.4% had done some graduate work, and 14.4% reported their highest degree as a four-year degree. Student participants were the sixth grade students of these teachers in the intervention and control schools. For these students, 53.6% were female and 51.3% were classified as ethnic minority (African American, Latino, or Native American ethnicity).

Intervention / Program / Practice:

The SEALS intervention is a professional development program that trains 6th grade teachers in the use of three complementary intervention components designed to foster supportive school contexts in early adolescence.

Academic Engagement Enhancement (AEE). The focus of this component is on research-based strategies for structuring and organizing the learning environment to maintain the attention and involvement of all students' difficulties (Gut, Farmer, Bishop, Hives, Aaron, & Jackson, 2004; Sutherland & Farmer, 2007).

Competence Enhancement Behavior Management (CEBM). From the *CEBM* component (Farmer, Goforth, Hives, Aaron, Jackson, & Sgammato, 2006; Sutherland & Farmer, 2007), teachers learn to teach and reinforce appropriate classroom behavior while providing constructive consequences to reduce problem behavior. The *CEBM* model was developed from evidenced-based practices for promoting positive classroom behavior (e.g., Johns & Carr, 1995; Lewis, Sugai, & Colvin, 1998; Nelson, 1996; White, Algozzine, Audette, Marr, & Ellis, 2001).

Social Dynamics Management (SDM). *SDM* is an inservice training and directed-consultation model to enhance teachers' awareness of classroom social dynamics and the corresponding impact of such dynamics on students' academic engagement and classroom behavior (Farmer, 2000; Farmer & Xie, 2007; Farmer, Xie, et al., 2007). Teachers learn to identify students' peer groups, social structures, and social roles (e.g., leaders, followers, isolates) in the peer system, as well as how to recognize and prevent bullying and social aggression.

Each intervention component is designed to complement the others, resulting in a collective impact on what teachers do in the classroom (e.g., teacher attunement); how teacher functioning influences student functioning and creates a peer and classroom context that supports and reinforces positive student functioning; and how, in turn, teacher functioning, school and peer context conditions, and student functioning contribute to students' academic outcomes (see Figure 1). The model reflects the idea that in order to promote positive adjustment in early adolescence, it is important to reorganize the academic, social, and behavioral capacities of both students and their schooling contexts.

Training. The goal is to teach teachers specific strategies, and provide them with a framework for using these strategies in a systematic manner to promote a supportive and engaging school context. SEALS is multicomponential and designed to move teachers' understanding and skill-set from more general to more advanced levels. Training involves: 1) a site visit by intervention staff that includes directed observations and consultation with 6th grade teams of teachers and school personnel in the spring semester prior to the intervention year; 2) a

1 ½ day summer institute immediately prior to the beginning of school that provides an introduction to the three intervention components and involves direct instruction, group discussion, and hands-on activities to present and discuss the content; and 3) teachers' completion of 8 self-guided web-based instructional modules between September and March; and 8 directed consultation sessions corresponding to on-line modules, and accomplished through videoconferencing between intervention staff and the 6th grade teacher team at the school. On-line mechanisms are used to respond to issues that arise from geographic isolation of rural school districts.

Research Design:

Project REAL followed a cluster randomized control trial (CRCT) design, in which matched pairs of schools were identified and recruited for participation, and one of each pair was randomly assigned to the intervention or control condition. Paired schools were matched on multiple demographic variables (school size, student achievement, percentage minority, student poverty). Intervention schools received a professional development program for all sixth grade teachers (available to control schools following the end of Project REAL). The study followed a longitudinal design; baseline data were collected pre-intervention (spring of 5th grade), and during and post-intervention (fall and spring of sixth grade). Data sources included teacher and student survey completion, classroom observation, and school records.

Fidelity of intervention training was documented via logs of teacher participation. Project REAL teachers completed an average of 27.55 ($SD = 3.76$) hours of professional development. Fidelity of teacher implementation was determined by classroom observation of intervention and control school teachers by trained observers blind to condition. The instrument used was aligned with the intervention components and had acceptable psychometric properties scale reliability of .831-.929 (Cronbach's alpha, range for subscales) and .92 (overall scale), and interrater reliability of .881 (Kappa). Multilevel analyses for CRCT indicated that the instructional practices and classroom environments were significantly more aligned with the ideals of the intervention in intervention versus control schools (Hamm & Farmer, under review).

Data Collection and Analysis:

Data collection included gathering information via multi-informant measures to capture students' and teachers' perspectives of the peer context as well as participants' school adjustment and related risk factors. Student data were collected on-site in a group administration format, following a protocol that has been used with elementary school age students by the Project REAL PIs for over two decades. Teachers completed their assessments of study participants separately. Students received small gifts, and teachers received financial remuneration, for participating in the study. The following instruments were used for the current study:

Interpersonal Competence Configurations (ICCs). Configurations were generated from teachers' responses to the *Interpersonal Competence Scale-Teacher (ICS-T)*, an 18-item questionnaire consisting of seven-point Likert scales (Cairns, Leung, Gest, & Cairns, 1995). The ICS-T yields composite scores on multiple sub-scales: aggression, popularity, academic competence, affiliative, internalizing, and Olympian, as well as a total score that signifies overall student adjustment. Multiple studies indicate strong psychometric properties for this instrument (e.g., Cairns & Cairns, 1994; Cairns, Leung, Gest, & Cairns, 1995; Farmer, Irvin et al., 2006).

Cluster analyses (Aldenderfer & Blashfield, 1984) of ICS-T scores were used to discern distinct risk configurations separately for boys and girls at the end of the 5th grade (Wave

1) and end of 6th grade (Wave 3). The resulting male and female configurations for Wave 1 are presented in Tables 1 and 2. Labels are assigned with respect to whether or not students in a given cluster were higher or lower than average with respect to the 8 ICST subscales (i.e., aggression, affiliative, internalizing, academics, etc.).

School Valuing. Students rated their agreement with items such as “most of the things we learn in class are useless” on Voelkl’s (1996; 1997) widely used scale of the perceived worthiness of school to one’s future. Cronbach’s alpha exceeded .80 across studies; construct validity has been established through high correlations with academic achievement and class participation (Finn & Frone, 2004; Voelkl, 1996; 1997).

School Belonging. On Hagborg’s (1998) Psychological Sense of School Membership-Brief (PSSM-B) scale which focuses on the affective ties students feel toward their schools, students rated their agreement with statements such as “I am treated with as much respect as other students.” Strong psychometric data has been reported for this scale (e.g., Hagborg, 1998; Hamm, Farmer, Dadisman, & Robertson, 2007; 2009).

Social Preference. Using established sociometric procedures (e.g., Coie, Dodge, & Coppotelli, 1982), students nominated up to three students they liked most (LM) and least (LL). Social preference was calculated as the standardized number of nominations received for LM minus the standardized number of nominations received for LL (Coie & Dodge, 1983).

School Record Data. Schools provided participating students’ scores on statewide tests of reading and mathematics, as well as students’ overall grades. These scores were standardized within state to put them on a common metric (i.e., Z-scale). Grades were standardized by putting them on a 0 - 100 scale.

General Analytic Strategy. The dependent variables in these analyses were Wave 3 (spring of 6th grade) academic outcomes (grades, standardized test scores). The first set of analyses involved the total sample of REAL participants, and examined wave 2 (fall) and wave 3 (spring) process variables (e.g., school belonging, school valuing, social preference) as predictors of academic outcomes, after controlling on the academic outcome for the prior year. Next, analyses focused on students classified into one of the risk configurations (unengaged, studious, tough, and aggressive or multirisk for boys; aggressive, affiliative/internalizing or multirisk for girls). Analyses, performed separately by gender, examined relations among process variables and academic outcomes, to identify particular factors that promoted achievement gains among students at-risk (controlling for prior year academic outcome). Subsequent analyses focused on the interactions of particular process variables with specific configurations, to determine if students of particular types of risks benefited from particular school experiences. Generalized linear models (McCulloch & Searle, 2001) were used for all analyses.

Findings / Results:

For the **full sample** (i.e., risk and non-risk students; males and females combined), multiple SEALS process variables were associated with an improvement in student academic achievement. For **student grades**, Waves 2 and 3 school belonging, school involvement, and social impact were positively associated with Wave 3 grades (b’s ranged from .468 - .999, $p < .01$ for each), controlling on prior year grades. For **standardized test scores** (math and reading) school involvement at Wave 2 and Wave 3 was positively associated with Wave 3 **test scores** (b’s range from .083 to .141, $p < .05$), net of prior year test scores. In addition, social preference scores at Wave 2 and Wave 3 were positively associated with Wave 3 **test scores** (b’s are .049 and .044, $p < .05$), net of prior year test scores. Finally, Wave 2 school belonging, school

involvement, and social impact were positively associated with Wave 3 **composite ICST score** (b's ranged from .100 - .174, $p < .01$ for each), controlling on Wave 1 composite ICST score.

Among **boys identified as at-risk**, Wave 2 school belonging, school involvement, and social impact were positively associated with Wave 3 **grades** (b's ranged from .551 – 1.408, $p < .05$ for each), controlling on prior year grades. Parallel effects were found for the same process variables measured at Wave 3 (b's ranged from 1.1 – 1.3, $p < .05$ for each). For **standardized test scores**, Wave 3 school belonging had a positive association with Wave 3 scores ($b = .131$, $p < .05$), net of prior year standardized test score. Wave 2 school belonging, school involvement, and social impact were all positively associated with Wave 3 **composite ICST score** (b's ranged from .135 - .167, $p < .05$ or better for each), controlling on prior year **composite ICST scores**.

For the sample of girls identified as at-risk, Wave 2 school involvement was positively associated with Wave 3 **standardized test score** ($b = .321$, $p < .01$), net of prior year score.

In preliminary analyses involving a limited number **specific risk configurations**, for Tough boys, school belonging at Wave 2 and at Wave 3 ($b = 2.637$ and 1.698 , $p < .01$) was positively associated with Wave 3 grades net of prior year grades; as was Wave 2 school involvement ($b = 2.400$, $p < .01$). For Aggressive girls, Wave 3 school involvement had a positive association with grades (net of prior grades, $b = 2.321$, $p < .05$); for Multi-Risk girls, Wave 2 social preference was positively associated with Wave 3 grades net of Wave 1 grades ($b = 1.142$, $p < .05$). Analyses also identified relationships between process variables school involvement and social preference with standardized test scores for Unengaged and Multi-Risk boys and Multi-Risk and Aggressive girls.

Conclusions:

The current findings provide new insights into mechanisms that may contribute to gains in academic achievement for early adolescent boys and girls, particularly those at-risk for school failure. Findings for the whole sample support the SEALS model, particularly the importance of aspects of social status, experiences of the social-affective context, and student dispositions toward schooling. However, these findings highlight the need to attend to gender differences in Tier II and III follow-up interventions. For boys, dispositions toward school and aspects of social status differentiated the academic gains for boys at-risk. These dispositions were not influenced by the SEALS universal intervention (see paper 3) for boys in high-risk configurations; Tier II and Tier III intervention follow-up with respect to these types of process variables may be effective in promoting the academic success of high-risk boys. However, more positive school dispositions, social status, and experiences of the social-affective context did not consistently differentiate academic gains of high-risk from low-risk girls. In general, more attention is necessary to understand how to promote academic gains among at-risk girls, but aspects of social status and school involvement at minimum should be of focus in Tier II and III follow-up interventions. Additional analyses will be conducted to clarify further which specific risk configurations are in need of targeted intervention, and the process factors that are optimal targets for Tier II and III intervention follow-up among at-risk boys and girls.

Appendices

Appendix A. References:

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Appendix B. Tables and Figures

Figure 1: Intervention Model

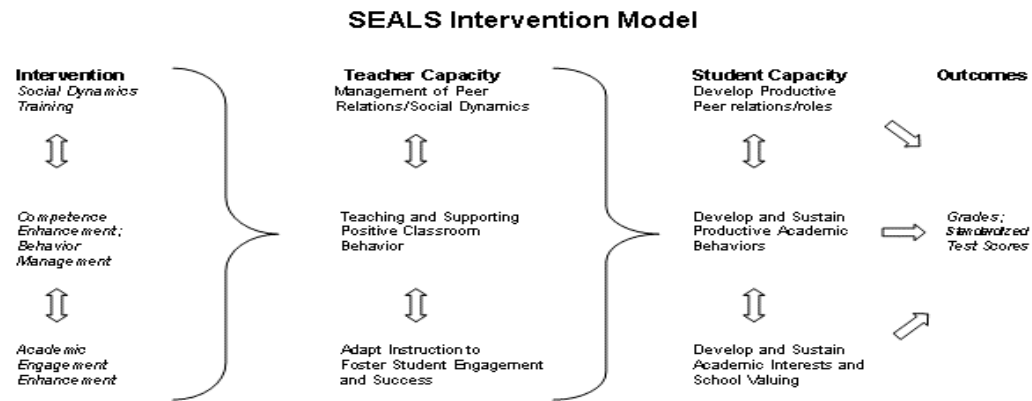


Table 1
Boys' Interpersonal Competence Configurations at Spring of Pre-Transition Year (Wave 1)

Clustering Variable	Unengaged	Studious	Tough	Aggressive	Multi-Risk	Model
ICS-T Factor						
Popular	-.57 (.68) ***	-.17 (.67) *	.75 (.60) ***	-.41 (.71) ***	-1.59 (.58) *	1.04 (.61) ***
Olympian	-.61 (.70) ***	-.26 (.61) ***	.60 (.69) ***	-.24 (.71) ***	-1.54 (.73) ***	1.12 (.64) ***
Affiliative	.01 (.79)	.18 (.70) **	.48 (.67) ***	-.73 (.74) ***	-1.59 (.88) ***	.88 (.59) ***
Academic	-1.14 (.47) ***	.54 (.57) ***	-.25 (.81) **	-.11 (.85)	-.44 (.98) **	1.19 (.41) ***
Internalizing	.61 (.83) ***	.50 (.74) ***	-.68 (.64) ***	-.16 (.68) **	1.52 (.81) ***	-.74 (.74) ***
Aggressive	-.42 (.69) ***	-.65 (.64) ***	.27 (.73) ***	1.09 (.60) ***	.38 (.98) *	-.89 (.66) ***
Cluster n	97	111	134	137	48	102

Note. N = 629 boys. Cells contain means on ICS-T clustering variables for corresponding interpersonal competence configuration (standard deviations given in parentheses). *** $p < .001$, ** $p < .01$, * $p < .05$ for the T-tests of the mean (versus a value of 0).

Table 2

Girls' Interpersonal Competence Configurations at Spring of Pre-Transition Year (Wave 1)

Clustering Variable	Aggressive			Studious			Affiliative Internalizing			Multi-Risk			Model			
ICS-T Factor																
Popular	-21	(.79)	**	-.07	(.72)		-.48	(.71)	***	-1.22	(.71)	***	1.04	(.53)	***	
Olympian	-19	(.71)	**	.04	(.65)		-.70	(.65)	***	-1.16	(.77)	***	1.02	(.65)	***	
Affiliative	-.58	(.76)	***	.23	(.70)	***	.30	(.64)	***	-1.52	(.80)	***	.74	(.56)	***	
Academic	-.25	(.82)	***	.54	(.057)	***	-1.21	(.65)	***	-.72	(.87)	***	.72	(.62)	***	
Internalizing	-.14	(.76)	*	.23	(.68)	***	.45	(.80)	***	1.24	(.79)	***	-.92	(.66)	***	
Aggressive	1.33	(.69)	***	-.59	(.48)	***	-.36	(.63)	***	.25	(1.09)	*	-.33	(.74)	***	
Cluster n	143			178			113			92			201			

Note. N = 727 girls. Cells contain means on ICS-T clustering variables for corresponding interpersonal competence configuration (standard deviations given in parentheses). *** $p < .001$, ** $p < .01$, * $p < .05$ for the T-tests of the mean (versus a value of 0).