

Helping Students Reappraise Social and Academic Adversity During the Transition to Middle-School: A District-Wide Replication of a Mindset Intervention

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Background:

The developmental and structural transition from childhood to adolescence and elementary to secondary schools introduces significant risks. Transitioning secondary students generally move from a familiar neighborhood elementary school to a new school that is farther from home, larger, less personal, and more formal and evaluative (Eccles et al., 1993). Larger, malleable peer networks become more competitive (Anderman, 1999) and teacher-student relationships become more distant (Wentzel, 1997). At this critical and stressful developmental stage, students' *social belonging* in school, or their perception of having positive relationships with peers and trusted adults (Walton & Cohen, 2011), can waver.

Focus of Study:

Drawing on psychological insights for promoting social belonging, we developed an intervention designed to help students reappraise concerns about fitting in at the start of middle school. In 2014-15, we conducted the first experimental evaluation of this approach in Madison, WI (Borman et al., 2018). Academic, social-psychological, and behavioral benefits were widespread, with districtwide impacts for 6th grade students across the 11 schools. Given these promising outcomes, we sought replication in the Paradise Valley Unified School District (PVUSD), AZ.

Setting

The intervention was implemented during the 2016-17 academic year in all seven of the PVUSD middle schools. All PVUSD students transition from elementary to middle school in 7th grade.

Participants:

All 2,316 7th graders across the 7 schools were included. Applying listwise deletion of student records with missing data, we identified two analytical samples: the *school administrative records sample* (n= 2,065) and the *student survey sample* (n= 1,652). Baseline data for these two samples revealed no statistically significant treatment-control differences (see Table 1). Student attrition rates were 11% and 31% for the administrative data and student survey samples, respectively. Rates of attrition for treatment and control were statistically equivalent for both analytical samples.¹

Intervention:

Social-psychological theory posits that when students in a new school context encounter adversity, such as getting a bad grade or having no one to sit next to at lunch, they often question their personal academic and social competence (Walton & Brady, 2017). However, when students reappraise these challenges as normal phenomena that most everyone experiences

¹ The differential attrition rate is less than 1% for the school administrative records sample ($\chi^2(1, N = 2,065) = 0.35, p = .56$) and less than 2% for the student survey sample ($\chi^2(1, N = 1,652) = 0.80, p = .37$).

initially, they are better positioned to view their struggles as external and changeable, rather than as internal and unchangeable—a mindset that facilitates improved school engagement and performance (Dweck, 2006).

The student exercises feature quotations and stories ostensibly from a “survey” of the prior year’s beginning middle-school students. These accounts align with students’ sentiments, as expressed to us in prior focus groups, but we “reinterpreted” them to convey two core messages: (1) beginning middle-school students often struggle to fit in socially and academically at first but, over time, come to realize they belong; and (2) other students and teachers can help. The first exercise focused on worries about succeeding academically, while the second focused on concerns about fitting in with peers. Control exercises included the same amount of reading and writing but asked students to read and write about neutral topics.

Data Collection and Analysis:

The two interventions were offered during the first term of the school year (September and November). The exercises were provided to students by regular teachers during English Language Arts classes. Throughout all phases of implementation, students and teachers were blind to experimental condition.

Within each of the 7 schools, students were randomly assigned to treatment or control. We collected pre- and post-intervention survey data on measures of students’ reported well-being (i.e., Trust in the adults in the school; Social belonging; Evaluation anxiety; and Valuing doing well at school) and, via school transcripts, obtained students’ academic and behavioral data, including attendance, disciplinary records, and class grades. Finally, manipulation checks in the form of five-point Likert items were included at the end of both exercises.

Our primary intention-to-treat (ITT) research question is: *Does assignment to the social-belonging intervention impact beginning middle-school students’ cumulative post-treatment (second, third, and fourth term) GPAs?* This question was addressed using the following multiple regression model:

$$Y_i = \alpha + \beta(Treatment_i) + \sum \varphi X_i + \varepsilon_i$$

Y_i represents the measured GPA outcome for student i , α represents the model intercept, β is the coefficient representing the impact of treatment assignment, $\sum \varphi X_i$ includes the pre-intervention covariates (i.e., first-term GPA, gender, free/reduced price meal status, and special education status, and a series of six indicators representing seven school-level randomization blocks), and ε_i is the student error term. Similar models evaluated impacts on the aforementioned behavioral and social-psychological outcomes.

Results:

The results of the manipulation checks are presented in Table 2. After completing the exercises, treatment students reported that they, in the months to come, like the previous students mentioned in the exercises, anticipated experiencing fewer academic and social worries than their control-group counterparts.

In Tables 3 and 4, we present the results of the ITT analyses of, respectively, the school administrative records outcomes and the student survey outcomes. As expected, intervention

students had statistically significantly higher GPAs and fewer failing grades. However, no impacts were found for absences and disciplinary referrals. Student reports of well-being unexpectedly revealed no treatment effects.

Conclusion:

These results indicate that the intervention can produce replicable impacts on academic outcomes. The prior Madison, WI study produced an effect size on GPA of $d = .09$ and $d = -.11$ for reducing failing grades, while this replication produced impacts of $d = .06$ and $d = -.06$, respectively. The manipulation check suggests treatment students reappraised their social and academic worries, as theorized. However, treatment students' social-psychological outcomes nor their school attendance and disciplinary outcomes were affected. Over time, belonging interventions initiate a positive recursive cycle, which reinforces initial impacts (Beilock et al., 2017). We will track the students for two additional academic years to determine whether the intervention may, indeed, impact students' long-term academic success.

Appendices

Appendix A. References

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Appendix B. Tables

Table 1. Student Sample Characteristics and Baseline Equivalence for School Administrative Records Sample (N = 2,065) and Student Survey Sample (N = 1,652).

<i>School Administrative Records Sample (N=2,065)</i>				
	Control	Treatment	Test	<i>p</i> -value
Female	50.3%	49.7%	0.40	0.53
Threatened Student	30.0%	35.7%	3.16	0.08
FRL	35.8%	37.6%	0.66	0.42
Special Ed	9.3%	7.8%	1.48	0.22
Term 1 GPA (7th Grade)	3.33	3.32	0.35	0.72
<i>Student Survey Sample (N=1,652)</i>				
	Control	Treatment	Test	<i>p</i> -value
Female	50.2%	49.8%	0.02	0.88
Threatened Student	28.6%	32.7%	3.20	0.07
FRL	31.5%	32.2%	0.09	0.76
Special Ed	9.1%	7.1%	2.22	0.14
Term 1 GPA (7th Grade)	3.27	3.31	-1.34	0.18
School Trust	4.04	4.06	-0.68	0.49
Social Belonging	3.94	3.94	0.09	0.93
Evaluation Anxiety	2.81	2.86	-1.01	0.31
ID with School	4.68	4.72	-1.39	0.17

Note: Null hypothesis test for binary variables is chi-square test and t-test for continuous variables.

Table 2: Outcomes of Manipulation Checks for Exercise 1 and 2.

How much did last year's 7th graders experience academics and social worries at the beginning of 7th grade and how do they feel now that they are in 8th grade...

Variables	Academic Worries Exercise 1		Social Worries about "Fit" Exercise 2	
	Worry Before	Worry Now	Worry Before	Worry now
Treatment = 1	0.06 (0.05)	-0.85*** (0.04)	0.22*** (0.05)	-0.15** (0.05)
Racially Threatened = 1	-0.08 (0.06)	0.05 (0.06)	-0.07 (0.06)	0.07 (0.06)
Female = 1	0.17*** (0.05)	0.16*** (0.04)	0.29*** (0.05)	0.21*** (0.05)
Free/Red. Lunch Eligible = 1	0.08 (0.07)	0.11 (0.06)	0.07 (0.07)	0.08 (0.07)
Special education = 1	-0.20* (0.10)	-0.08 (0.09)	-0.03 (0.09)	0.09 (0.10)
Term 1 Grade GPA	0.08* (0.04)	-0.08* (0.04)	0.08* (0.04)	-0.06 (0.04)
School ID number = 2	0.06 (0.07)	-0.04 (0.07)	0.14 (0.07)	0.08 (0.07)
School ID number = 3	-0.11 (0.12)	-0.06 (0.10)	-0.14 (0.11)	0.05 (0.12)
School ID number = 4	0.10 (0.08)	-0.01 (0.07)	0.34*** (0.08)	0.09 (0.08)
School ID number = 5	-0.02 (0.09)	0.12 (0.08)	0.04 (0.09)	-0.03 (0.09)
School ID number = 6	-0.14 (0.10)	-0.07 (0.09)	-0.19* (0.10)	0.07 (0.10)
School ID number = 7	0.05 (0.10)	0.09 (0.09)	-0.02 (0.10)	0.14 (0.10)
Constant	-0.38* (0.16)	0.57*** (0.15)	-0.59*** (0.16)	0.07 (0.16)
Observations	1,721	1,721	1,721	1,721
R-squared	0.026	0.201	0.069	0.027

Note: Standard errors in parentheses;
 *** $p < .001$, ** $p < .01$, * $p < .05$.

Table 3. Analyses of Intention-to-Treat Impacts on Term 2, 3, and 4 Grades, Absences, and Office Disciplinary Referrals (N=2,065).

Variables	GPA	Ds and Fs	Absences	Disciplinary Referrals
Treatment = 1	0.06* (0.02)	-0.21* (0.10)	-0.32 (0.32)	0.01 (0.07)
Racially Threatened = 1	-0.07* (0.03)	0.15 (0.13)	-0.35 (0.43)	0.08 (0.10)
Female = 1	0.11*** (0.02)	-0.26** (0.10)	0.59 (0.33)	-0.28*** (0.08)
Free/Reduced Lunch Eligible = 1	-0.21*** (0.03)	0.64*** (0.14)	1.32** (0.47)	0.17 (0.11)
Special education = 1	0.02 (0.04)	-0.38* (0.18)	-0.81 (0.59)	-0.20 (0.13)
Sixth Grade GPA	1.09*** (0.02)	-3.89*** (0.08)	-3.71*** (0.26)	-0.68*** (0.06)
School ID number = 2	0.37*** (0.04)	-1.50*** (0.15)	-0.36 (0.51)	-0.17 (0.12)
School ID number = 3	0.48*** (0.05)	-1.27*** (0.22)	-2.26** (0.73)	-0.47** (0.17)
School ID number = 4	0.25*** (0.04)	-1.03*** (0.17)	-1.10* (0.55)	0.08 (0.13)
School ID number = 5	0.50*** (0.05)	-2.05*** (0.19)	-1.60* (0.63)	-0.37** (0.14)
School ID number = 6	0.30*** (0.05)	-1.14*** (0.20)	-2.10** (0.68)	0.50** (0.15)
School ID number = 7	0.03 (0.05)	-0.18 (0.20)	-0.60 (0.67)	1.06*** (0.15)
Constant	-0.98*** (0.08)	16.23*** (0.32)	22.59*** (1.05)	2.86*** (0.24)
Observations	2,065	2,065	2,065	2,065
R-squared	0.728	0.662	0.122	0.151

Note. Standard errors in parentheses;
*** $p < .001$, ** $p < .01$, * $p < .05$.

Table 4. Analyses of Intention-to-Treat Impacts on Measures of Student Well-Being (N=1,652).

Variables	School Trust	Social Belonging	Evaluation Anxiety	Valuing Doing Well in School
Treatment = 1	0.04 (0.05)	0.00 (0.05)	0.01 (0.05)	0.08 (0.05)
Racially Threatened = 1	-0.06 (0.07)	0.04 (0.07)	-0.01 (0.07)	-0.04 (0.07)
Female = 1	0.01 (0.05)	-0.27*** (0.05)	0.08 (0.05)	0.08 (0.05)
Free/Reduced Lunch Eligible = 1	0.04 (0.07)	0.06 (0.07)	-0.04 (0.07)	0.08 (0.07)
Special education = 1	0.29** (0.09)	0.08 (0.09)	-0.06 (0.09)	0.02 (0.09)
Sixth Grade GPA	0.16*** (0.04)	0.18*** (0.04)	-0.11** (0.04)	0.22*** (0.04)
School ID number = 2	-0.01 (0.07)	0.00 (0.07)	0.19* (0.07)	0.14 (0.07)
School ID number = 3	0.16 (0.11)	-0.06 (0.11)	0.15 (0.11)	0.03 (0.11)
School ID number = 4	0.05 (0.08)	-0.07 (0.08)	0.23** (0.08)	0.10 (0.08)
School ID number = 5	0.09 (0.10)	-0.05 (0.09)	0.10 (0.10)	0.07 (0.09)
School ID number = 6	-0.23* (0.11)	-0.30** (0.11)	0.14 (0.11)	0.10 (0.11)
School ID number = 7	-0.05 (0.11)	-0.21 (0.11)	0.12 (0.11)	-0.15 (0.11)
Constant	-0.60*** (0.17)	-0.47** (0.17)	0.21 (0.17)	-0.89*** (0.17)
Observations	1,652	1,652	1,652	1,652
R-squared	0.023	0.034	0.016	0.030

Note. Standard errors in parentheses;
 *** $p < .001$, ** $p < .01$, * $p < .05$.