Abstract Title Page

Title: Effects of Check & Connect on Attendance, Behavior, and Academics: A Randomized Effectiveness Trial

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Background / Context:

Although graduation rates in the US have improved from 51.3% in 1972 to 89.6% in 2010, dropout remains a serious social and economic issue, particularly among low-income students and non-white student subgroups (Chapman, Laird, & KewalRamani, 2010). The causes of dropout are varied and complex but several distinct and malleable factors have been identified Four of the most salient and pliable student-level factors linked to dropout are academic achievement, attendance, engagement, and behavior (Allensworth & Easton, 2007; Balfanz, Herzog, & Mac Iver, 2007; Henry, Knight, & Thornberry, 2012; Kurlaender, Reardon, & Jackson, 2008; Ou, Mersky, Reynolds, & Kohler, 2007; Rumberger & Lim, 2008; Silver, Suanders, & Zarate, 2008). As such, many dropout prevention and intervention programs target these risk factors.

Communities In Schools (CIS; www.communitiesinschools.org) is one of the largest and most widely disseminated dropout prevention programs that specifically target academic achievement, attendance, engagement, and behavior. CIS is a nonprofit, nationwide network of nearly 200 independent affiliates delivering a dropout prevention and intervention model in more than 3,000 schools across 28 states. The CIS model uses school-based case managers to develop community partnerships, bring local resources to school campuses, and provide direct services to schools and students at risk of dropping out. Although CIS outlines a specific process for service delivery that targets the four predictors of dropout, the CIS model does not specifically prescribe interventions. That is, local affiliates utilize local data to select empirically-based interventions that fit local school and student needs. One local CIS affiliate in Texas was challenged with a large group of non-white students who exhibited school attendance problems—one of the four risk factors accounting for the largest proportion of variance in dropout.

To address the challenges CIS was experiencing with absentee students, CIS staff partnered with a university research group to implement a field-based trial of Check & Connect (C&C; Sinclair et al., 1998). C&C is a widely-used intervention for improving school attendance and reducing dropout; however, the evidence base for C&C largely relies on less than optimal studies implemented by the program developers. The study reported here implemented C&C within a CIS service delivery model. That is, all participating CIS schools implemented universal, school-wide interventions and individualized case management services to improve academics, behavior, and attendance. However, within participating CIS schools, students were randomly placed in one of two conditions: (1) CIS services plus C&C or (2) CIS-only services.

Purpose / Objective / Research Question / Focus of Study:

The present study evaluates the effectiveness of C&C in a randomly assigned sample of students who were all receiving CIS services. The research questions for the study include: Are there differences in attendance, academics, and behavior for CIS students who also receive C&C compared to students who only receive CIS services? The proposed poster will report effects of the intervention as implemented over the course of the 2011-2012 school year.

Setting:

Nine middle schools, four high schools, and one middle/high school located in a large urban region of the southwestern US comprised the setting for the study. In the participating schools, the average number of students enrolled was 1,113 (range = 173 - 2901) and attendance rates ranged from 84.7% to 95.5% (mean = 92.3%). Participating schools, on average, had high

rates of economically disadvantaged students (mean = 86%; range = 68.9% - 94.7%), as measured by participation in the subsidized lunch program and a large proportion (mean = 62%; range = 41.7% – 100%) of students meeting criteria to be considered at-risk (e.g., single parent family, low income, academically below grade level).

Population / Participants / Subjects:

Demographic details for the 189 participating students that comprise the analytic sample are reported in Table 1. To be eligible for participation, students must have met eligibility criteria for CIS services (see Texas Education Code sections 29.081 and 33.151) and demonstrated absenteeism (defined by 20 or more absences during the prior school year or 2 or more absences during the previous month). Participating students averaged 5.06 days absent and .23 disciplinary referrals at baseline. About half of the participants were female (56%) and the majority of students were Hispanic (89%). The average age of the participants was 15.1 years and the majority (74%) received free or reduced-price lunch.

Intervention / Program / Practice:

C&C is a manualized dropout prevention intervention designed to promote students' engagement in school through a targeted and individualized approach (for a full description of C&C, see http://checkandconnect.umn.edu and Sinclair et al., 1998). The C&C model comprises two primary components. The *check* component involves regularly monitoring student data related to alterable risk indicators. The *connect* component involves building relationships with students and families and facilitating basic or intensive interventions, based on student data. The C&C model is delivered by an adult "monitor," who uses a case management approach to work with students and their families for the duration of the intervention. The primary goal of the monitor is "to keep education a salient issue for the student, his or her family members, and teachers, and to reduce and prevent the occurrence of absenteeism, suspensions, failing grades and other warning signs of school withdrawal" (Sinclair et al., 1998, p. 10). The monitor works with students and families on his or her caseload to promote school engagement by building and maintaining relationships, monitoring student data related to alterable risk indicators, and implementing individualized interventions with students and families based on the data.

In this study, CIS site coordinators acted as the C&C monitors. The C&C monitors were school-based practitioners who had been employed with CIS for a mean of 4.38 years. The monitors provided C&C to up to 12 students in addition to providing CIS services to their regular caseload. The monitors recorded attendance, disciplinary infractions, and academic performance weekly on a form adapted from Sinclair et al. (1998). The data were used to provide feedback to students, determine students' level of risk, and develop and implement individualized interventions based on risk indicators. Monitors met with students weekly to discuss progress and the importance of staying in school and assist students with problem solving related to current or ongoing issues. For students exhibiting high risk on the indicators being monitored, individualized interventions were developed according to student risk factors and needs.

Research Design:

This study used a randomized block design to examine the effectiveness of C&C on academic performance, behavior, and attendance with at-risk middle and high school students. Eligible students were randomly assigned to the treatment or control condition within each of the 14 participating schools. In fall 2011, prior to the start of the intervention and after parent consent and student assent, 134 students were assigned to the treatment condition (C&C + CIS) and 126 were assigned to the control condition (CIS only).

Due to attrition, posttest data were available for 189 of the 260 students randomized to the treatment and control groups (see Figure 1). The total (27%) and differential (13%) attrition rates were relatively high, although not uncommon in school-based field research with at-risk students in urban settings (see Wilson et al., 2011; Wilson & Lipsey, 2006). Analysis of selection bias and pretest equivalency of the analytic sample suggested that the analytic treatment and control groups were statistically balanced at pretest (see Table 1).

(Please insert Figure 1 and Table 1 here)

Data Collection and Analysis:

Pre and posttest measures of attendance, grades, and disciplinary infractions were collected from the first and last marking period report cards respectively. Performance composites for all students in the dataset, using English, mathematics, science, and social studies grades, were generated at pretest (α = .73) and posttest (α = .82). Disciplinary infractions were measured by the number of office referrals at pre and posttest and attendance was measured by the number of days absent at pre and posttest.

Hierarchical Linear Modeling (HLM) controlled for the school-level random effects. All models included pretest functioning and relevant student and school covariates. Student-level covariates included free and reduced lunch status, race, gender, age, grade, and family income. School-level covariates included school size and the percentage of students considered at-risk, highly mobile, disadvantaged, of limited English proficiency, and the percent of students meeting state achievement standards. A stepwise HLM model estimation procedure was used to fit each dependent variable (Raudenbush et al., 2002). In step 1, an unconditional, fixed effects model was fit to each outcome to estimate the intraclass correlation—or the proportion of variance in outcomes attributed to school-level effects. The intraclass correlation (ICC) for academic performance (ρ = .09), discipline (ρ = .15), and attendance (ρ = .12) indicated that 9%, 15%, and 12% of the variation in posttest outcomes were attributed to school-level effects, respectively—sufficient magnitudes to warrant the use of hierarchical linear modeling. In step 2, conditional models were fit to test the intervention effects. In step 3, random slope and intercept models were tested by fitting cross-level interactions and random effects. Random effects and interaction terms were retained in the models only if significant. All associations were assessed by using a two-tailed test and α = .05. Model estimates were generated in STATA 11.0 (StataCorp, 2005), using *xtmixed* and a maximum likelihood estimator—which performs well when the number of level 2 units is not large (Bryk & Raudenbush, 1992).

Following model estimation, effect sizes were estimated using approaches suggested for multilevel data for all outcomes significantly associated with C&C (Cohen, 1988; Spybrook, Raudenbush, Congdon, & Martínez, 2009). Figure 3 represents the effect size equation, where β is the multilevel coefficient for the treatment variable on the outcome of interest, τ^2 is the residual variance between schools, and σ^2 represents the residual variance within schools.

Findings / Results:

The multilevel model estimates are offered in Table 2. Controlling for pretest performance and all relevant student and school level characteristics, significant differences at posttest were observed favoring treatment participants compared to control students on grades (β=1.547 (p = .043, 95% CI [.047-3.048]) and disciplinary infractions (β-.363, p=.036, 95% CI [-0.70-0.02]). Effect sizes for attendance (δ = 0.07) and disciplinary infractions (δ = 0.27) were small to moderate. Contrary to prior studies, no significant differences for attendance were observed (δ = -0.01). Using the improvement index as suggested by the Institute of Education

Sciences (2008), these effect sizes translate into a 3% percentile improvement in grades, an 11% percent reduction in disciplinary referrals and a 0.04% percent improvement in attendance for the average student in the intervention compared to one in the control condition.

(Please insert Table 2 here)

Conclusions:

The present study examined the effects of C&C with a diverse sample of students at high risk for dropout as defined by high rates of absenteeism, poor school behavior, and below-average academic performance—three critical risk factors in predicting eventual dropout. In several specific ways the current study extends the existing evidence for C&C. First, the present study is one of the first independently evaluated, randomized effectiveness trials of C&C. Second, the sample of student participants in the present study consisted largely of Hispanic students. Prior studies of C&C have not specifically examined the effects of the program for this subgroup of students who appear to be at increased risk for dropout compared to other non-white students (Chapman et al., 2010). Lastly, though the findings are mixed and the effects are relatively small, the estimates derived in this study resulted from an intent-to-treat analysis of a well-defined intervention using an effectiveness approach to examine the impact of the intervention under real world conditions. Findings from such studies suggest schools can feasibly implement and use C&C to improve outcomes for at-risk students. Moreover, this randomized, field-based trial demonstrates that local university-school-community partnerships may contribute to the scientific evidence-base by evaluating interventions in real-world settings.

As with all studies, the present study has important limitations that condition the generalizability of the findings. First, total and differential attrition rates exceeded acceptable attrition rates established by What Works Clearinghouse (WWC) to "meet evidence standards." As such, the WWC guidelines for randomized controlled trials with high attrition rates were followed in that we examined baseline equivalence on student characteristics and outcome variables and controlled for demographics and pretest scores in all analytical models. Moreover, the analytic sample was balanced on observed variables at pretest. Second, students received C&C over a relatively short period—six months rather than the 2 years recommended by Sinclair et al. (1998). As a result, students may not have received the full benefits conferred by extended exposure to C&C, possibly explaining the smaller effect sizes observed. Our choice of outcomes—school-reported grades, office disciplinary referrals, and attendance—was both pragmatic as well as purposeful. That is, schools and the CIS affiliate were interested in positively affecting these proximal outcomes. Outcomes can be specific to school settings and may not always be generalizable across settings even though these data are commonly used in studies reporting the effects of school-based interventions (Irvin, Tobin, Sprague, Sugai, & Vincent, 2004). Despite these obvious limitations, randomization of students within schools boosts internal study validity and reduces bias resulting from different practices across schools settings.

This randomized study of C&C contributes empirical evidence in support of C&C with a different sample of at-risk students from prior studies of C&C—Hispanic and absentee students—and adds a level of internal validity rarely found in studies of school-based intervention research. Moreover, this study provides evidence of the effects of C&C implemented in a real-world setting by school-based practitioners, situating effect sizes within the context of C&C being implemented under conditions that practitioners would normally experience.

Appendices

Appendix A. References

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Appendix B. Tables and Figures

Table 1

Demographic Characteristics and Pretest Equivalence of Treatment and Control Groups

	Total (N = 189)		C&C (n = 89)		Control (n = 100)			
Variable	%	*N*	%	*n*	%	*n*	$X^2(df)$	*P*
Sex								
Male	44%	84	38%	34	50%	50	2.66 (1)	.10
Female	56%	105	62%	55	50%	50		
Grade								
6th	20%	37	19%	17	20%	20		
7th	15%	28	14%	13	15%	15		
8th	21%	40	24%	21	19%	19		
9th	23%	43	45%	19	24%	24	1.71 (6)	.10
10th	7%	13	21%	5	8%	8		
11th	6%	12	8%	7	5%	5		
12th	8%	16	8%	7	9%	9		
Ethnicity								
African American	11%	20	15%	13	7%	7	2.88 (1)	.09
Hispanic	89%	169	85%	76	93%	93		
Free or reduced lunch								
Yes	74%	140	72%	64	76%	76	0.41 (1)	.52
No	26%	49	28%	25	24%	24		

	M	*SD*	*M*	*SD*	*M*	*SD*	*t* (df = 187)[#]	*P*
Age	15.1	2.02	15.2	0.20	15.0	0.21	0.51	.61
Grade	8.35	1.80	8.34	0.19	8.36	0.18	0.04	.97
Income	42.46	36.69	43.03	3.95	41.35	3.63	-0.20	.84
Academic performance	75.63	8.70	76.56	7.73	74.78	9.46	1.36	.17
Discipline	0.23	0.65	0.169	0.65	0.30	0.72	1.38	.17
Attendance	5.06	4.47	4.63	3.83	5.44	4.97	1.25	.22

Table 2

Student-School Fitted Hierarchical Linear Models: The Effects of C&C (N = 189)

		Academic performance		Discipline		Attendance	
Level	Effect	*β*	*SE*	*β*	*SE*	*β*	*SE*
Student	Conditional mean	14.025***	7.262	2.019**	1.305	13.537*	7.776
	Pretest	.679***	.052	1.208***	.138	.731***	.123
	Age	-1.447**	.576	.076	.127	.760	.761
	Grade	1.418*	.738	-.188	.154	-1.310	.907
	Sex	.142	.829	-.149	.183	-.796	1.093
	Free lunch	-2.773**	1.125	-.070	.235	.551	1.392
	Income	.014	.011	-.003	.003	-.026*	.015
	African American	1.072	1.400	.544*	.139	-1.736	1.905
	Tx (C&C)	1.547*	.765	-.363*	.173	-.577	1.033
School	School size	.002	.003	-.000	.000	.002	.002
	% disadvantaged	.017	.263	-.009	.039	.235	.224
	% LEP	.415	.255	.035	.036	-.189	.202
	% at risk	-.171	.113	-.007	.016	.013	.089
	% mobility	.414**	.155	.021	.021	.062	.117
	% average performance	.079	.112	.017	.017	.015	.095

Note. All hypothesis tests are two tailed. Academic performance = composite of English, mathematics, science, and social studies; discipline = total number of office referrals; attendance = total number of days missed. Tx = C&C = 1, control = 0; income, and percentage of disadvantaged students, LEP (limited English proficiency), at risk, mobility, and average school-level performance all grand mean centered.
*$p < .10$. **$p < .05$. ***$p < .001$.

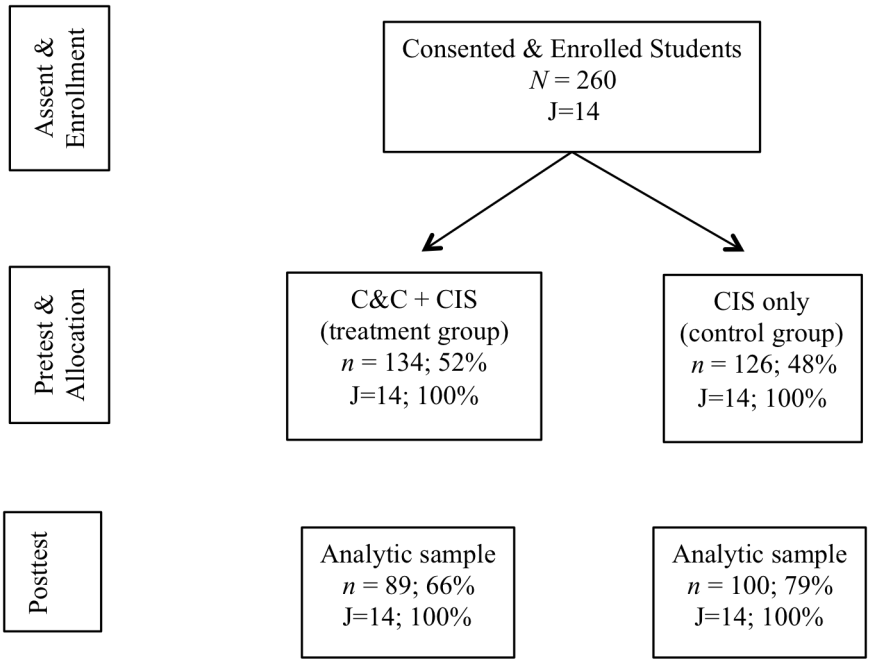

Figure 1. Participant flow chart. Participant percentages reported at each stage are calculated by using number of participants in prior stage. *N*(*n*) = number of students; J(*j*) = number of schools.