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Examining the Impact of Policy and Practice Interventions on High School Dropout and School Completion Rates: A Systematic Review of the Literature

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The purpose of this literature review is to systematically examine policy and practice intervention research and assess the impact of those interventions on high school dropout and school completion rates. This systematic review extends the literature by (a) describing both policy and practice interventions, (b) synthesizing findings from experimental or quasi-experimental research, and (c) examining the common elements of effective interventions. Specifically, this review addresses two main questions. First, what are the characteristics of the empirical literature examining high school dropout or school completion interventions? Second, what are the common elements of effective policy or practice interventions for reducing high school dropout rates or increasing school completion rates? Findings indicate that despite research highlighting the need to address multiple risk factors and the need for early intervention, the bulk of current empirical research is focused on single-component, individual, or small group interventions delivered at the high school level. Further research is needed to provide guidance to schools regarding the integration of dropout efforts with other school initiatives. Multitiered frameworks of support are suggested as a structure for accomplishing this effectively and efficiently.

Keywords: dropout prevention practice, dropout prevention policy, high school dropout, high school completion

The issue of high school dropout is a serious concern for educators, policymakers, and the public. The economic and social consequences for those who do not complete high school have continued to climb as the demands for a more educated workforce have increased (Rumberger, 2011; Swanson & Editorial Projects in Education, 2009). Young adults who did not complete high school are more likely to be unemployed, to be welfare recipients, and when employed, to make less money on average than their peers who did complete high school (Rumberger, 2011; Swanson & Editorial Projects in Education, 2009). High school dropouts

are also more likely to suffer from depression or other mental health issues, join gangs or be involved in other criminal activities, and serve time in jail (Rumberger, 2011; Swanson & Editorial Projects in Education, 2009). These outcomes are a serious concern at the individual level and carry a large "social cost" (Belfield & Levin, 2007; Catterall, 1987).

Although there is a declining trend in overall high school dropout rates nationally (U.S. Department of Education, National Center for Education Statistics, 2012), progress has not been realized equally. One common way to define and quantify dropout is the status dropout rate, which represents the percentage of 16- to 24-year olds who are not enrolled in school and have not earned a high school diploma or General Equivalency Diploma (GED). The overall status dropout rate was 7.4% in 2010; however, dropout rates varied significantly by race (15.1% for Hispanics, 12.4% for American Indian or Alaskan natives, and 8% for African Americans, 4.2 % for Asian/Pacific Islander 5.1 % for Whites; U.S. Department of Education, National Center for Education Statistics, 2012) and income level (13.8% for those in the bottom quartile compared with 2.5% for those in the top income quartile; U.S. Department of Commerce, Census Bureau, Current Population Survey, n.d.). In addition, dropout rates in some urban areas remain high. In the 50 largest U.S. cities, the graduation rate in 2008 was just 52.8% (Swanson & Editorial Projects in Education, 2009). Therefore, understanding risk factors and identifying and implementing effective practices and policies to reduce high school dropout rates are critical.

Dropout Risk Factors

The characteristics of students who eventually dropout of high school, and their associated risk factors, have been well documented in research (e.g., Dynarski & Gleason, 2002; Mann, 1986; Prevatt & Kelly, 2003; Rumberger, 1995, 2011; Rumberger & Rotermund, 2012). No single risk factor can accurately predict drop out; however, prediction is more accurate when multiple risk factors are present (Bowers, Sprott, & Taff, 2013; Lan & Lanthier, 2003; Lee & Burkam, 2003; Neild, 2009; Neild, Stoner-Eby, & Furstenberg, 2008; Roderick & Camburn, 1999; Suh & Suh, 2007). Early identification of students at risk is possible as early as late elementary school (Grades 3–6) and quite accurate by freshman year (Allensworth & Easton, 2007; Balfanz, Herzog, & Mac Iver, 2007; Bowers et al., 2013; Carnahan, 1994; Catterall, 1987). Identification of low or failing grades especially when considered across time may be the most accurate single predictor of dropout (Allensworth & Easton, 2007; Bowers et al., 2013)

Risk factors have generally been described in two groups (Rumberger, 1983, 1995; Suh & Suh, 2007): status risk factors (i.e., parental education and employment, age, gender, SES, native language, mobility, family structure, and ability or disability) and alterable risk factors (i.e., academic failure, retention, attendance, misbehavior, early aggression). Although it is difficult to establish a clear causal link between any one risk factor and dropping out, the likelihood that a student will drop out increases when multiple risk factors are present (Lan & Lanthier, 2003; Lee & Burkam, 2003; Neild, 2009; Neild et al., 2008; Roderick & Camburn, 1999; Suh & Suh, 2007). Factors both in school (i.e., behavior and academic performance) and out of school (i.e., community factors, engagement in deviant

behaviors) can affect a student's decision to drop out (Rumberger & Rotermund, 2012). Goldschmidt and Wang (1999) suggest that the impact of individual and family risk factors on students may change as students get older.

Researchers have also begun to explore the diverse profiles of students who drop out of school and suggest the presence of several subgroups. (Bowers, 2010a, 2010b; Bowers et al., 2013; Fortin, Marcotte, Potvin, Royer, & Joly, 2006; Janosz, Archambault, Morizot, & Pagani, 2008; Janosz, LeBlanc, Boulerice, & Tremblay, 2000; Lessard et al., 2008). Typically, these subgroups have been defined by shared dropout characteristics. Initially researchers identified four main groups: students who are (a) disrupting school, (b) chronically struggling with academics, (c) bored with the process, or (d) quiet dropouts (Bowers & Sprott, 2012a, 2012b). However, there is disagreement among researchers about the actual number and characteristics of subgroups, and further studies indicate that in larger samples there may be only three subgroups: quiet, jaded, and involved (Bowers & Sprott, 2012b). The quiet group of students makes up the largest percentage of dropouts and includes students with lower academic performance, lower attendance, and lower extracurricular involvement. Jaded students are the second largest group and tend to dislike school, have the lowest academic performance, and be absent or suspended the most. Involved students also struggle academically and behaviorally (although less than the other subgroups) but are more frequently in school and are highly involved in extracurricular activities (Bowers & Sprott, 2012b). Further research is needed to clearly identify the number and defining characteristics of these subgroups (Bowers & Sprott, 2012b) because the effects of typical status, alterable or school-level risk factors on student outcomes may vary based on the subgroup of the student (Fortin et al., 2006; Janosz et al., 2000), and identification of the subgroups, rather than viewing all potential dropouts together, may guide schools toward more effective and targeted interventions (Fortin et al., 2006; Janosz et al., 2000; Menzer & Hampel, 2009).

Researchers have also begun to discuss risk factors related to school characteristics (i.e., school policies, poverty concentration, school size, course offerings, and relationships between teachers and students; Bryk & Thum, 1989; Lee & Burkam, 2003; Rumberger, 2011; Rumberger & Thomas, 2000). For example, after accounting for individual student characteristics, students are still more likely to drop out when they attend schools that are perceived as having unfair discipline climates or higher percentages of students misbehaving (Rumberger, 1995, 2011; Wehlage & Rutter, 1986). Goldschmidt and Wang (1999) report that school-level factors account for a significant level of variation in dropout rates after individual student and family characteristics are accounted for. Researchers have also suggested that dropout rates alone may not be an adequate measure of effectiveness (Rumberger & Palardy, 2005). School-level variables and policies may affect student achievement as well as the likelihood that a student will transfer to another school. Rumberger and Palardy (2005) argue that academic achievement, student transfers, and dropout rates should be considered together when evaluating school effectiveness. There is an emerging literature that is beginning to conceptualize the dropout problem as a system-level failure in need of a systemic tiered intervention (Lee & Burkam, 2003; Lehr, Hansen, Sinclair, & Christenson, 2003; Mac Iver, 2011).

Previous Reviews of Dropout Interventions

Given the national attention the dropout problem has received, there is a surprisingly little information about effective practices or policies and even less on the integration and effective implementation of practices and policies. Most research has focused on identifying risk and protective factors or describing prevention or intervention programs, and much of the research has relied on correlational statistics or descriptive case studies rather than on experimental design (Lehr et al., 2003; Prevatt & Kelly, 2003).

Additionally, many practices currently used do not have strong evidence of effectiveness (Dynarski & Gleason, 2002). The What Works Clearinghouse (WWC) has identified 19 programs that are designed to help students (a) graduate, (b) complete school, (c) stay in school, or (d) progress in school. Of these 19 programs, 7 are school-level interventions. Four of these seven (Career Academies, Talent Development High Schools, Accelerated Middle Schools, High School Redirection) have some evidence of positive effects on staying in school but no strong evidence that they are effective with helping students complete school.

Only five WWC identified programs for individuals or small groups have positive or potentially positive effectiveness ratings for helping students complete school; however, four out of five of these programs are recovery programs, which provide students with GEDs, and only one is focused on preventing students from leaving high school in the first place. Of the programs designed to be implemented with individual students, only Talent Search had evidence that it helps students complete school and New Chance had evidence that it improved students' chances of completing a GED. Check & Connect, ALAS, Financial Incentives for Teen Parents, and Twelve Together show evidence of helping students stay in school, but WWC reports no strong evidence that these programs lead to high school graduation. Descriptions of these programs and the criteria used by WWC in their review can be found at http://ies.ed.gov/ncee/wwc.

In addition to the WWC reviews, there are several dropout prevention practice guides that have been published (e.g., Balfanz, Fox, Bridgeland, & McNaught, 2009; Dynarski et al., 2008; Hammond, Linton, Smink, & Drew, 2007; Schargel & Smink, 2001). These guides provide recommendations for best practices based on what is known from research as well as on expert opinion. The Institute for Educational Science practice guide provides six key recommendations, which are similar to those made in other practice guides (Dynarski et al., 2008, p. 6):

- Use data systems to identify students at risk early.
- Provide adult advocates to students at risk.
- Provide academic support and enrichment.
- Implement programs to improve students' classroom behavior and social skills.
- Provide personalized learning environments and individualized instruction.
- Provide rigorous and relevant instruction to better engage students in learning.

The practice guides offer schools and districts a menu of options for addressing the dropout problem; however, they do not address the integration of these practices into a comprehensive model (Mac Iver & Mac Iver, 2010). In addition, in an attempt to create a practical guide for educators, these reviews focus primarily on practice interventions. They combine research findings with expert opinion and have not clearly differentiated results from experimental or quasi-experimental research from correlational or descriptive studies. There is a need for a rigorous, systematic review of both policy and practice intervention studies that have used experimental research designs.

The purpose of this literature review is to systematically examine both policy and practice intervention research and assess the impact of those interventions on high school dropout rates and school completion rates. This systematic review extends the literature by (a) describing both policy and practice interventions, (b) synthesizing findings from experimental or quasi-experimental research only, and (c) examining the common elements of effective interventions. Specifically, this review addresses the following questions:

Research Question 1: What are the characteristics of the experimental literature examining high school dropout or school completion interventions?

Research Question 2: What are the common elements of effective policy or practice interventions for reducing high school dropout rates or increasing school completion rates?

Method

Article Identification Process

We used a multiphase process to identify articles for inclusion in this review. The process included (a) a systematic search of electronic databases, (b) abstract screening for four key criteria (empirical study, policy or practice intervention study, K–12 population, dependent variable [DV] = dropout rates or school completion rates), (c) full article screening to determine if articles met all inclusion criteria, and (d) an ancestral search of all included articles' reference lists.

Electronic Search

We conducted a search of six common psychology and educational electronic databases (Academic Search Premier, ERIC, Professional Development Collection, PsychARTICLES, Psychology and Behavioral Sciences Collection, and PsycINFO), which included all articles indexed on or before June 2012, to identify empirical studies of policy or practice interventions directed at reducing high school dropout rates or increasing school completion rates. Search terms included variations and combinations of the following terms: high school, dropout programs, dropout prevention, high school graduation, high school graduation rate, completing high school, positive behavior interventions and supports, PBIS, school completion, and high school completion rate. To ensure the academic rigor of research studies, search results were limited to peer-reviewed publications. After removing duplicates, this search process resulted in 558 abstracts for review.

Abstract Review

We read and coded abstracts for each citation to determine if the full article should be reviewed using the following criteria. First, as an initial screen for quality and rigor the article needed to be a peer-reviewed empirical study. That is, we excluded the many literature reviews, position papers, program reviews or descriptions, and books or chapters focused on dropout interventions. Although these are important contributions to this topic, this review is focused on the characteristics of experimental literature, and evidence suggests that although not infallible, the peer review process does provide important checks on research quality and relevance (Fletcher & Fletcher, 2003; Morey, Garner, Faruque, & Yang, 2011; Roberts & Shambrook, 2012). Second, the article needed to test policy interventions, which affected an entire state or regional population, or practice interventions, which affected a specific group or school. Empirical studies of risk factors or outcomes for students who drop out of high school were excluded. Third, the policy or practice intervention needed to be preventative (i.e., not a recovery program) and directed and implemented at the K–12 level. Interventions implemented at the early childhood or adult level or exclusively with students who had already dropped out of high school (recovery programs) were excluded. Community-based, school-based, and mixed interventions were included to provide a comprehensive picture of the policy and practices that have been used to reduce high school dropout rates. And finally, one of the DVs measured needed to be either high school dropout rate or high school completion rate. A total of 88 of the 558 (16%) articles reviewed were retained for full article review. Specific abstract coding and inclusion criteria are included in Table 1.

Full Article Review

We read and reviewed each article to determine if the article met each of the criteria used for the abstract review as well as two additional criteria. First, the intervention study needed to be experimental (i.e., group experimental, group quasi-experimental design with a control group, experimental single-subject designs, or mixed-methods including one of these elements). We excluded studies that did not achieve experimental control (i.e., qualitative studies, case studies, correlational studies, pre–posttest designs without a control group, or single-subject studies without sufficient replications). Second, because of the contextual nature of dropout behavior, intervention studies that were implemented outside the United States were excluded. A total of 26 of the 88 (30%) articles reviewed during this process were retained for inclusion in this review. This included 10 policy intervention studies and 16 practice intervention studies. Specific full article coding and inclusion criteria are included in Table 2.

Ancestral Search

To ensure a comprehensive review of relevant literature, we conducted an ancestral search from the reference lists of the 25 articles that were retained after full article review. We located each citation in the reference lists of included articles and evaluated the abstract based on the criteria in the abstract review. A total of 976 abstracts were reviewed as part of this process. Fifteen abstracts were identified through both the initial search procedures and the ancestral search. Of

TABLE 1

Specific coding and inclusion definitions for abstract review

Type of paper (select one)	
Empirical[a]	Including all data-based articles (e.g., single subject, correlational descriptive, group design, meta-analyses, etc.)
Review paper	Example, literature reviews, practice reviews, or systematic review without data)
Position paper	Description of a practice/policy in the field including author(s) position on practice/policy reviewed
Books/chapters	
Editorial or commentary	Primarily an opinion piece
Program description or practice paper	Description of a strategy or a practice without original supporting data
Other	Include narrative description.
Topic of paper (select all that apply)	
Intervention paper[a]	Paper discusses or tests interventions (interventions can be practices or policy).
Risk factor paper	Paper discusses or tests risk factors.
Outcome paper	Paper discusses outcomes associated with dropout.
Participant population (check all that apply)	Must include at least one[a] item.
Elementary[a]	Grades K–5
Middle[a]	Grades 6–8
Secondary[a]	Grades 9–12
K–12[a] (or some other grade span that includes 9–12 and other grades)	Other grade span combinations
Early childhood	Prekindergarten or preschool
Adult/post–high school	
Recovery	Intervention implemented with a participant who has already dropped out of school.
Other	Include narrative description.
DV variable (check all that apply)	Must include at least one[a] item.
Dropout[a]	DV is a direct measure of dropout rate (regardless how it was calculated).
School completion[a]	DV is a direct measure of numbers of students who complete high school.
DV-specific risk factor	DV is a measure of a risk factor directly tied to drop out.
Specific outcome factor	DV measures specific outcomes experienced by students who drop out of school.

Note. DV = dependent variable.

[a]Definitions indicate inclusion criteria.

TABLE 2

Specific coding and inclusion definitions for full article review

Research design (select all that apply)	
Qualitative	
Group and group quasi-experimental[a]	It is an experimental design with or without randomization comparing differences between groups on a dependent variable as a result of an independent variable with a control group.
Correlational and causal comparative	Studies that look at determining the relationship among groups on a dependent variable without experimental manipulation of an independent variable. Includes pre–posttest designs without a control group.
Single-subject experimental[a]	Researcher establishes experimental control through use of single subject research designs (e.g., reversal withdrawal, multiple baseline, alternating treatments, changing criterion, and other modifications of these designs).
Case study	Results are reported in single-subject fashion but experimental control was not achieved (e.g., pre–post measures, single-participant case studies, concurrent multiple baselines, etc.).
Mixed-methods	Study used multiple research design types to answer the research question—check all that apply and mixed-methods.
Other	Include narrative description.
Sample size	List number of students and/or schools included in the study.
Databases used	List specific national data bases used to obtain data for the study.
Study context (select one)	
International	Study intervention was implemented outside of the United States.
Domestic[a]	Study intervention was implemented inside the United States.

[a]Definitions indicate inclusion criteria; articles must have met all abstract criteria (Table 1) to be considered for full coding.

the 976 abstracts reviewed, 16 new articles met the criteria for full article review. After full article review, a total of 6 of those 16 articles were retained for inclusion in this review (one policy intervention study and five practice intervention studies). The reference lists of these 6 newly identified articles were also included in the ancestral search procedures. In total, we reviewed 1,519 unique abstracts, passed 104 abstracts to full coding, and retained a total of 32 articles (11 policy and 21 practice intervention studies) in the final fully coded sample. Sample

characteristics, settings, research design, mode of analysis, independent variables and DVs, and results of all included policy and practice intervention studies are included in Tables 3 and 4, respectively.

Coding Procedure

To summarize the existing empirical literature on dropout interventions, we coded each retained article across five categories, recording codes for all characteristics that applied. First, we recorded codes for specific experimental research methods (group experimental, group quasi-experimental, specific single-subject design) and modes of analysis (descriptive statistics, inferential statistics, visual analysis, effect sizes, other). Second, we recorded specific demographic characteristics for which results were reported (race, gender, sexual orientation, special education, socioeconomic status, other). Third, we recorded specific methods for calculating dropout or school completion variables and categorized any additional DVs into four groups (academic, behavioral, attendance, other). Next, we categorized specific intervention characteristics into six groups: academic intervention, behavioral intervention, attendance intervention, study skills intervention, school/organizational structure intervention, and other. Intervention components are defined in Table 5. Additionally, we categorized the target group size for the intervention (individual, small group, grade level, school, tiered, state, other) and wrote a brief narrative description of each intervention. Finally, we summarized reported results (increased, decreased, no change, or mixed results) for each category of DV (dropout, school completion, academic, behavioral, attendance), noted statistical significance or effect sizes for each DV result, and recorded a brief narrative summary of recommendations.

Due to significant variability in the independent variables across studies (i.e., policy vs. practice intervention components, implementation fidelity) as well as significant concerns about study design elements (i.e., lack of matched treatment and control groups, low sample sizes, failure to account for threats to external and internal validity) a full meta-analysis was not conducted. Instead, we conducted a systematic search and coding procedure and use a narrative summary to describe the current literature base and its implications. Meta-analysis can be useful for summarizing the effects of interventions across studies however, caution is warranted in the use of these procedures when such variability across study components and quality exist and when the purpose of the review can be accomplished adequately through a systematic narrative review (Deeks, Higgins, & Altman, 2008).

Interobserver agreement was calculated for 30% of all decision points (abstract and full article screening codes) and for 30% of fully coded articles. Two doctoral students in special education read and coded 30% ($k = 455$) of abstracts and a third doctoral student in special education read and coded 30% ($k = 32$) of full articles. Interobserver agreement was calculated by dividing the total number of codes in agreement by the total number of possible codes. The average abstract coding agreement score was 91% (range: 79% to 100%). Initial full article coding agreement was 97% (range: 94% to 100%); and all areas of disagreement on fully coded articles were discussed, resolved, and recoded by consensus.

(Text continues on p. 230.)

TABLE 3

Sample characteristics, settings, research design, mode of analysis, independent and dependent variables, and results of all included policy intervention studies

Study	Sample characteristics/data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Bishop, Mane, Bishop, and Moriarty (2001)	State aggregate data for all 50 states from NCES and U.S. Census Bureau NELS-88 nationally representative longitudinal data set United States	Quasi-experimental with nonrandom control group *Descriptive statistics* Trends in dropout rates *Inferential statistics* Logit regressions predicting effects of state policy on dependent variables	Compulsory attendance laws State-mandated minimum course requirements State MCE Hybrid end-of-course exam/minimum competency exam in New York/North Carolina State standard–based reforms	Dropout rates Enrollment rates GED completion Graduation timing NAEP 4th- and 8th-grade tests in reading, math, and science College enrollment rates Earnings of workers Unemployment	School attendance laws have a small but positive effect on enrollment rates. States with high course requirements had significantly lower enrollment rates, higher dropout rates, and higher GED rates. MCE had no effect on dropout rates or enrollment rates overall. New York's hybrid system had significant effects; students were more likely to dropout, get a GED, graduate early, and graduate late. Students with B averages living in states with MCE were more likely to graduate late and more likely to finish with a GED. Students with C averages had lower school completion rates, higher late graduation rates, and higher GED rates when they lived in states with MCE. Academic achievement increased in states with end-of-course exams and MCE. End of course exams more effective at raising achievement then rewarding or sanctioning schools/teachers or state MCE Stakes for schools and teachers do have a positive effect on achievement.

(continued)

TABLE 3 (continued)

Study	Sample characteristics/data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Booker, Sass, Gill, and Zimmer (2010)	Florida: statewide longitudinal data on 4 cohorts of 8th-grade students—multiple data sources but primarily K–20 Education Data Warehouse Chicago: 5 cohorts followed longitudinally from Chicago public school data	Quasi-experimental matched control group *Descriptive statistics* % of students who graduate from public vs. charter schools Race of students who attend charter schools *Inferential statistics* Regression analysis of effect of attending charter school on the likelihood of graduating	Charter school attendance	Graduation rate College attendance rate	Charter school attendance is associated with increased school completion rates and college attendance. Reasons are unclear—school size, grade configuration and academic achievement differences do not explain the discrepancy between charter attendance and public school attendance.
Campbell, Breitmayer, and Ramey (1986)	Subgroup of larger randomized study of children born to disadvantaged parents Outcomes for teenage parents (age 17 or younger), $N = 29$ from original sample of 109; fourteen experimental day care support 15 control group; all teens in HS or junior high when children were born; all mothers were single for much of the time covered in the study United States—specific location not reported	Group experimental design. *Descriptive statistics* Summary of differences between experimental group and control group on maternal age, education, first child, single, and families eligibility for AFDC *Inferential statistics* *T* tests between groups	AFDC for teen parents	Success rating (composite variable including mother significantly involved in raising child, completed HS, or made 4 years educational progress in 4 years, and the family did not use AFDC) Results calculated for composite variable as well as component variables	Treatment group mothers were more successful (71% to 47%; $p < .095$). Treatment group mothers were significantly more likely to finish HS and receive post-HS training (46% to 13%). Results not statistically significant but very small sample size made significant results unlikely.

(continued)

TABLE 3 (continued)

Study	Sample characteristics/data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Carnoy (2005)	State aggregate data for all 50 states from NCES and U.S. Census Bureau	Quasi-experimental—nonrandom control group *Descriptive statistics* Because of small sample of states exit exams group differences reported as actual differences *Inferential statistics* Regression analysis to determine differences between groups on progression rates and graduation rates because of strength of state accountability standards	Strength of state accountability standards (0–5 scale) State-level HS exit tests	School progression rates Graduation rates Retention rates	Graduation rates for one cohort show a statistically significant positive relationship between high accountability policies whereas a second cohort shows a nonsignificant negative relationship between high accountability state policy and graduation rates. Relationship between high accountability and retention rates positive and statistically significant for one cohort. Relationship between high accountability and progression rates statistically significant and positive.
Filindra, Blanding, and Coll (2011)	Aggregating the ELS HS graduation variable for to the state level Combined with state-level policy data $N = 3{,}438{,}020$; children of immigrants = 306,128; U.S.-born children with U.S.-born parents = 2,293,380 United States	Quasi-experimental nonrandom control group *Descriptive statistics* Description of status of immigrant children living in all 50 states *Inferential statistics* Multivariate OLS analysis	Policy context Immigrant welfare scale Multicultural Disposition Scale Political context Ranney Party Control Index	Graduation rates of immigrants Difference in graduation rates	Immigrant welfare scale—significant positive association with graduation rates. Multicultural Disposition Scale—negative association with graduation rates ($p < .1$) Political context—highly significant positive association with graduation rates in democratic states. Difference in graduation rates lower in democratic states, and when immigrant welfare scale is higher.

(continued)

TABLE 3 (continued)

Study	Sample characteristics/data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Harris, Jones, and Finnegan (2001)	San Diego School Department, Department of Human Services 16- to 18-year-olds Excluded: pregnant or parenting teens, teens in foster care, teens in private schools, teens who had graduated, and teens who were working as an alternative to school	Group experimental *Descriptive statistics* Differences between experimental and control groups *Inferential statistics* Logistic multivariate regression	Case management and financial penalty to the teen's parent's public assistance if attendance was less than 80%	Student has a graduation certificate (student was eligible for graduation in their senior year)	In June 1998, 57.4% of experimental group had graduation certificates compared with 55.4% of control group; not a significant difference. Placement at an alternative school rather than a comprehensive school was the strongest predictor of graduation; students in comprehensive schools were more likely to graduate.
Jacob (2001)	NELS—follows nationally representative sample of students from 8th-grade through post-HS Data on HS graduation exams comes from states, districts or schools $N = 12{,}171$ 15 states: Alabama, Florida, Georgia, Hawaii, Louisiana, Maryland, Mississippi, Nevada, New Jersey, New Mexico, New York, North Carolina, South Carolina, Tennessee, Texas	Quasi-experimental—nonrandom control group *Descriptive statistics* Student demographic characteristics in states *Inferential statistics* OLS regression	State graduation exams	Dropout rate Academic achievement: math and reading	Students in states with graduation exams score significantly lower on achievement tests (2 points) and have higher chance of leaving HS (10.1% to 8.5%); the difference in dropout probability based on graduation exams is not statistically significant for full sample but is for students in the bottom 25% of achievement levels; these students are 6.5 points (25%) more likely to drop out in states with graduation tests. States with graduation tests also serve a more disadvantaged population.

(continued)

TABLE 3 (continued)

Study	Sample characteristics/data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Landis and Reschly (2011)	NCES—Common Core United States except Florida, California, Colorado, D.C., Maryland, and Michigan because of missing data For dropout/CSA changes analysis 9 states: Connecticut, Illinois, Indiana, Louisiana, Minnesota, Mississippi, Nebraska, South Carolina, Washington	Quasi-experimental nonrandom control group *Descriptive statistics* % of students who drop out in each grade Dropout rates across time *Inferential statistics* Chi-square analysis comparing states/regions	Compulsory attendance laws	Dropout rate School completion rate Dropout grade level	Mixed results: some states that raised CSA ages saw increases in dropout rates while others saw decreases. Overall small but significant relationship between CSA age and dropout grade level but no overall differences in dropout rates or school completion rates.
Marchant and Paulson (2005)	NCES—Common core and college boards SAT database United States 18 states had graduation exams 33 did not have graduation exams Regression analysis run on data from 45 states because of missing data	Quasi-experimental Nonrandom control group *Descriptive statistics* Explore differences between states with and without graduation exams *Inferential statistics* Means difference tests Multiple regression analysis impact of states requirements on graduation rates	Graduation exam	School completion rates SAT scores	Statistically significant difference in graduation rates between states with and without graduation tests; 8 percentage points ($p = .005$). The requirement for a HS graduation exam had a statistically significant negative effect on graduation rates and on SAT scores.

(continued)

TABLE 3 (continued)

Study	Sample characteristics/data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Schiller and Muller (2000)	NELS 1988–1992 and NELS of Schools *N* = 9,000 public school students United states Average of 180 students and 17 schools in each state	Quasi-experimental nonrandom control group *Descriptive statistics* Sample characteristics *Inferential statistics* HGLM analysis including student-, school-, and state-level variables	Broad policy categories Intensive monitoring Consequences for students Accountability for schools	HS completion rate	Extensiveness of testing had significant positive effects on log odds of receiving a HS diploma; also significant interactions with teachers assessment of risk and students own expectations. Consequences for students no significant overall effect but significant interactions with teacher assessment of risk. Consequences for schools no significant effect overall but significant interaction with teacher assessment of risk. State policies have a significantly greater effect on at-risk students. Extensiveness of testing policies and consequences for students increase likelihood of graduation. Accountability for schools decreases an at risk students likelihood of graduating
Warren and Hamrock (2010)	NCES—Common Core 36 states	Quasi-experimental nonrandom control group *Descriptive statistics* Minimum wage rates across time *Inferential statistics* Regression analysis Series of state and year fixed-effects models	Federal and State minimum wage rates	HS completion rate	Increasing minimum wage has no effect on HS completion rates.

Note. NCES = National Center for Education Statistics; NAEP = National Assessment of Educational Progress; NELS-88 = National Education Longitudinal Study of 1988; MCE = Minimum Competency Exams; GED = General Education Diploma; OLS = ordinary least square; CSA = compulsory school attendance; HS = high school; HGLM = hierarchical generalized linear model; AFDC = access to free educational day care.

TABLE 4

Sample characteristics, settings, research design, mode of analysis, independent and dependent variables, and results of all included practice intervention studies

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Catterall (1987) Catterall and Stern (1986)	*N* = 100 treatment, 20 select controls, 37 random controls Grades 10–12 Mean age 16.5 of treatment group Southern California urban HS HS and beyond database *N* = 2,739, 2,483 stayed in school, 256 dropped out in California	Group experimental but first-come first-served treatment group *Descriptive statistics* Student background and preexisting performance *Inferential statistics* ANCOVA: group differences Quasi-experimental, matched control group *Descriptive statistics* Sample characteristics and preexisting status *Inferential statistics* Logistic regression	4-day workshop conducted by counselors; workshop included collection of cognitive and behavioral approaches designed enhance self-esteem and to address problems of group members: in particular, low academic performance and negative relations with peers and adults 10-week follow up in common advisory period Alternative programs (alternative hours, schools for pregnant girls, cooperative vocational schools, or vocational work study (very small sample of students in these programs), concentrated vocational classes in regular HS	GPA Work habits Cooperation Class attendance Punctuality Self-perceptions and attitudes Dropout Dropout Wages Unemployment	GPA for the treatment group declined while control groups increased; results significant No significant effects for work habits, cooperation, class attendance, punctuality Self-perceptions and attitudes (perceived negative labeling by teachers and lower social boding to teacher) $p < .05$ 17% of treatment group were dropouts at time point measured compared with 13.5% of control groups; this is not a significant difference When matched based on student reports of likelihood of dropping out: students who took concentrated vocational classes were more likely to dropout than matched students who did not, while those in alternative programs were less likely to dropout than match students who were not in alterative programs (however, only 12 alternative program students in sample) When matched statistically no significant effects of either concentrated vocational classes or alternative programs When comparing students in schools with similar numbers of dropouts but not matching on individual characteristics: dropouts were less likely to have taken concentrated vocational education and less likely to have participated in alternative programs.

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Franklin, Streeter, Kim, and Tripodi (2007)	Treatment group 46, 39 comparison group, $N = 85$ Texas	Quasi-experimental Matched control group *Descriptive statistics* Sample characteristics and preexisting status Graduation rates comparisons *Inferential statistics* Chi-square analysis between groups Repeated-measures ANOVA for credits earned and attendance	Alternative school of choice based on a solution-focused alternative school framework • Classrooms grouped by subject area not grade level • Individualized self-paced instruction • Goal setting	Graduation Rates Credits earned Attendance	Treatment students had significantly lower attendance rates Solution-focused alternative school framework group showed significantly more improvement in the proportion of credits earned to credits attempted 67% of solution-focused alternative school framework 12th graders graduated that year while 90% of comparison group 12th graders graduated—but self-paced curriculum may play a role here and no statistical tests were reported on these differences

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Furstenberg and Neumark (2007)	10% of all students in Philadelphia school district starting in 8th grade *N* = 1,561 at third wave (sample has been questioned because dropout rates and completion rates differ between sample and population.)	Quasi-experimental Matched control group *Descriptive statistics* Group differences *Inferential statistics* Linear regression models using propensity score matched control group	EE programs: group of small programs that provide any combination of academic support, counseling, role models and career guidance Programs vary in comprehensiveness and intensity	Dropping out HS graduation Achievement while in HS Self-reported class attendance Educational aspirations and expectation College attendance	Participation in an EE program is associated with a significant ($p = .02$) decline in HS dropout (6.6%) and a significant ($p = .04$) increase in HS graduation rates (14.8%) Individual EE programs are significantly effective at reducing HS dropout (at the .05 level) and increasing school completion and are jointly significant at the .10 level No significant effect of EE program participation on self-reports of class attendance EE program participants were more likely (10.9%) to receive academic awards and nonacademic awards in HS EE program participants were more likely to enroll in post-secondary training Effects of EE programs stronger for students at neighborhood schools or vocational schools than for students at magnet schools
Kahne, Sporte, de la Torre, and Easton (2008)	Consortium on Chicago school research student and staff surveys and CPS administrative records Between 3 and 11 CHSRI schools (depending on cohort) compared with the rest of CPS nonalternative schools	Quasi-experimental—nonrandom control group *Descriptive statistics* Survey results *Inferential statistics* HLM	Conversion of large comprehensive HSs to smaller autonomous ones	Standardized test scores Dropout rates Graduation rates	Small school teachers reported significantly higher collective responsibility, teacher influence, sense of innovation, and expectations for postsecondary education Small school students reported significantly higher sense of belonging, peer support, student–teacher trust, and teacher support

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
					No significant differences in academic achievement Mixed results for attendance; small school students were absent fewer days than comprehensive school students (significant in 2/4 years) Only one cohort has been in small schools long enough to graduate. Small school graduation rate was 51% compared with 44%. Difference is marginally significant. $p = .09$ Dropout rates for juniors was 7% lower for one cohort ($p = .07$) and 1.5% lower ($p = .46$) for students in smaller schools
Lever et al. (2004)	FUTURES sites enroll 60 ninth graders who (a) have been retained at least one year in elementary/ middle school, (b) have attendance rates less than 85% in 7th grade, (c) academic scores at least one grade level behind in reading or math Baltimore	Quasi-experimental—non random control group *Descriptive statistics* Group differences *Inferential statistics* MANOVA, ANOVA	FUTURES: 5-year comprehensive program; begins summer before 9th grade; includes basic skills enhancement, work experience, motivation and leadership development, student support, transition services; summer program is paid and includes access to a mental health clinician; during school year 9th-grade FUTURES students attend smaller classes, receive extra support, receive positive incentives for achievement, and participate in cultural enrichment, character development, and career preparation	Graduation rates Dropout rates Youth self-report Postsecondary employment	1999: FUTURES programs 6.28% dropout rate compared with 10.98% for the school district overall. 2000: 5.12% compared with 8.14% in district; results achieved with a higher risk group of students; statistical tests not reported Youth self-report (behavioral outcomes), pre–posttest for treatment and nontreatment groups; significant effects for treatment and time on externalizing and internalizing behaviors; $p < .05$; both groups showed improvement over time; treatment group reported greater emotional and behavioral problems at both time points

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Levy, Perhats, Nash-Johnson, and Welter (1992)	Girls who were very young (11–15) and pregnant or 11–19 pregnant with mild mental retardation $N = 98$ pregnant girls with mild mental retardation and 228 elementary school–age pregnant girls Primarily Black or Hispanic Chicago	Quasi-experimental—nonrandom control group *Descriptive statistics* 3 cohorts followed longitudinally, comparisons to local and national statistics of pregnant teens since no comparative studies look at girls this young *Inferential statistics* Not reported	Children and adolescent pregnancy project Academic and health instruction through CPS through general or special education in self-contained school; onsite prenatal care, case management, home visits, prenatal and postnatal and parenting classes; after birth mothers transferred back to home schools with follow-up support for 18 months	Low birth weight Infant mortality Repeat pregnancy School dropout (not attending and had not completed school)	Children and adolescent pregnancy project participants had lower infant mortality rates than Chicago, lower dropout rates 30% compared with 70% of other pregnant teens in CPS and lower repeat pregnancy rates; birth weight statistics are inconclusive; statistical tests not reported; school attendance rates were lower for those with mild retardation; 56% in school vs. 71% of elementary-age mothers in the sample
Longstreth, Shanley, and Rice (1964)	$N = 7{,}529$ aggressive, 46 passive 75 control group of potential dropouts in regular school programming Southern California school system	Group experimental *Descriptive statistics* Group differences *Inferential statistics* Regression analysis	Small stable teacher–pupil ratio, vocational curriculum, immediate access to counselor, afternoon jobs for pay and school credit	Dropout rates Police contact rates Attitudes	Dropout numbers for experimental and control groups were equal Attitudes toward school improved in post interviews for all students; $p < .01$; however, when broken into subgroups aggressive students in the experimental group improved the most whereas all others developed poorer attitudes No evidence that enrollment in the program reduced police contacts

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Mac Iver (2011)	*N* = 117 program, 108 control students Subsequent checks showed: Program students had higher 8th-grade test scores than control students Data obtained from school district records 2 HSs in a large urban district in Maryland	Group experimental *Descriptive statistics* Group differences *Inferential statistics* Logistic regression analysis 9th graders randomly assigned to program or control groups	Adult facilitator to encourage attendance, course work, and address personal issues; facilitators reported monthly meetings with most students as well as several home visits and parent conferences each month and frequent meetings with teachers and administrators; facilitators discussed progress with students and helped with goal setting	On-time school completion Dropout Yearly attendance On-time promotion	Program students (35%) were somewhat less likely to dropout than control students (45.4%) And more likely to graduate 29.9% program, 23.1% control Regression analysis indicate 8th-grade attendance, and grades are more highly predictive of dropout or school completion than program participation Indicates program may have been implemented too late
McSparrin (1993)	*N* = 129 participant students, 602 control students who were pregnant and attending other Memphis schools; no pretreatment group differences were assessed School district records Memphis City Schools	Quasi-experimental with matched nonrandom control group *Descriptive statistics* Outcome differences between groups *Inferential statistics* Correlations between self-esteem and classroom success and attendance	Adolescent Parenting Program: Comprehensive program; students offered incentive for on-time attendance of $3.00 per day; money was used to purchase health and safety equipment for participants children	On-time attendance Courses passed Attitudes about education and the future	Participant students had slightly higher attendance rates than nonparticipating pregnant teens (no statistical tests reported) Participating student GPAs increased over previous years' GPA slightly. (no statistical tests reported) At end of study, 22% of participants had graduated compared with 37% of control group

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Meyer (1984)	School records reviews Cohort 1: 68 treatment, 80 control Cohort 2: 114 treatment, 73 control Cohort 3: 72 treatment, 60 control Follow-through students from Bainbridge School in Brooklyn compared with non–follow-through students in a school a few blocks away	Quasi-experimental with a matched control group *Descriptive statistics* Treatment/ control group differences prior to treatment *Inferential statistics* *T* tests comparing groups	Follow-through direct instruction: a 3-year program starting in kindergarten of intensive direct academic instruction; acceleration through program based on skill mastery	Graduated Retained Dropout Applied to college Accepted to college Reading and Math achievement	59.5% of treatment students graduated compared with 37.6% of controls aggregated across 3 cohorts. $p \leq .001$ 21.4% of treatment students were retained compared with 32.6% of controls. $p \leq .001$ 27.7% of treatment students dropped out compared with 46% of controls. $p < .001$ 34% of treatment students applied to and were accepted to college compared with 17% of controls; $p < .001$; aggregated reading achievement higher; $p < .01$; Math also higher, $p \leq .09$
Mezuk (2009)	CPS academic records and tournament registration records Matched with a random sample of students who attended same CPS schools $N = 2{,}614$ African American males, 458 participated in debate league CPS	Quasi-experimental with a matched control group *Descriptive statistics* Comparison of participant group to control group *Inferential statistics* Chi-square tests comparing groups Multivariate regression estimating the influence of debate participation	Urban Debate League participation	GPA ACT scores HS graduation	Higher performing students do self-select into debate leagues 77.4% of participants graduated compared with 54.5% of controls; $p < .001$ 7.2% of participants dropped out compared with 20.2% of controls; $p < .001$ Participants also had significantly higher academic achievement scores in all areas and significantly higher GPAs Significant effects remained after controlling for 8th-grade achievement

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Nowicki, Duke, Sisney, Stricker, and Tyler (2004)	*N* = 36 treatment students, 36 eligible but untreated controls, and 50 regular education controls Ballard HS in Louisville, Kentucky	Quasi-experimental with a matched control group *Descriptive statistics* Group differences *Inferential statistics* Repeated-measures ANOVA	Effective Learning Program Goals: Students develop internal locus of control Students learn language for interpersonal relations and how to use nonverbal communication effectively Lower student to teacher ratio 15:1, compared with 31:1. Students receive 3-hour afternoon block of language arts, math, social studies, and humanities instruction using Waldorf philosophy Reward days for high attendance	Locus of control Use of and interpretation of nonverbal communication Affective style	Graduation rates of Effective Learning Program participants (98%) was significantly higher than comparison students (38%) and greater than regular education graduation rate (74%) Nonverbal skill, locus of control, and affective style changed significantly in treatment group
Porowski and Passa (2011)	123 CIS HSs and 123 matched comparison HSs CIS HSs: 36 rural, 38 suburban, 49 urban NCES Common Core data Florida, Georgia, Texas, Michigan, North Carolina, Pennsylvania, and Washington	Quasi-experimental with a matched control group *Descriptive statistics* Net differences between groups *Inferential statistics* Repeated-measures ANOVA; CIS schools group had higher percentage of students receiving free or reduced-price lunch (38% vs. 32%)	CIS Annual school- and student-level needs assessments, comprehensive plans to deliver evidence-based practices to address needs at site Level-1 prevention services are short term and intended to address school wide needs Level-2 intervention services are targeted and sustained over time.	Promoting power (proxy for dropout) Graduation rate	CIS schools showed significant increases in promoting power over comparison groups, $p = .058$, and greater improvement over time; $p = .002$ Effect size = .21 High implementers saw greater improvements 3.6% vs. 1.5% improvement for low implementers Graduation rates also increased in CIS schools over comparison schools; 4.8% for high implementers vs. 2.5% for low implementers; effect size = .31

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Ramirez, Perez, Valdez, and Hall (2009)	Participants: 58 total: 44 females, 34 males of Mexican descent; had completed 1–4 years of the program Comparison group: Total 24: 7 males and 17 females completed 0 years of the program; instruction in an English immersion program Rancho Cucamonga, California	Quasi-experimental with a matched control group *Descriptive statistics* Sample characteristics *Inferential statistics* ANOVA/ MANOVA	Culturally Democratic Educational Environments: k–3 Bilingual multicultural program Equal instruction in 2 languages, individualized culturally relevant instruction, teaches respect for different cultures and tolerance for differences	Academic achievement HS graduation rates Fluency in English and Spanish Cultural values and participation	No significant differences on achievement scores Participants in the bilingual program were more likely to graduate from HS; $p < .001$ No significant effects for bilingualism or participation in culture other than mainstream American cultures
Sinclair, Christenson, and Thurlow (2005)	164 ninth graders randomly assigned to treatment or control; 85 treatment and 79 control students Students with emotional or behavioral disabilities Sample was 67% African American and 82% male Large urban district with high proportion of students with emotional or behavioral disabilities enrolled in comprehensive HSs	Group experimental *Descriptive statistics* Group differences *Inferential statistics* Significance of group differences	Check & Connect model of student engagement Continuous and systematic assessment of student levels of engagement with school. (attendance, suspensions, grades, credits) Individualized interventions provided by facilitators	Dropout rates Patterns of attendance (persisters, forced persisters, interrupters, and those out all year) School mobility School completion rates Special Education transition plan	Treatment students were less likely to drop out of school than control students at the end of 4 years (39% vs. 58%; $p = .03$, effect size = .18) or 5 years (42% vs. 94%; $p = .007$; effect size = .58) Treatment students were more likely to be persistent attendees and less likely to be out of school all year than control students during the students 3rd ($p = .037$; ES = .22), 4th ($p = .001$; effect size = .32), and 5th ($p = .031$; effect size = .48) year of HS Persistent attendees in their second year of HS were more likely to graduate ($p = .000$; effect size = .46) Treatment students were more likely to remain in one school within a year than control group students during 3 of the 5 study years Mobil treatment students were more likely to be persistent attendees. (60% vs. 20%; $p = .037$; effect size = .21) Treatment students were more likely to have completed high school or to still be enrolled in school at the end of 4 years than control students (61% vs. 43%; $p = .026$; effect size = .14)

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
					Treatment students were more likely to have a special education transition plan (p = .02; effect size = .26)
Sinclair, Christenson, and Evelo (1998)	94 students with learning or emotional disabilities, 47 treatment, 47 control All received intervention in 7th and 8th grade. Half (treatment group) continued to receive intervention in 9th grade. Northern Midwest urban school district	Group experimental *Descriptive statistics* Group differences *Inferential statistics* Significance of group differences	Check & Connect model of student engagement Continuous and systematic assessment of student levels of engagement with school (attendance, suspensions, grades, credits) Individualized interventions provided by facilitators	Enrollment in school at end of 9th grade Attendance patterns Credits earned Assignment completion	Treatment students were significantly more likely to be enrolled in school at the end of 9th grade (91% . 70%, p ≤ .05) and to have persistent attendance patterns (85% vs. 64%; p < .05), earn more credits (46% vs. 20%; p < .05), and complete course assignments (p < .05) than control group students
Solomon and Liefeld (1998)	88 adolescent mothers recruited, 49 intervention, 39 control group, 25 mothers dropped out (15 from intervention group and 10 from control group) Final: 63 participants, 34 intervention, 29 control in Pittsburgh, Pennsylvannia	Quasi-experimental, matched control group *Descriptive statistics* Group differences *Inferential statistics* Significance of group differences	Family Growth Center Provided postnatal coaching, home visits during first 6 months after birth, general social support, parenting advise and crisis intervention	High school dropout Repeat pregnancy	Treatment group mothers were significantly less likely to drop out of school (3/34 vs. 12/29; p = .002) than control group mothers Treatment group mothers were less likely to have had a repeat pregnancy at the 2-year follow-up (p = .02), but differences were not significant at the 3-year follow-up (p = .06)
Somers and Piliawsky (2004)	96 ninth graders, 46 experimental, 50 comparison group from the same school 99% African American and of lower sociodemographic status levels. Major city in the Midwest	Quasi-experimental matched control group *Descriptive statistics* Group differences *Inferential statistics* ANCOVA/ MANCOVA	Academic tutoring and social support After school, 2 hours, 2 days per week for 30 weeks; monthly enrichment programs to enhance designed knowledge of educational and career options and provide motivation and enhance self-esteem	Educational attitudes and behaviors GPA 9th-grade dropout rate	No significant differences between experimental and control group on GPA, educational attitudes, or behaviors 7.7% of treatment students dropped out at 10th grade compared with 13% of school overall. (significance tests not reported)

(continued)

TABLE 4 (continued)

Study	Sample characteristics/ data source/setting	Design and mode of analysis	Independent variable(s)	Dependent variable(s)	Results
Stern, Dayton, Paik, and Weisberg (1989)	11 academies Total number of students not reported Control groups derived from same HS that the academy was located in California Public HSs	Quasi-experimental Matched control group *Descriptive statistics* Group differences *Inferential statistics* Regression analysis	Academies within schools; grades 10–12; academy students take most classes together (English, math, science, and a lab or shop class); each academy focuses on one vocational area (health industry, computer occupations); partnerships with local employers provide 1:1 mentors	Attendance Credits GPA Courses failed Dropout probability	3/11 programs had statistically better attendance rates than control groups 6/11 programs students earned more credits than control students 3/11 programs students had higher GPA than control students 3/11 programs had higher numbers of courses failed than control groups 6/8 academies had lower dropout rates than comparison groups Estimated dropouts saved was 29, of which 21 or 22 were at Academy C
Weis and Toolis (2009)	$N = 282$, adolescents with conduct problems, 154 boys, 78 girls	Quasi-experimental	National Guard Challenge Program: voluntary military-style residential treatment program	Behavioral Functioning: BASC	Program completion status was related to increased behavioral functioning at 6 months but a decline (but still above pretreatment levels) at 36 months; $p < .001$
	210 treatment, 72 waitlist controls 58 treatment group participants withdrew prior to end of the program Wisconsin	Nonrandom waitlist control group *Descriptive statistics* Group differences *Inferential statistics* MANCOVA	22-week program Educational training, job skill development, physical fitness, leadership skills, health, sex and nutrition education, life coping skills, citizenship, community service	HS completion	No differences between treatment and control groups on behavioral outcomes at 36 months. (both groups improved) 91% of treatment student completed HS compared with 33.8% of control group Outcomes at 36 months not significantly related to gender; girls who completed treatment had significantly more behavioral issues than those who had withdrawn or controls

Note. BASC = Behavior Assessment System for Children; HS = high school; GPA = grade point average; HLM = hierarchical linear modeling; CIS = Communities in Schools; ANCOVA = analysis of covariance; MANCOVA = multivariate analysis of covariance; ANOVA = analysis of variance; MANOVA = multivariate analysis of variance; EE = educational encouragement; CHSRI = Chicago High School Redesign Initiative; CPS = Chicago Public Schools; NCES = National Center for Education Statistics.

TABLE 5

Intervention component definitions

Intervention component	Definition
Academic strategies	Intervention directly addresses academic knowledge or skills (e.g., tutoring in reading or math)
Behavioral strategies	Intervention directly addresses student behavior or social skills (e.g., social skill groups or direct teaching and reinforcing school expectations)
Attendance strategies	Intervention directly addresses student attendance or tardies (e.g., transportation to or from school, parent contact related to attendance, incentives for attendance)
Study skill strategies	Intervention directly addresses student study skills (e.g., test taking strategies, homework organization, or completion strategies)
School organizational or structural changes	Intervention directly changes a schoolwide organizational feature (e.g., schools within schools, 9th-grade academies or teams)

Results

Results are summarized in three parts. To provide an overview of the related experimental literature, the characteristics of all included studies are summarized and described first for policy studies and then for practice studies. Next, intervention components and findings from effective policy or practice interventions are synthesized and discussed. Figure 1 compares included intervention components for all studies. Academic and behavior interventions were the most frequently included components for practice studies, and school structure interventions were included most frequently in policy studies. Figure 2 compares the number of intervention components across studies. Most studies included only one or two intervention components.

Policy Intervention Studies

Description of Included Policy Studies

A total of 11 studies were included in this policy review. Publication dates for included studies ranged from 1986 to 2011. Group quasi-experimental studies comprise 82% ($k = 9$) of included studies (Bishop, Mane, Bishop, & Moriarty, 2001; Booker, Sass, Gill, & Zimmer, 2010; Carnoy, 2005; Filindra, Blanding, & Coll, 2011; Jacob, 2001; Landis & Reschly, 2011; Marchant & Paulson, 2005; Schiller & Muller, 2000; Warren & Hamrock, 2010) and 18% ($k = 2$) are group experimental studies (Campbell, Breitmayer, & Ramey, 1986; Harris, Jones, & Finnegan, 2001). Of the two included experimental studies, one was a subset analysis of a larger randomized trial that examined outcome for children born to disadvantaged parents. The subanalysis, which included only 29 students, focused on graduation rates for teen parents when free educational day care was provided (Campbell et al., 1986). The second study, examined the effects of financial

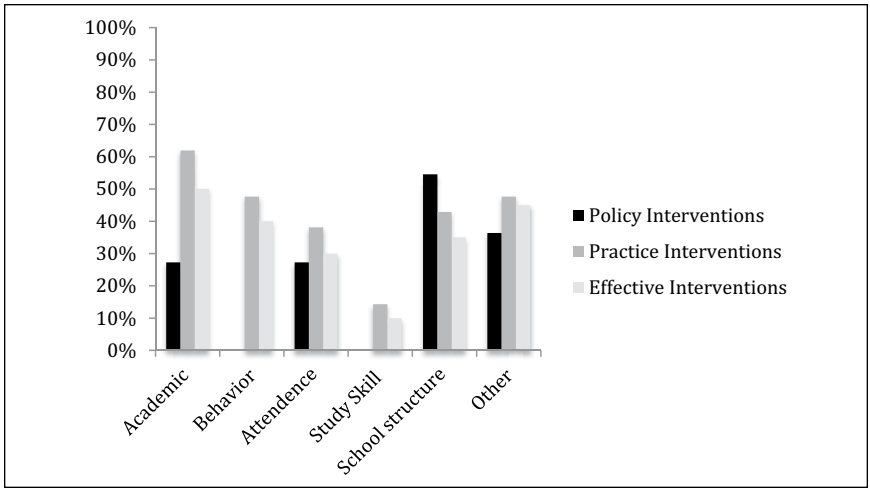

FIGURE 1. *Included intervention components across intervention types.*
Note. Categories are not mutually exclusive.

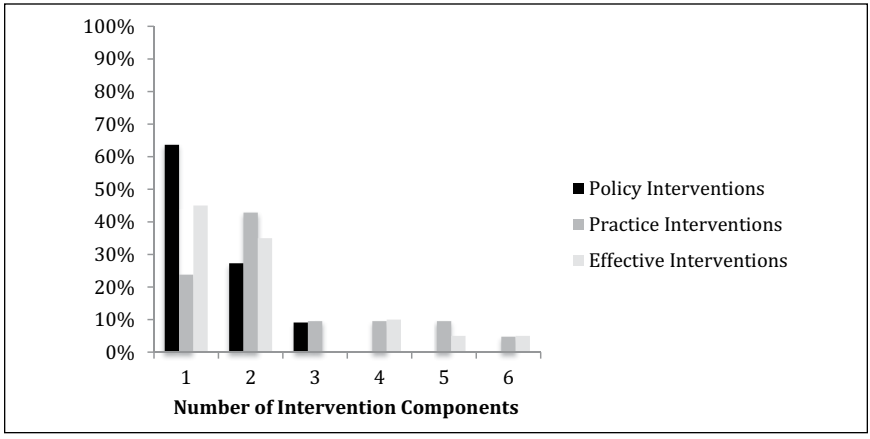

FIGURE 2. *Number of included intervention components across intervention types.*

penalties assessed on the student's parents if the student's attendance fell below 80% (Harris et al., 2001). Study details and results summaries are included in Table 3.

Results Reported

All studies reported both descriptive and inferential statistics. Additionally, two studies used visual analysis (Carnoy, 2005; Landis & Reschly, 2011), and one

study also reported effect sizes (Landis & Reschly, 2011). Seven studies disaggregated findings by race (Bishop et al., 2001; Booker et al., 2010; Carnoy, 2005; Harris et al., 2001; Jacob, 2001; Marchant & Paulson, 2005; Schiller & Muller, 2000), three reported findings by gender (Harris et al., 2001; Jacob, 2001; Schiller & Muller, 2000), and two reported results by socioeconomic status level (Jacob, 2001; Marchant & Paulson, 2005). In addition to high school dropout or school completion findings, three studies (27%) reported academic outcomes (Bishop et al., 2001; Jacob, 2001; Marchant & Paulson, 2005), and one (9%) reported attendance outcomes (Bishop et al., 2001). Marchant and Paulson's (2005) is a quasi-experimental study that reported results for student subgroups by race and socioeconomic level and reported academic and attendance outcomes in addition to graduation rates. This study examined the effects of exit exams on graduation rates and found that exit exams were associated with statistically lower graduation rates. However, no causal relationship can be inferred because this study was not a true experimental design.

Intervention Components

Interventions that targeted school structure or organizational characteristics were described in 55% of studies ($k = 6$; Bishop et al., 2001; Booker et al., 2010; Carnoy, 2005; Jacob, 2001; Marchant & Paulson, 2005; Schiller & Muller, 2000), three studies (27%) described interventions that included academic intervention components (Bishop et al., 2001; Carnoy, 2005; Marchant & Paulson, 2005), and two studies (18%) included intervention components directed at improving attendance (Bishop et al., 2001; Harris et al., 2001; Landis & Reschly, 2011). Bishop et al. (2001) was the most comprehensive included policy study and explored the effects of structural components, academic components, and attendance components. Compulsory attendance laws, state-mandated minimum course requirements, state minimum competency exams, hybrid end-of-course exam/minimum competency exam, and state standard–based reforms were examined and compared. Results were mixed and are detailed in Table 3.

Target Intervention Group Size

Interventions implemented at the state level were described in 73% of studies ($k = 8$; Bishop et al., 2001; Carnoy, 2005; Filindra et al., 2011; Jacob, 2001; Landis & Reschly, 2011; Marchant & Paulson, 2005; Schiller & Muller, 2000; Warren & Hamrock, 2010), one study (9%) described school-level interventions (Booker et al., 2010), and two (18%) described individual student level (Campbell et al., 1986; Harris et al., 2001). The majority of policy studies in this review propose state-level changes. Among included studies in this review one addressed the effects of charter school attendance at the school level (Booker et al., 2010) and two provided for individual-level supports (free educational day care: Campbell et al., 1986; and financial penalties for parents tied to student attendance: Harris et al., 2001).

Outcomes

Overall, 36% of included studies ($k = 4$) reported significant results on one or both the key outcome variables (high school dropout or school completion). Three

studies reported an increase in school completion rates (Booker et al., 2010; Campbell et al., 1986; Filindra et al., 2011; Schiller & Muller, 2000). No studies reported significant drops in high school dropout rates. Of the effective policy interventions, two focused on the effects of the broader policy context (Filindra et al., 2011; Schiller & Muller, 2000), one looked at the effects of charter schools (Booker et al., 2010), and one provided support for pregnant teens (Campbell et al., 1986).

Practice Intervention Studies

Description of Included Practice Studies

A total of 21 practice intervention studies are included in this review. Publication dates range from 1964 to 2011. Fewer than a third (i.e., 29%) of these studies ($k = 6$) used experimental designs (Catterall, 1987; Longstreth, Shanley, & Rice, 1964; Mac Iver, 2011; Sinclair, Christenson, & Evelo, 1998; Sinclair, Christenson, & Thurlow, 2005; Weis & Toolis, 2009) and 71% of studies ($k = 15$) used quasi-experimental research designs (Catterall & Stern, 1986; Franklin, Streeter, Kim, & Tripodi, 2007; Furstenberg & Neumark, 2007; Kahne, Sporte, de la Torre, & Easton, 2008; Lever et al., 2004; Levy, Perhats, Nash-Johnson, & Welter, 1992; McSparrin, 1993; Meyer, 1984; Mezuk, 2009; Nowicki, Duke, Sisney, Stricker, & Tyler, 2004; Porowski & Passa, 2011; Ramirez, Perez, Valdez, & Hall, 2009; Solomon & Liefeld, 1998; Somers & Piliawsky, 2004; Stern, Dayton, Paik, & Weisberg, 1989; Weis & Toolis, 2009). Interventions that were tested experimentally include a 4-day workshop for students in Grades 10 to 12 with a 10-week follow-up in a common advisory period (Catterall, 1987), access to vocational curriculum and after school jobs for pay and credit (Longstreth et al., 1964), monthly meetings with facilitators who helped address student problems (Mac Iver, 2011), the check and connect program (Sinclair et al., 1998; Sinclair et al., 2005) and the National Guard Challenge Program (Weis & Toolis, 2009). Study details including summaries of results are included in Table 4.

Results Reported

All studies reported descriptive statistics, and all but one study (Levy et al., 1992) also reported inferential statistics. In addition, one study used visual analysis (Porowski & Passa, 2011), and four studies reported effect sizes (Furstenberg & Neumark, 2007; Kahne et al., 2008, Porowski & Passa, 2011, Sinclair et al., 2005). Results are reported specifically by participant race in three studies (Levy et al., 1992; Mezuk, 2009; Sinclair et al., 2005), by gender in five studies (Catterall, 1987; Furstenberg & Neumark, 2007; Mac Iver, 2011; Sinclair et al., 2005; Weis & Toolis, 2009), and by special education status in two studies (Sinclair et al., 1998; Sinclair et al., 2005).

In addition to dropout rate or school completion measures, one study (Catterall, 1987) reported behavioral, academic and attendance outcomes; four studies (Franklin et al., 2007; Kahne et al., 2008; McSparrin, 1993; Sinclair et al., 1998) reported academic and attendance outcomes. Five studies reported behavioral outcomes (Lever et al., 2004; Longstreth et al., 1964; Nowicki et al., 2004; Somers & Piliawsky, 2004; Weis & Toolis, 2009), five reported other academic outcomes (Meyer, 1984; Mezuk, 2009; Porowski & Passa, 2011; Ramirez et al., 2009;

Somers & Piliawsky, 2004), and four reported attendance outcomes (Furstenberg & Neumark, 2007; Mac Iver, 2011; Sinclair et al., 1998; Stern et al., 1989).

Intervention Components

Multicomponent interventions that included behavioral, academic, attendance, and study skill interventions were described in 24% of studies (k = 5, Catterall, 1987; Furstenberg & Neumark, 2007; Lever et al., 2004; Nowicki et al., 2004; Porowski & Passa, 2011). Interventions with academic and behavioral components were described in 10% of studies (k = 2, Franklin et al., 2007; Levy et al., 1992). Interventions with a behavioral and attendance component were found in 14% of studies (k = 3, Mac Iver, 2011; Sinclair et al., 1998, Sinclair et al., 2005). Interventions that included just an academic component comprise 29% of studies (k = 6; Catterall & Stern, 1986; Meyer, 1984; Mezuk, 2009; Ramirez et al., 2009; Somers & Piliawsky, 2004; Stern et al., 1989). Behavioral intervention components alone were found in only one study (Weis & Toolis, 2009), and one study included an attendance intervention alone (McSparrin, 1993). In addition to the above intervention components, school structure or organizational characteristics were addressed in 48% of interventions (k = 10; Catterall, 1987; Catterall & Stern, 1986; Franklin et al., 2007; Kahne et al., 2008; Lever et al., 2004; Levy et al., 1992; Longstreth et al., 1964; Nowicki et al., 2004; Porowski & Passa, 2011; Stern et al., 1989).

Target Intervention Group Size

Only one included (5%) study (Porowski & Passa, 2011) described a tiered intervention designed to offer differentiated levels of support based on student or school needs. School-level interventions were described in two studies (10%; Franklin et al., 2007; Kahne et al., 2008). Seven studies (33%) described intervention practices that were implemented with both individual students and small groups (Catterall, 1987; Furstenberg & Neumark, 2007; Levy et al., 1992; Longstreth et al., 1964; McSparrin, 1993; Mezuk, 2009; Weis & Toolis, 2009). Individual interventions were described in six studies (29%; Lever et al., 2004; Mac Iver, 2011; Sinclair et al., 1998; Sinclair et al., 2005; Somers & Piliawsky, 2004), and interventions targeting small groups were described in five studies (24%; Catterall & Stern, 1986; Meyer, 1984; Nowicki et al., 2004; Ramirez et al., 2009; Stern et al., 1989).

Outcomes

Statistically significant positive results were reported in 52% of studies (k = 11) on one or both of the key outcome variables (high school dropout or school completion rates). Seven studies (33%) reported significant decreases in both dropout rates and increases in school completion rates (Furstenberg & Neumark, 2007; Meyer, 1984; Mezuk, 2009; Porowski & Passa, 2011; Sinclair et al., 2005; Solomon & Liefeld, 1998; Stern et al., 1989), three studies (14%) reported significant increases in school completion rates (Nowicki et al., 2004; Ramirez et al., 2009; Weis & Toolis, 2009), and one study (5%) reported significant decreases in dropout rates (Sinclair et al., 1998). An additional five studies (24%) reported improvements in either dropout rates or school completion rates but did not report

statistical tests of these results (Kahne et al., 2008; Lever et al., 2004; Levy et al., 1992; Mac Iver, 2011; Somers & Piliawsky, 2004). To ensure a comprehensive report of effective interventions, these studies are included in the following summary of studies with positive results. Overall, 76% (k = 16) of included practice intervention studies reported improvement in either high school dropout rates or school completion rates.

Summary of Effective Interventions

Overall, 76% of included practice interventions reported significant or marginally significant improvements in high school dropout rates or school completion rates. Only 36% of policy studies reported significant positive effects on either high school dropout rates or school completion rates. To better understand the common components of effective dropout prevention or school completion efforts, intervention descriptions and key findings and implications from the 20 (63%) studies (4 policy and 16 practice studies) with positive results are summarized in the this section. Two articles (Sinclair et al., 1998; Sinclair et al., 2005) describe different studies using the same intervention.

Intervention Components of Effective Studies

Multicomponent intervention approaches were reported in nine (45%) of the effective studies, meaning the intervention incorporated at least two of the following interventions: (a) academic strategies, (b) behavioral strategies, (c) attendance strategies, (d) study skill strategies, or (e) school organizational or structural changes. The FUTURES program described by Lever et al. (2004) incorporates all five of these components into a comprehensive 5-year program. Students receive ongoing support that begins as they transition from middle school to high school. Support includes academic tutoring, social skills instruction and character development, leadership training, work experience, incentives for attendance, smaller class sizes, and access to mental health support. Two programs incorporated four intervention components. The Educational Encouragement Programs described by Furstenberg and Neumark (2007) are a loose cluster of programs that vary in comprehensiveness and intensity, making it difficult to determine the actual level or type of services provided to students. Unlike that study, the Effective Learning Program described by Nowicki et al. (2004) is a well-defined intervention program that offers high school students smaller class sizes, social skills instruction that target both student-to-student relationships and student-to-teacher relationships, individualized academic instruction, and incentives for attendance. The Children and Adolescent Pregnancy Project (Levy et al., 1992) incorporated three intervention components. Pregnant teens were served through a self-contained school and provided academic and behavioral as well as medical support until their babies were born. Teens were then transitioned back to their home schools with 18 months of follow-up support from the project.

Behavioral interventions and attendance interventions were combined in two described interventions (Mac Iver, 2011; Sinclair et al., 1998; Sinclair et al., 2005) that used adult facilitators to monitor student risk factors and provide needed supports. The National Guard Challenge Program combined academic support and

behavioral support (Weis & Toolis, 2009). Students attended this program away from their home schools; however, this intervention was not considered a school-level intervention because there was not follow-up support offered or changes made to students home schools following the intervention. Academies, or "schools within schools," evaluated by Stern et al. (1989) combine academic and school structural changes (smaller class sizes, changes in courses offered, partnerships with local employers).

Eight effective interventions (40%) incorporated only one intervention component. Academic strategies were used in four studies (Meyer, 1984; Mezuk, 2009; Ramirez et al., 2009; Somers & Piliawsky, 2004) and school-level or organizational changes (charter schools, smaller high schools, state-level school, and student accountability) were used in four studies (Booker et al., 2010; Kahne et al., 2008; Porowski & Passa, 2011; Schiller & Muller, 2000).

Three studies (15%) described intervention components that did not fit these categories. Of these interventions, two included support for pregnant teens through the provisions of free child care (Campbell et al., 1986) or medical support (Solomon & Liefeld, 1998). The final included study reported the relationship between political climate or policy context and dropout rates (Filindra et al., 2011).

Age of Students at Intervention Impact

Most ($k = 14$, 70%) studies reported evaluations for interventions implemented at the high school level (Booker et al., 2010; Campbell et al., 1986; Filindra et al., 2011; Kahne et al., 2008; Mac Iver, 2011; Mezuk, 2009; Nowicki et al., 2004; Porowski & Passa, 2011; Schiller & Muller, 2000; Sinclair et al., 2005; Solomon & Liefeld, 1998; Somers & Piliawsky, 2004; Stern et al., 1989; Weis & Toolis, 2009). Interventions that were implemented in middle school or during the transition from eighth to ninth grade were reported in 20% of studies ($k = 4$; Furstenberg & Neumark, 2007; Lever et al., 2004; Levy et al., 1992; Sinclair et al., 1998), and interventions implemented at the elementary level were reported in 10% of studies ($k = 2$, Meyer, 1984; Ramirez et al., 2009)

Target Intervention Group Size for Effective Studies

Only 5% of studies ($k = 1$; Porowski & Passa, 2011) described a tiered intervention approach the incorporated the use of data to deliver individual-, group-, and school-level interventions based on needs. An additional 25% ($k = 5$; Furstenberg & Neumark, 2007; Lever et al., 2004; Levy et al., 1992; Mezuk, 2009; Weis & Toolis, 2009) described interventions that incorporated both the individuals and small groups components. Six individual interventions were described in seven (35%) studies (Campbell et al., 1986; Mac Iver, 2011; Sinclair et al., 1998; Sinclair et al., 2005; Solomon & Liefeld, 1998; Somers & Piliawsky, 2004) and four studies (20%) described small group interventions (Meyer, 1984; Nowicki et al., 2004; Ramirez et al., 2009; Stern et al., 1989). Only two studies describe school-level interventions (Booker et al., 2010; Kahne et al., 2008) and two (10%) describe state-level interventions (Filindra et al., 2011; Schiller & Muller, 2000). Overall, 79% ($k = 15$) of included studies described as interventions that were targeted at individual students or small groups.

Ineffective Interventions

It is also important to note policies or practices that did not work or made things worse. Three included studies provided some evidence that high school exit exams are associated with higher dropout rates, especially for students in lower income quartiles or who are already at risk because of nonacademic factors (Bishop et al., 2001; Jacob, 2001; Marchant & Paulson, 2005). Three other interventions appeared to be related to increased dropout rates (Catterall, 1987; Franklin et al., 2007; McSparrin, 1993). These results were attributed to either isolating high-risk students within high schools (Catterall, 1987) or substantial preintervention differences between treatment and control groups (Franklin et al., 2007; McSparrin, 1993). Six interventions had mixed results or no effects (Carnoy, 2005; Catterall & Stern, 1986; Harris et al., 2001; Landis & Reschly, 2011; Longstreth et al., 1964; Warren & Hamrock, 2010).

Discussion

This systematic review addressed two main questions related to (a) the characteristics of the empirical literature examining high school dropout or school completion interventions and (b) the common elements of effective policy or practice interventions for reducing high school dropout rates or increasing school completion rates.

In general, results from this review indicate a gap between what is known about dropout risk factors and the recommendations made by experts and the focus of experimental research on dropout interventions. This review focused on peer-reviewed empirical literature to highlight the need for further high-quality research in this area. The vast majority of research in the area of high school dropout prevention has been focused on either identifying risk factors for students likely to dropout or conducting intensive student-level interventions (Dynarski & Gleason, 2002; Mann, 1986; Prevatt & Kelly, 2003; Rumberger, 1995). However, for many students who choose to leave high school, this decision comes at the end of a long process of disengagement from school (Jimerson, Egeland, Sroufe, & Carlson, 2000; Rumberger & Rotermund, 2012). Additionally, the impact of individual risk factors may change across time (Goldschmidt & Wang, 1999). It may be more accurate to consider students who drop out as members of distinct subgroups rather than as one group (Bowers & Sprott, 2012a, 2012b). These subgroups may represent groups of students for whom different interventions may be more or less effective. Although this review does describe intervention components of effective studies, none of the intervention studies included in this review disaggregated effects based on subgroups of dropouts. Therefore, although theoretically, intervention components should be matched with subgroup needs, no conclusions can be drawn from the intervention literature in this review about the effects of different intervention components on subgroups of high school dropouts. Students who are at risk for dropping out can be identified as early as elementary school (Balfanz et al., 2007; Carnahan, 1994; Catterall, 1987), and schools that are able to keep students engaged early on may reduce their need for high-intensity interventions later on (Bryk & Thum, 1989; Coie, Lochman, Terry, & Hyman, 1992).

Given these facts, a systematic, tiered, preventative approach to reducing the high school dropout rate has been recommended by researchers (Mac Iver & Mac

Iver, 2010). However, this approach has not yet been adequately studied. Researchers have suggested that school-level tiered interventions may increase a school's capacity to address intensive student needs, and researchers have begun to conceptualize the dropout problem as a system-level failure in need of a systemic tiered intervention (Lee & Burkam, 2003; Lehr et al., 2003; Mac Iver, 2011), however as this review shows, the current body of empirical research provides little guidance to schools or policy makers with respect to either matching dropout interventions with particular risk factors or subgroups or integrating dropout interventions into a multitiered framework that may address student needs more effectively and efficiently (Dynarski et al., 2008; MacIver, 2010; Wehlage, Rutter, Smith, Lesko, & Fernandez, 1989).

Characteristics of the Empirical Literature

As others have reported (Lehr et al., 2003; Prevatt & Kelly, 2003), much of research on dropout or school completion interventions is based on nonexperimental designs. We limited the included studies for this review to experimental or quasi-experimental studies to highlight the need for further empirical work in this area. Given these criteria, we screened 1,519 dropout or school completion–related abstracts, passed only 104 articles to full article screening, and retained only 32 of those after the full review. The high volume of screened studies that were not included in this review is one indication of the lack of experimental intervention research available on this topic. Even in this review, only 25% of the included studies were true experimental designs. Given the substantial amount of federal, state, and school money spent on dropout prevention interventions and the serious personal and social costs of high school dropout, this lack of solid empirical studies to guide policy and practice is unacceptable. Only 36% of the policy studies included in this review reported statistically significant positive effects on either high school dropout rates or school completion rates. Three studies (27%) addressed high school exit exams and found negative effects of exams on graduation rates. Policy studies were more likely to include school structure or organization intervention components (53%) than academic, behavioral, or attendance components. There were also far more likely to be implemented at the state level (73%) rather than at a district or school level.

As expected, practice intervention studies were far more likely (85% of studies) to be implemented with individual students or small groups. Despite the fact that research about dropout risk factors indicated that most students who dropout were at risk in multiple ways (Lan & Lanthier, 2003; Lee & Burkam, 2003; Neild, 2009; Neild et al., 2008; Roderick & Camburn, 1999; Suh & Suh, 2007), only 48% of studies included multiple intervention components to address multiple risk factors. This may be a function of researcher's attempts to simplify research questions in order to identify causal links between the intervention and improved graduation outcomes; however, the result is an empirical literature base that does not provide much guidance for practitioners looking to align practices with the needs of students in their schools. Current research on the varied subgroups of high school dropouts has promising implications for practice, but researchers must first take the next step and link subgroup characteristics with effective intervention components.

There is a surprising lack of emphasis in the intervention literature on developing interventions that address larger community characteristics such as poverty or the effects of race. Often in education research, these variables are controlled for in statistical models and considered inalterable (e.g., Ekstrom, Goertz, Pollack, & Rock, 1986; Gleason & Dynarski, 2002: Rumberger, 2011; Wehlage & Rutter, 1986). However, the significance of these variables on high school dropout outcomes should not be simply controlled for. Community and family factors such as poverty have real and significant effects on students' ability to succeed in and complete school. Intervention research must go beyond the typical school boundaries to mediate these factors. This type of outreach cannot be accomplished by schools alone and will require significant, meaningful, and effective partnerships with community agencies, community mental health supports, and other public health initiatives (Bryan, 2005; Schorr, 1997).

Common Components of Effective Interventions

Multicomponent intervention practices were reported in 45% of studies with positive results. Among single-component interventions, the only effective components were academic interventions or school-level organizational components. The majority (79%) of effective studies were targeted at individual students or small groups, and 70% of studies targeted students in high school. Although indications are clearly positive, early identification of risk factors and early intervention as well as systemic school-level interventions appear to be relatively untested recommendations in the empirical literature. Again this may be because of the fact that testing complex multifaceted early intervention systems to determine effectiveness on distal outcome variables such as high school dropout or school completion rates is difficult and expensive, whereas testing individual components on shorter term objectives is significantly more practical. Nonetheless, there is a clear need for research that explores multicomponent packages as well as early identification and intervention.

Researchers have also called for a multitiered systemic approach that addresses school-level problems as well as provides individual and small group interventions (Lee & Burkam, 2003; Lehr et al., 2003, Mac Iver, 2011); however, little experimental research has been conducted on this approach. Only one study included in this review described a schoolwide, tiered intervention model. This may be related to the fact that it is often easier for researchers to test individual components than multitiered frameworks of support.

Schools are being asked to implement evidence-based practices integrated through multitiered systems of support to address student academic and behavioral concerns (Mac Iver, 2011); however, there is little discussion or guidance from researchers about how to best integrate knowledge of dropout risk factors or interventions into this framework. For schools to successfully follow these recommendations, guidance on the design and implementation of integrated multitired systems of support (i.e., one that addresses academics, attendance, behavior, and dropout) is needed. Additionally, although researchers suggest the importance of considering specific characteristics and needs of individual students or groups and the impact of the overall school context, additional guidance is required for creating systems that effectively meet these needs.

Schools, especially challenged schools, are often trying to implement multiple interventions, programs, or initiatives at the same time (Fullan, 1995). These initiatives may address academic performance, school climate, school completion, college and career readiness, or other outcomes and are often perceived as being competing efforts (Flannery, Sugai, & Anderson, 2009; Hatch, 2001; Malen & Rice, 2004). Understanding how academics, behavior, attendance, and school dropout are related and thinking of each of these groups as indicators that can be influenced by the overall school context may lead to a more constructive integration of school improvement initiatives at the school, district, state, and federal levels. However, the current research base comprisinge primarily state-level or intensive student-level interventions (often not implemented until high school) is unable to inform practice decisions for school and states looking for a more proactive and efficient approach to addressing high school dropout.

Additionally, schools and communities must work together to ensure that school activities, curriculum, and interventions are implemented in a culturally and contextually relevant way (Sugai, O'Keeffe, & Fallon, 2012). Significant gaps still exist between racial or ethnic groups in dropout rates (U.S. Department of Education, National Center for Education Statistics, 2012), and schools must ensure that the needs of an increasingly diverse student population are effectively met. Addressing and describing the effects of poverty and race on students cannot be accomplished within the education system without meaningful effective partnerships that extend into the community and public health system. However, different policymaking bodies often govern these systems, and barriers on both sides may prevent schools and community agencies from sharing needed information and working together effectively (Anderson-Butcher et al., 2008). Policymakers must be aware of these issues and work to encourage effective partnerships.

Although 20 studies included in this review did report results that were disaggregated by race, gender, socioeconomic status, or Individualized Education Plan status, the current body of empirical research in the area of high school dropout interventions does little to inform adaptation of interventions in order to ensure contextual and cultural fit and effectiveness. Given the significant differences in outcomes across racial and socioeconomic indicators, schools may need support and guidance to identify contextually or culturally appropriate practices that fit within a preventative intervention framework.

Limitations

There are several limitations to this review. First, it is possible that studies that fit the inclusion criteria were missed during both the electronic database search and the ancestral search. The ancestral search increases the likelihood that relevant studies were identified; however, it does not guarantee this. Second, studies were deemed to be effective based on the criteria that they reported (a) statistically significant ($p < .05$) or marginally significant ($p < .1$) results or (b) in the absence of statistical tests, descriptive statistics that indicated improvement for either high school graduation rates or school completion rates. These criteria were intentionally loose to provide a broader base of studies from which to draw conclusions; however, there is no indication that these interventions actually produced socially significant results at the student or school level. Finally, although

studies were included in this review based on either experimental or quasi-experimental research designs, the quality of the research is variable and causal conclusions should not be drawn from this review.

Recommendations and Conclusion

Findings from this review have implications for school leaders, researchers, and policymakers. First, caution should be used when making decisions about dropout intervention programs, even when those programs align with current best practice recommendations, because currently there is little empirical evidence to support these recommendations. Second, despite the gap in available research, evidence does support the use of multicomponent interventions, early intervention, and strategies that address the school organizational structure. Dropout prevention programs that align with these strategies may be effective; however, further guidance is needed to guide schools and policymakers in the integration of these practices in the most efficient and effective manner. Finally, given the magnitude of school reforms currently underway targeting this issue, researchers and funders need to tackle the complexity of the dropout problem and conduct research that either confirms or denies current best practice recommendations with particular attention to the integration of practices into multitiered systems of support that address student needs proactively and effectively.

In conclusion, this review provides a synthesis of research focused on policy and practice interventions for addressing the dropout problem. Findings indicate that despite research indicating the need to address multiple risk factors and the need for early intervention, the bulk of current empirical research is focused on single-component, individual, or small group interventions. This review extends the current literature by reviewing both policy and practice interventions and focusing on experimental and quasi-experimental research designs and examining how common components for effective interventions relate to current expert recommendations.

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