Comprehensive Teacher Induction: Year 1 Impact Findings From an RCT

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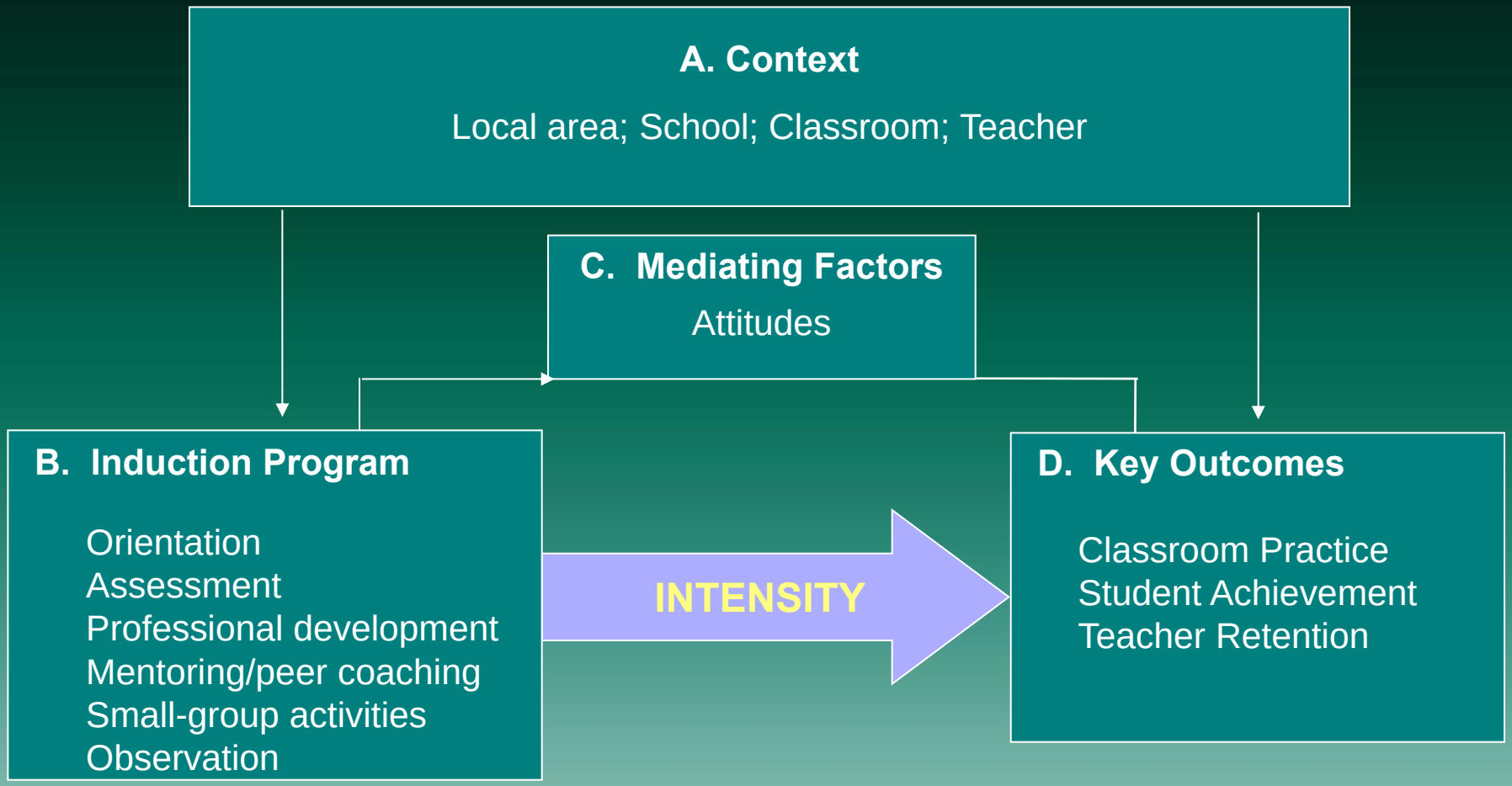
Outline of Presentation

- Motivation
- Study design
- The treatment
- Impacts on key outcomes

The Challenge

- 40-50% of teachers leave within the first 5 years (Murnane et al 1991; Ingersoll and Smith 2003)
- 16% of teachers in Texas left after 1 year; 26% after 2 years (Kirby, Berends, and Naftel 1999)
- More "qualified" teachers have higher rates of turnover (Lankford et al. 2002)
- New teachers produce lower gains in student achievement (Rivkin et al. 2001)
- High rates of turnover expose more students to inexperienced teachers

Conceptual Framework



Sample Selection

- Districts (17): size, poverty, need for induction, willingness to participate
- Elementary schools (418): had eligible teacher(s)
- Teachers (1,009): new to profession, in self-contained classrooms, not in supported programs

Study Design

- Random assignment of schools within districts
- Treatment group received comprehensive support, while control group received "business-as-usual" support
- Comparisons between teachers in the same district, grade
- Hierarchical modeling
- Effects aggregated across districts, grades
- Longitudinal data collection: Through fall 2008

Treatment Provision

- Competitive selection of two service providers
  - Educational Testing Service
  - New Teacher Center at UC-Santa Cruz
- Service provision during 2005-2006
- Implementation monitored by WestEd

Comprehensive Induction Support

ETS and NTC provided similar services:

- Carefully selected and trained mentors
- Yearlong curriculum with focus on professional practice
- Weekly meetings with full-time mentors (12:1 ratio)
- Observations of practice
- Monthly professional development
- Monthly study groups (ETS only)
- Program infrastructure

Primary Research Questions

What are the impacts on …

1. Induction service receipt?
2. Teacher attitudes?
3. Classroom practices?
4. Student achievement?
5. Teacher retention?
6. Composition of the teaching force?

Summary of First Year Findings

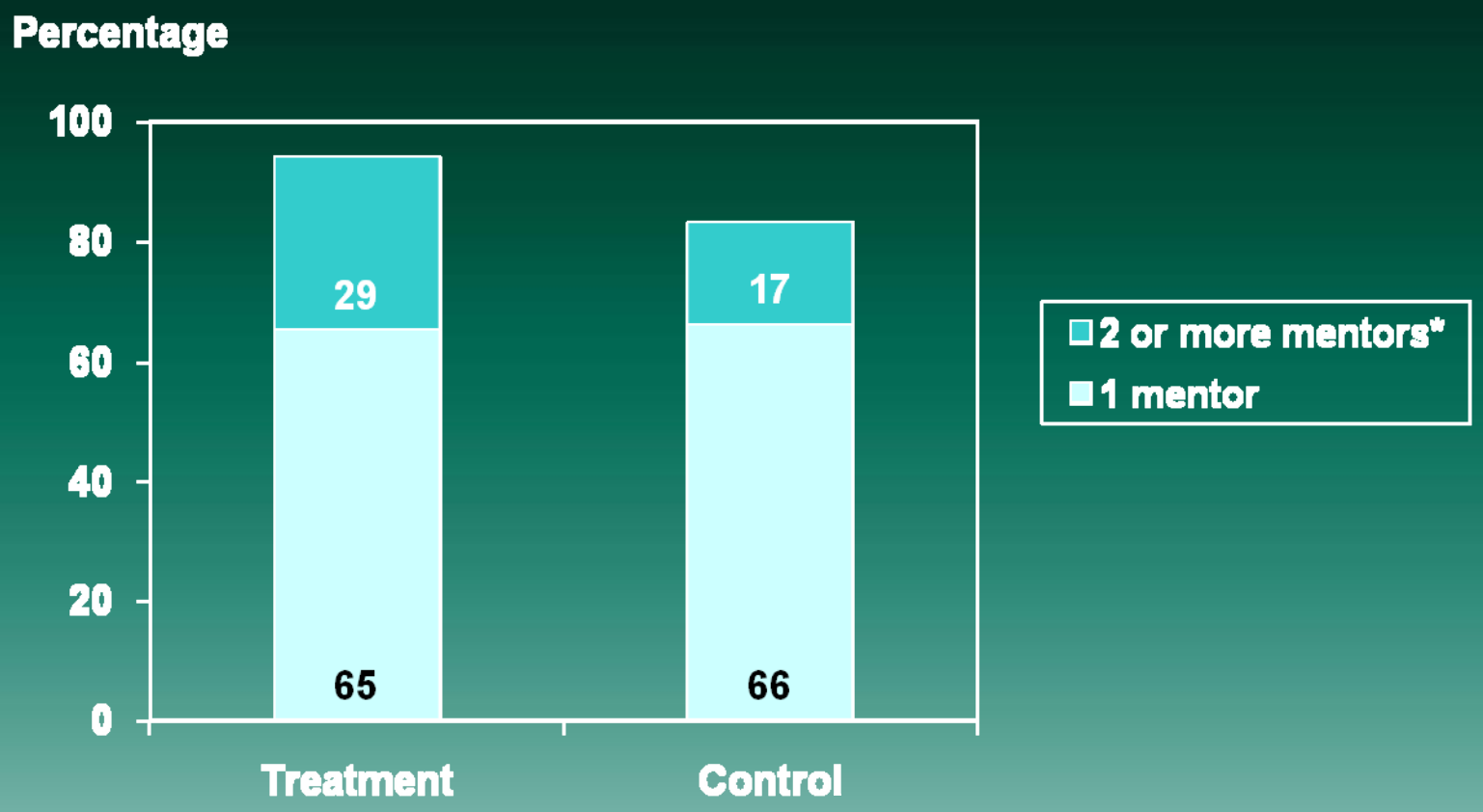
- Control group received support…
  …but treatment group received more

- No positive impact on teacher attitudes
- No impact on classroom practices
- No positive impact on test scores
- No impact on teacher retention
- No positive impact on composition of teacher workforce

Research Question #1

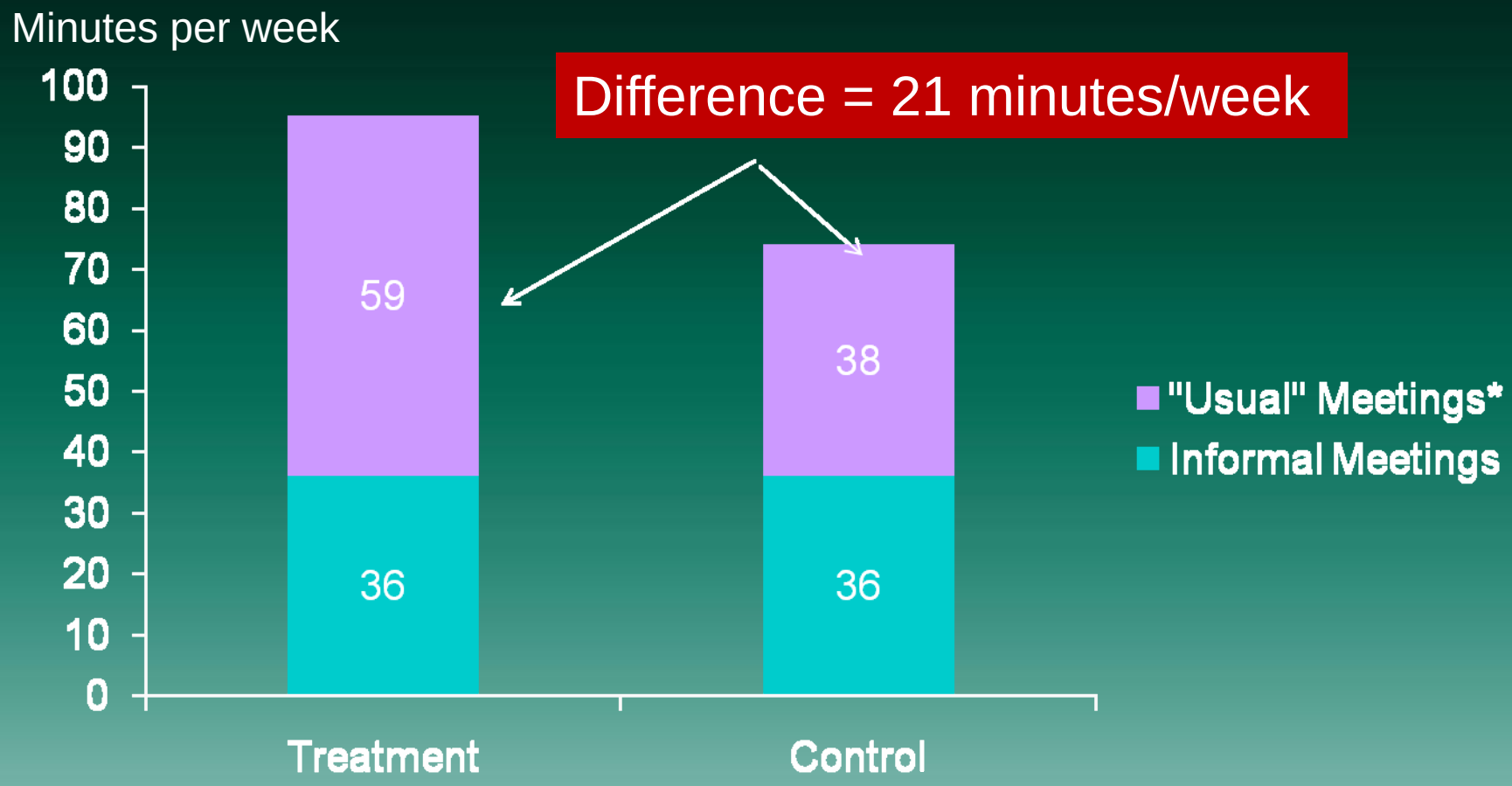
What Is the Impact on Induction Service Receipt?

Treatment Teachers Were More Likely to Have a Mentor



* Significantly different from zero at the 0.05 level, two-tailed test (N = 897 teachers)

Treatment Teachers Spent More Scheduled Time With Mentors



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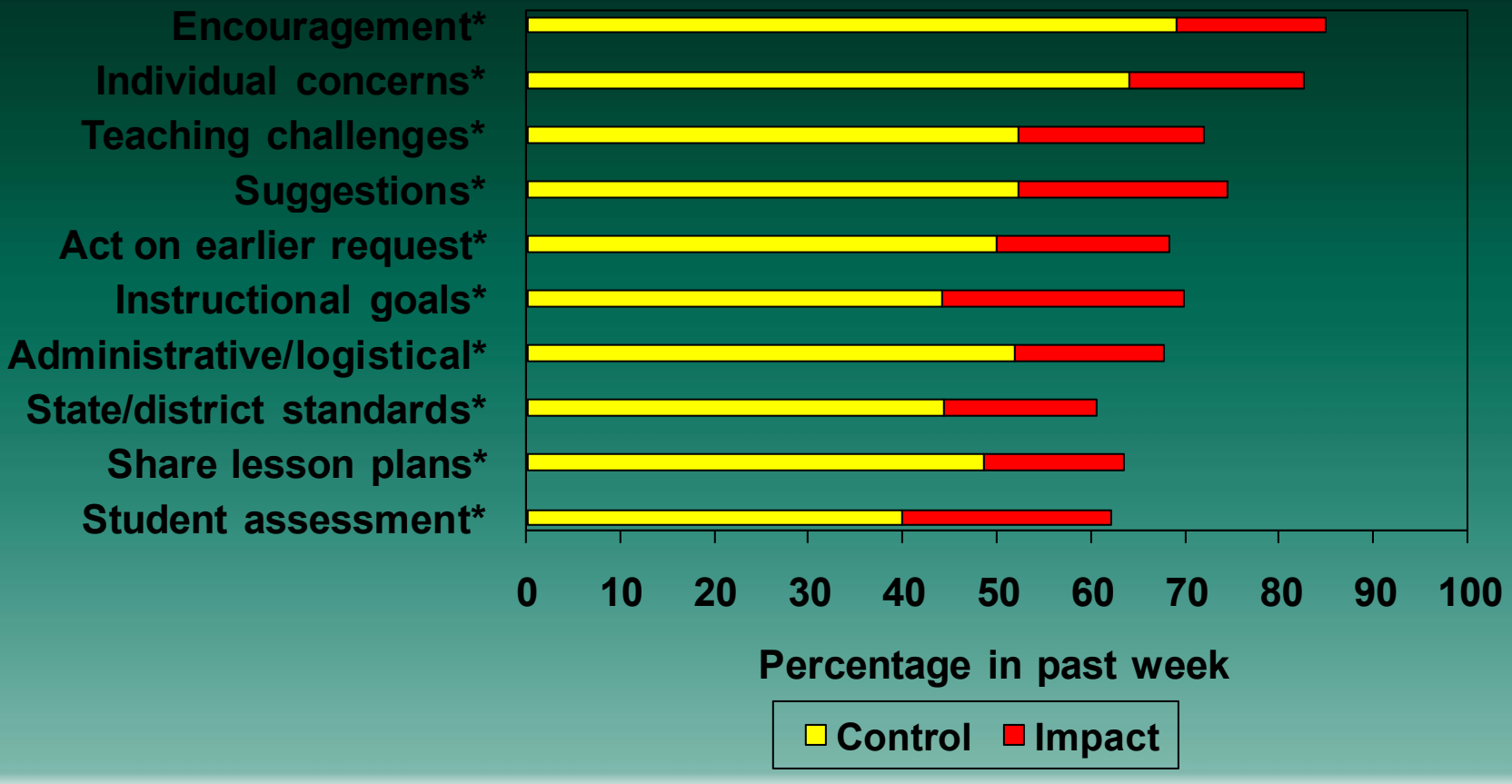
More Treatment Teachers Received Guidance From Mentors in Past Week



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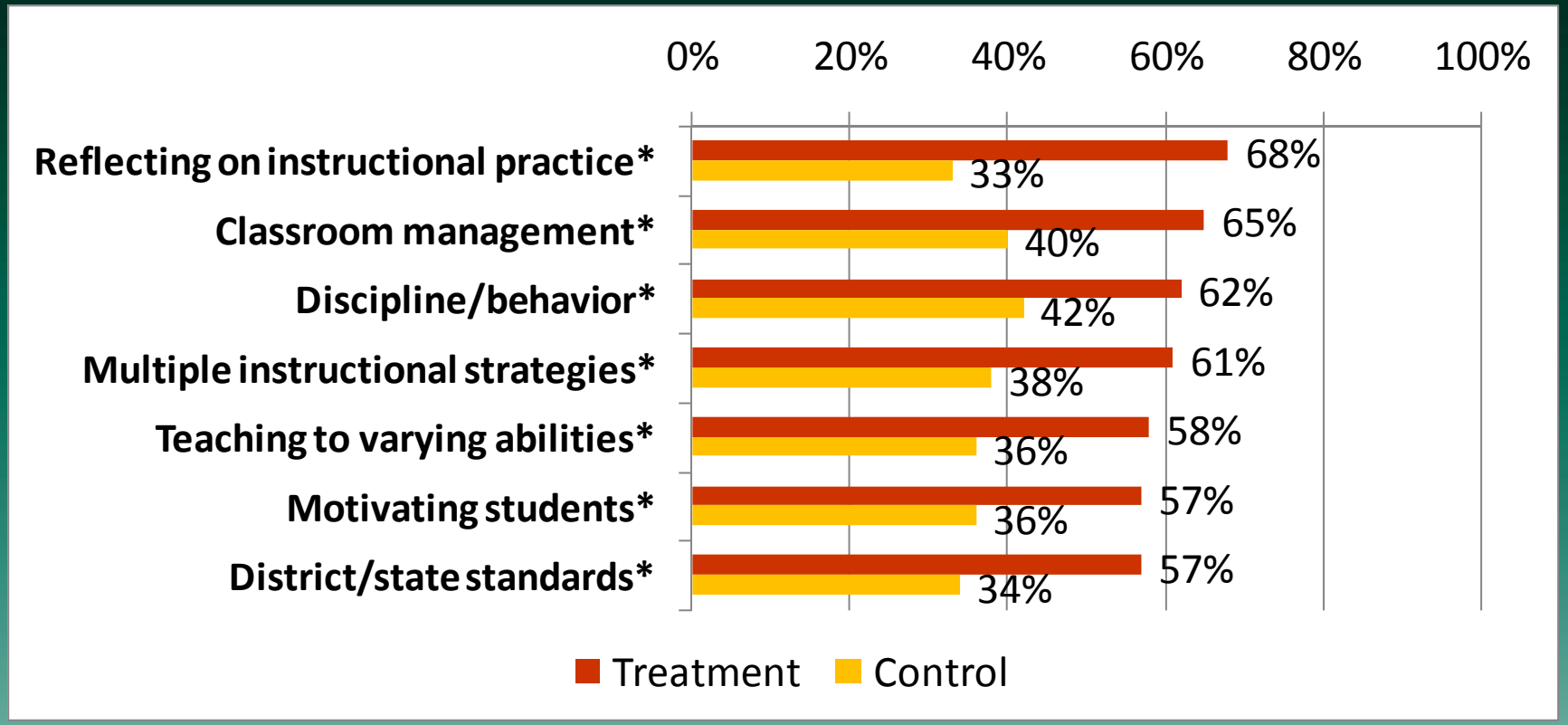
…and Past 3 Months



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Other Areas with Significant T-C Support Differences

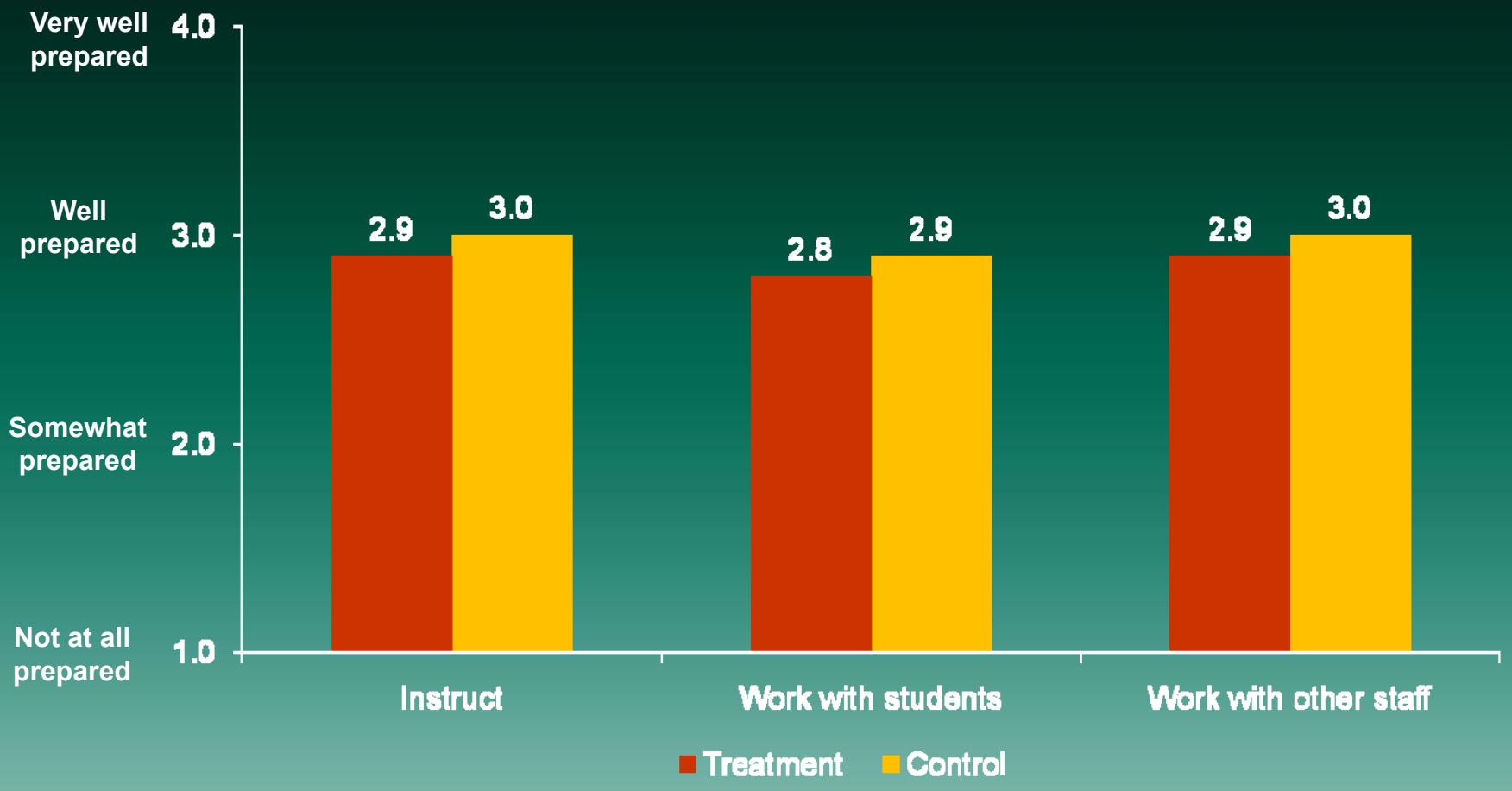
Treatment teachers:

- Engaged in more PD:
  - Worked with a study group
  - Observed others teaching
  - Kept a written log
- Were observed by mentor more frequently
- Were more frequently given feedback

Research Question #2

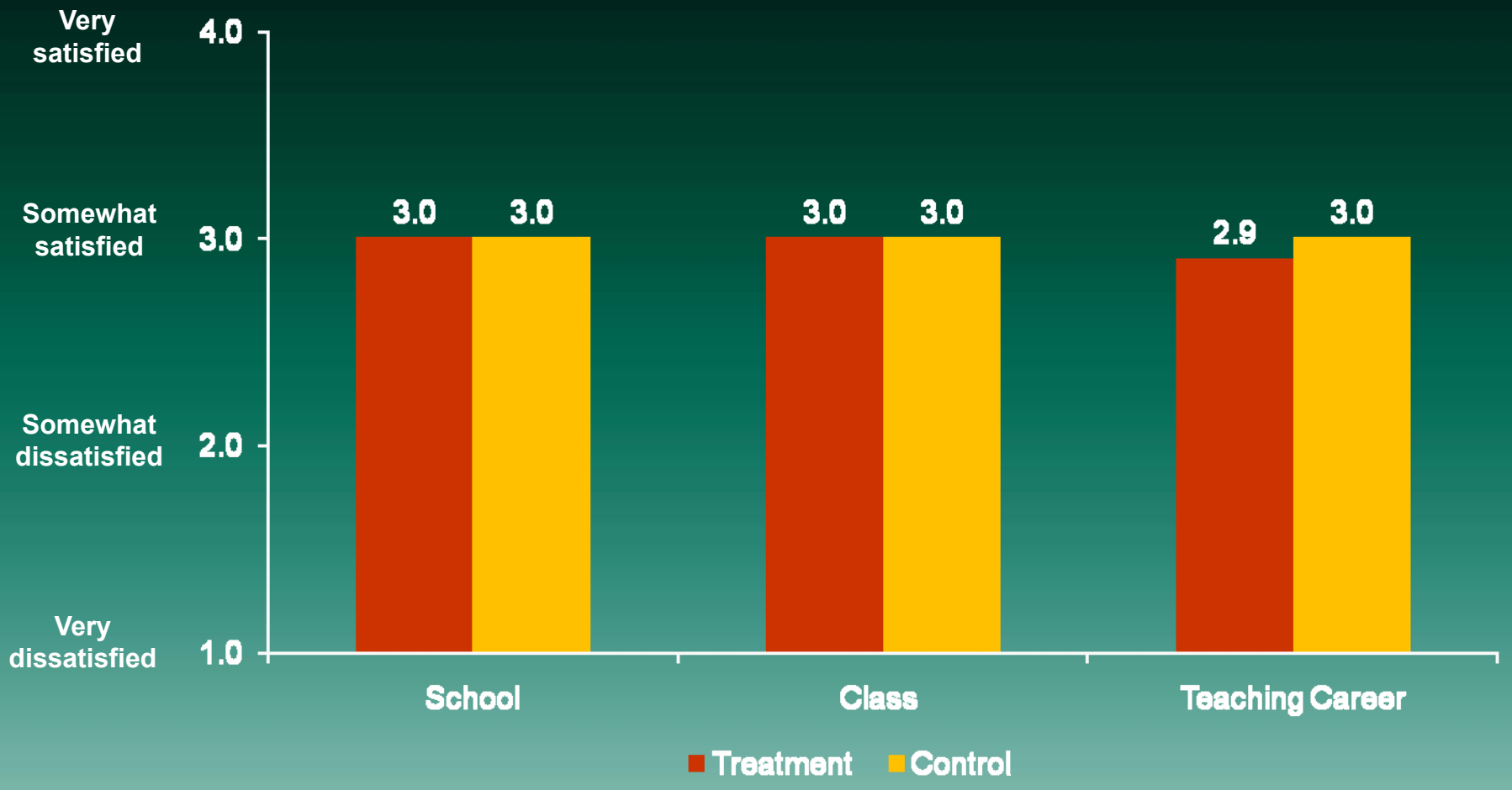
What Is the Impact on Teacher Attitudes?

No Impact on Teacher Preparation



Treatment-control differences are not statistically significant after applying the Benjamini-Hochberg correction for multiple comparisons.

No Impact on Teacher Satisfaction



Treatment-control differences are not statistically significant after applying the Benjamini-Hochberg correction for multiple comparisons.

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Research Question #3

What Is the Impact on Classroom Practices?

Observation of Classroom Practices in Reading and Literacy

- Observed literacy unit, 1-2 hours
- 698 eligible teachers excludes those:
  - Teaching special populations; math only; not first-year teachers in district
- Practice rated using VCOT
  - Focus on lesson implementation; content; classroom culture
  - Five point scale: "No" to "Extensive" evidence

No Impact on "Evidence of Effective Teaching Practice"

Treatment-control differences are not statistically significant (N = 631 teachers).

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Research Question #4

What Is the Impact on Student Achievement?

Student Test Score Data

- Collected scores on district-administered standardized tests for students of study teachers
  - Spring 2006 (posttest)
  - Spring 2005 scores for same students (pretest)
- Math (n=261 teachers) and reading (n=281 teachers)
  - Excluded non-tested grades; no T-C overlap in grade; no pretest; 1 district without matched teacher-student data
- Standardized test scores to z-scores; T-C comparisons within grade and district

No Positive Impacts on Reading

Grade	Impact (E.S.)	P-value	#Students	#Teachers
2 Reading	-0.22*	0.034	543	42
3 Reading	-0.13	0.119	1,113	75
4 Reading	0.04	0.421	1,679	108
5 Reading	0.01	0.843	1,516	81
All Grades, Reading	**0.01**	**0.735**	**4,899**	**283**

* Significantly different from zero at the 0.05 level, two-tailed test .

…or Math

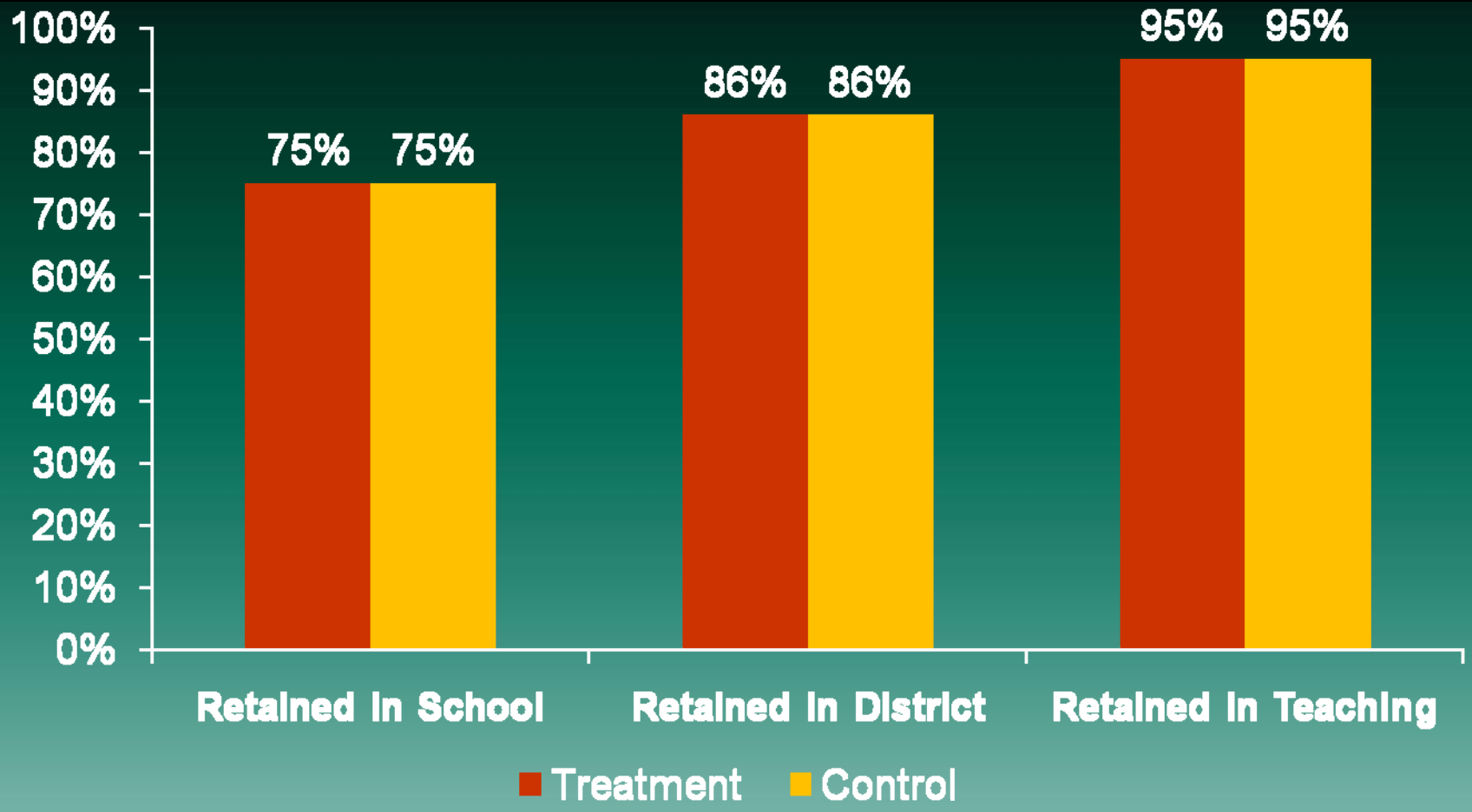
Grade	Impact (E.S.)	P-value	#Students	#Teachers
2 Math	-0.38*	0.000	472	35
3 Math	-0.26*	0.002	837	65
4 Math	0.03	0.617	1,545	99
5 Math	-0.04	0.549	1,510	81
All Grades, Math	**-0.05**	**0.184**	**4,412**	**261**

* Significantly different from zero at the 0.05 level, two-tailed test .

Research Questions #5 and #6

What are the Impacts on Teacher Retention and Composition of Teaching Workforce?

No Impact on Teacher Retention



Treatment-control differences are not statistically significant (N = 882 Teachers).

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No Positive "Composition" Impacts

- Even if retention rates are equal, did the treatment and control groups retain different types of teachers? No.

  Comparing treatment stayers vs. control stayers on:
  - Qualifications: no difference
  - Classroom practices: no difference
  - Test scores: impact = –0.08

Correlational Analysis

- If you disregard treatment status, is more induction correlated with better outcomes?
- Capture types, purpose, duration and intensity:
  - Classroom practices – 22 measures
  - Test scores – 22 measures
  - Retention – 24 measures
- Conclusions: Proceed with caution

Correlation Between Induction Measures and Key Outcomes

- Classroom practices – 0 significant
- Test scores – 3 significant (positive)
- Retention – 8 significant (positive)

Future Reports

- Split into 2 experiments in Year 2: treatment schools in 7 districts received second year of induction services
- Report separately by 1- and 2-year districts
- Year 2 and year 3 reports on service receipt, student achievement, teacher retention

Extra Slides

Research on Induction

- Teachers getting induction support less likely to leave teaching (Smith and Ingersoll 2004)
- Teachers leaving MA public schools felt support inadequate (Johnson and Birkeland 2003)
- Mentoring has positive effect on retention (review of 10 studies; Ingersoll and Kralik 2004)
- Mentor experience within a school improves retention (Rockoff 2008)
- Districts with intensive mentoring have higher student achievement (Fletcher, Strong, and Villar 2006)
- Students of teachers highly engaged in BTSA perform better (Thompson et al. 2004)

Recruitment of Mentors

The 44 selected mentors were:

- Predominantly female (95%)
- Racially diverse (51% white)
- Well-educated (86% had master's degree)
- Certified in elementary education (91%)
- Recent classroom teachers (82% taught in previous school year)
- Experienced teachers (18 years, on average)
- Prior mentors (77%)

Curricular Framework

ETS: Framework for Teaching (Danielson)

1. Planning and preparation
2. Classroom environment
3. INSTRUCTION
4. Professional responsibilities

NTC: Professional Teaching Standards (CA)

1. Planning instruction
2. Effective environments
3. Subject matter
4. Professional responsibilities
5. Engaging all students
6. Assessing student learning

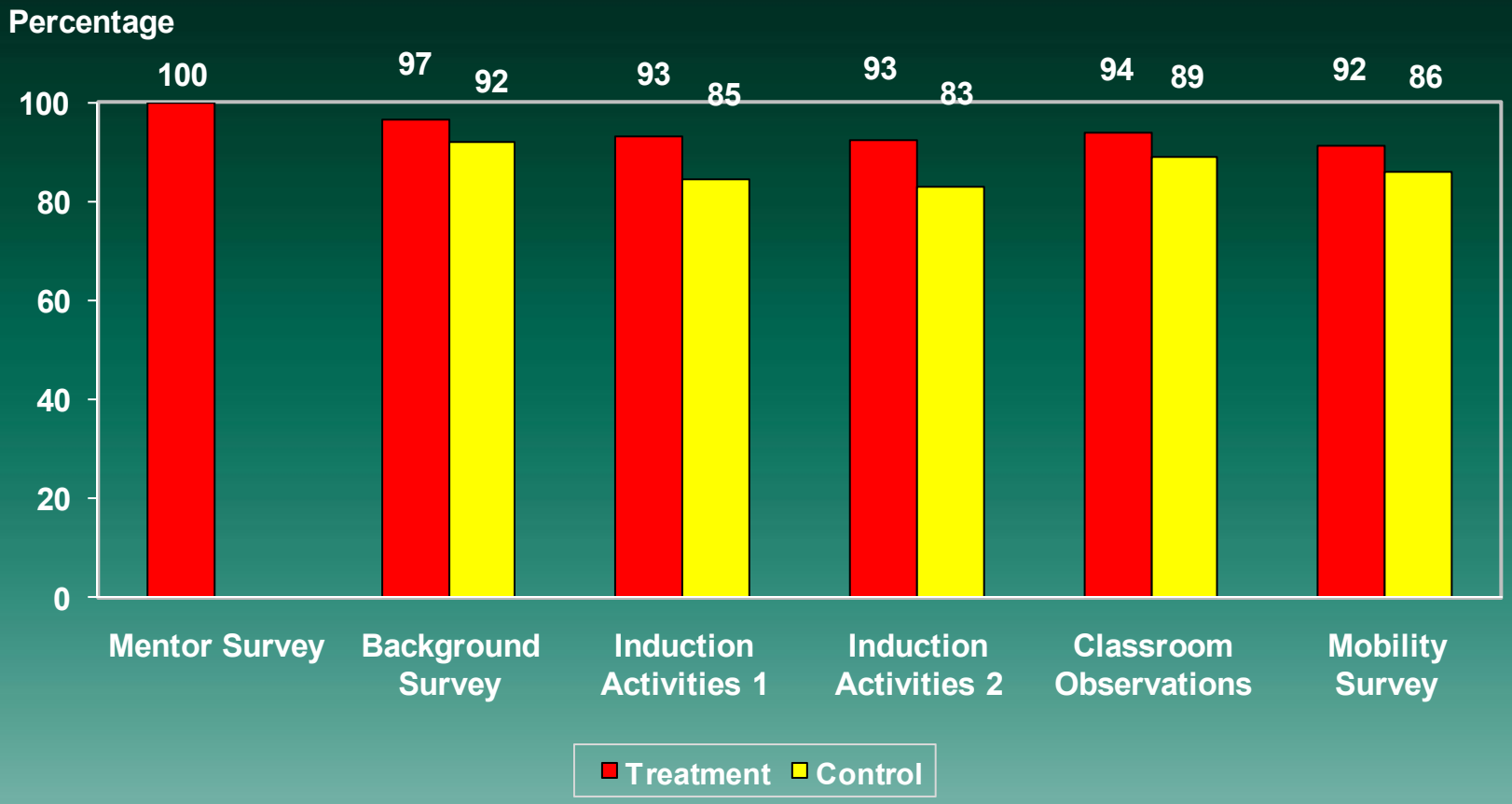
ETS Domain 3: INSTRUCTION

- Communicate clearly
- Use questioning and discussion techniques
- Engage students
- Provide feedback
- Demonstrate flexibility and responsiveness

→

- Content
- Activities and assignments
- Grouping
- Materials and resources
- Structure and pacing

High Response Rates; Small but Persistent T-C Difference



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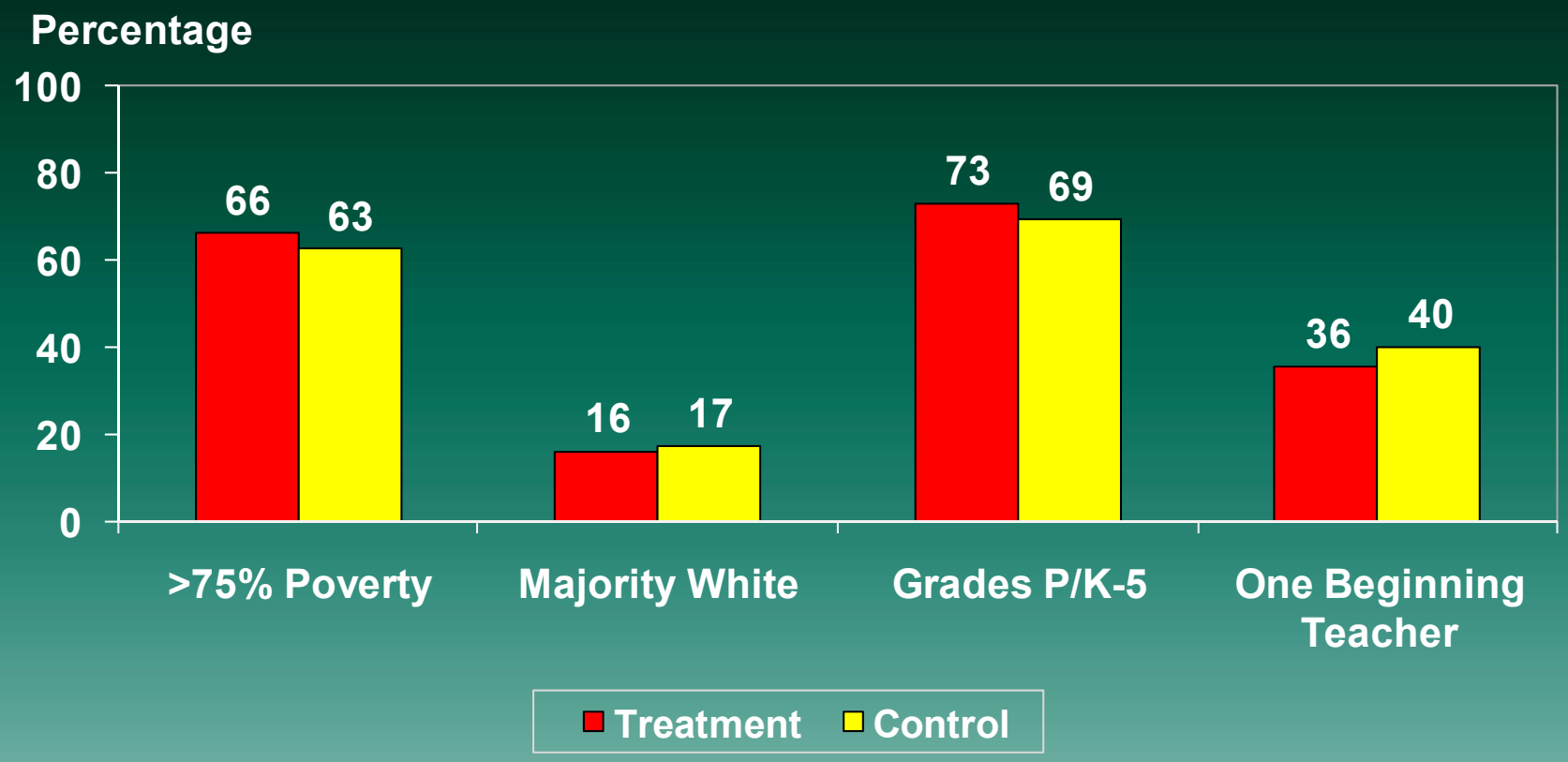
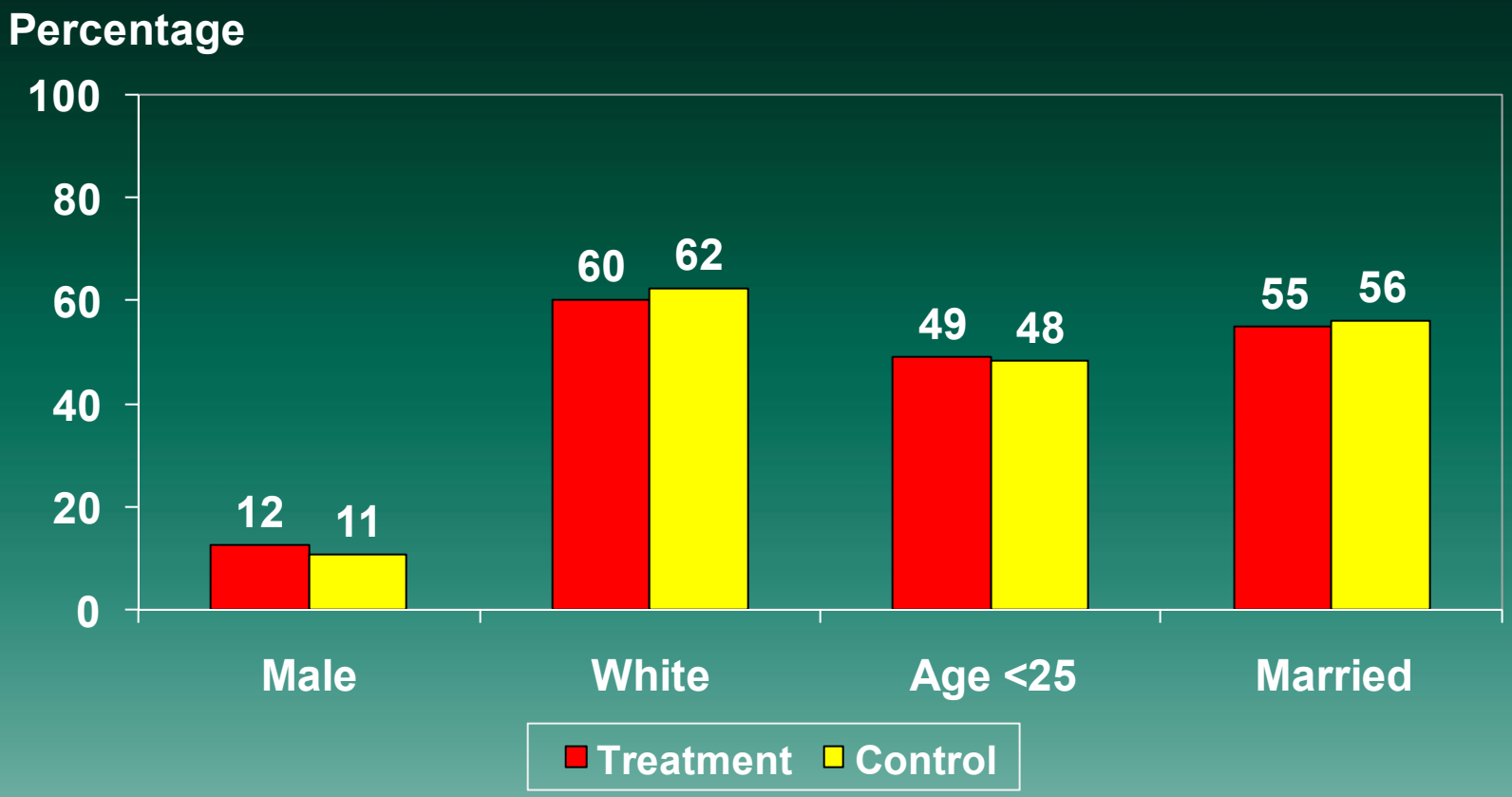
School Characteristics: No T-C Differences at Baseline



Treatment-control differences are not statistically significant (N = 418 schools).

Teacher Background: No T-C Differences at Baseline



Treatment-control differences are not statistically significant (N = 953 teachers).

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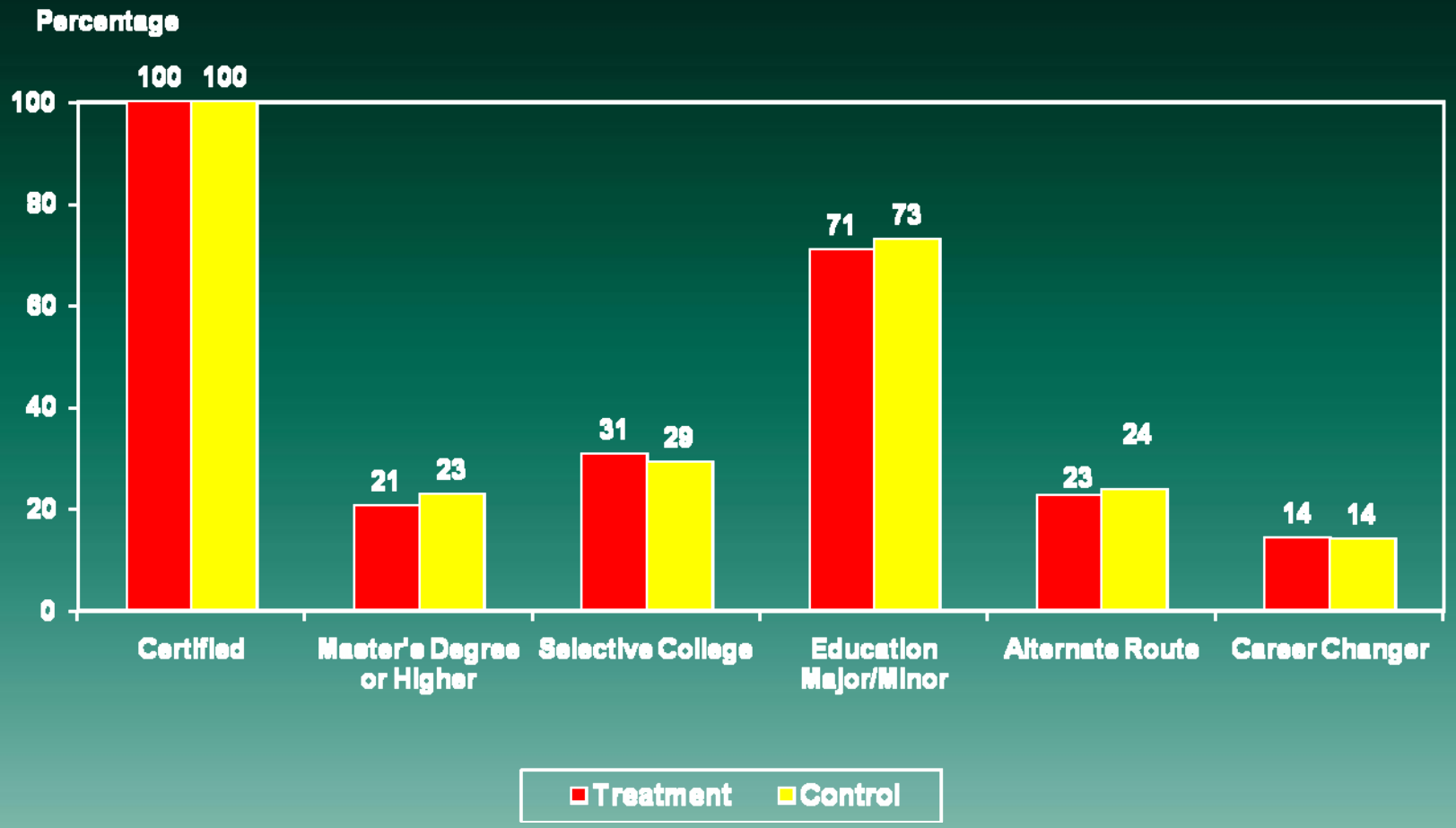
Teacher Professional Profile: No T-C Differences at Baseline



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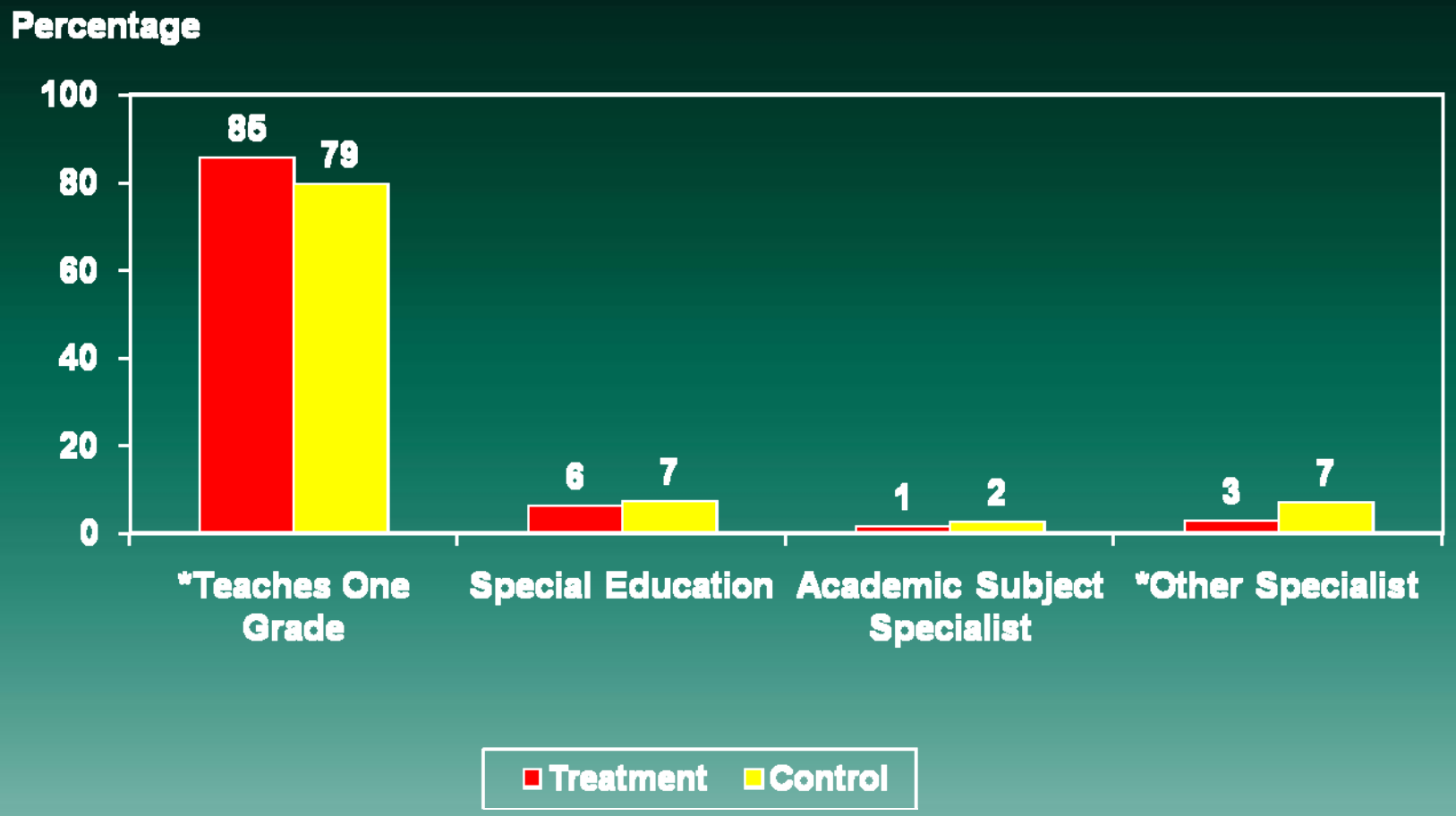
Teaching Assignment: Small T-C Differences at Baseline



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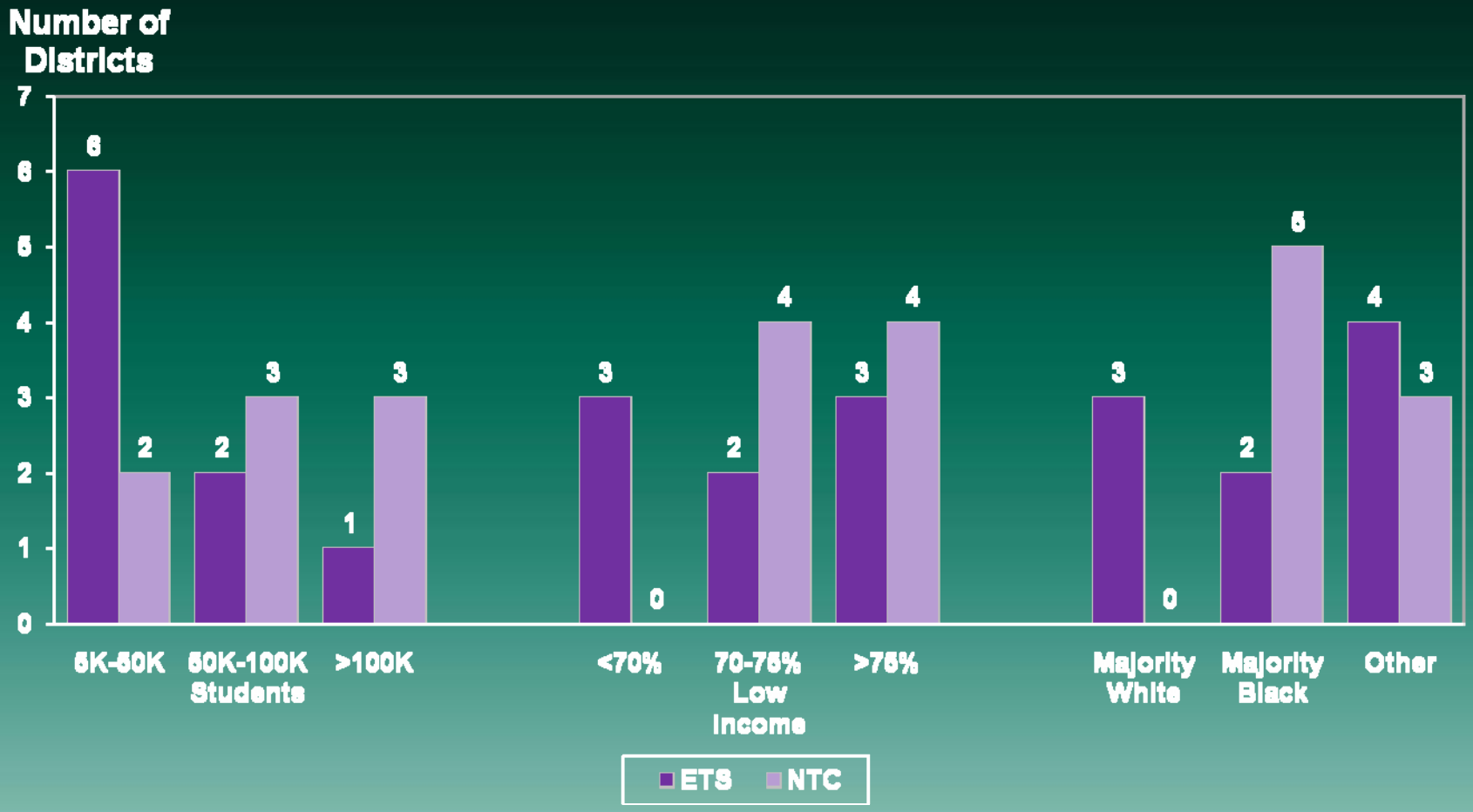
Districts in the Study: ETS & NTC in Different Contexts



Program Approach

- Mentor "tools"
  - Classroom profile
  - Periodic assessments
  - Weekly logs
- Plan-Teach-Reflect cycle
- Data used to inform teachers' practice
- Progressive scale of development

Professional Development

ETS Topics

- Communication with families
- Classroom management
- Differentiated instruction
- Teaching and assessment
- Analyzing student work
- Self-assessment

NTC Topics

- The learning environment
- Engaging students
- Assessing students
- Planning instruction
- Subject matter
- Self-assessment

Mentor Training Sessions (NTC)

- Define roles; identify needs; build relationships; develop coaching skills; understand framework; understand BT development
- Develop skills in collecting and analyzing student data; effective observation; strategic feedback; link lessons to professional standards
- Use data for lesson planning; differentiated instruction; review BT progress; formative assessment
- Review BT professional goals; reflect on BT and mentor growth; strong finish in the classroom

Understanding Differential Response Rates

- Vary “normally” by district
- Not explained by grade assignment, school race, school poverty
- Schools with many study teachers had somewhat higher response rate differentials
- Weights adjust using these characteristics

Hierarchical Model

Level 1: Teachers

$$Y_{ij} = c_j + \beta' X_{ij} + e_{ij}$$

Level 2: Schools

$$c_j = \mu + \delta T_j + \gamma' Z_j + u_j$$

Unified model

$$Y_{ij} = \mu + \delta T_j + \beta' X_{ij} + \gamma' Z_j + [u_j + e_{ij}]$$

Control Group Received Considerable Support

Mentoring

- 75% had an assigned mentor (13% full time)
- 74 minutes/week with mentor (38% during school hours)
- 81% say mentor meeting time is adequate

Professional Development

- 28% kept log, 42% observed others teaching

Treatment Group Received More

Mentoring

- 93% had assigned mentor (74% full time)
- 95 minutes/week with mentor (77% during school hours)

Professional Development

- Positive impacts on types, intensity of assistance
  - All 22 areas of guidance
  - Many areas of PD

Few Impacts on Professional Development Topics Attended

Percent of teachers reporting support in …	Treatment	Control	Impact
Most Common			
Instructional techniques	75.0	73.4	1.6
Content area knowledge	63.8	64.4	-0.6
Differentiated instruction	54.9	45.5	9.4*
Analyzing student work/assessment	56.3	41.8	14.5*
Preparing students for standardized testing	46.3	51.7	-5.4
Least Common			
Assigning grades/record keeping	22.8	19.6	3.3
Human resource policies	19.0	20.6	-1.7
Accessing school/district resources	19.3	17.4	1.9
Administrative paperwork	14.5	16.3	-1.8
Non-classroom duties (e.g. lunchroom)	12.9	11.4	1.5

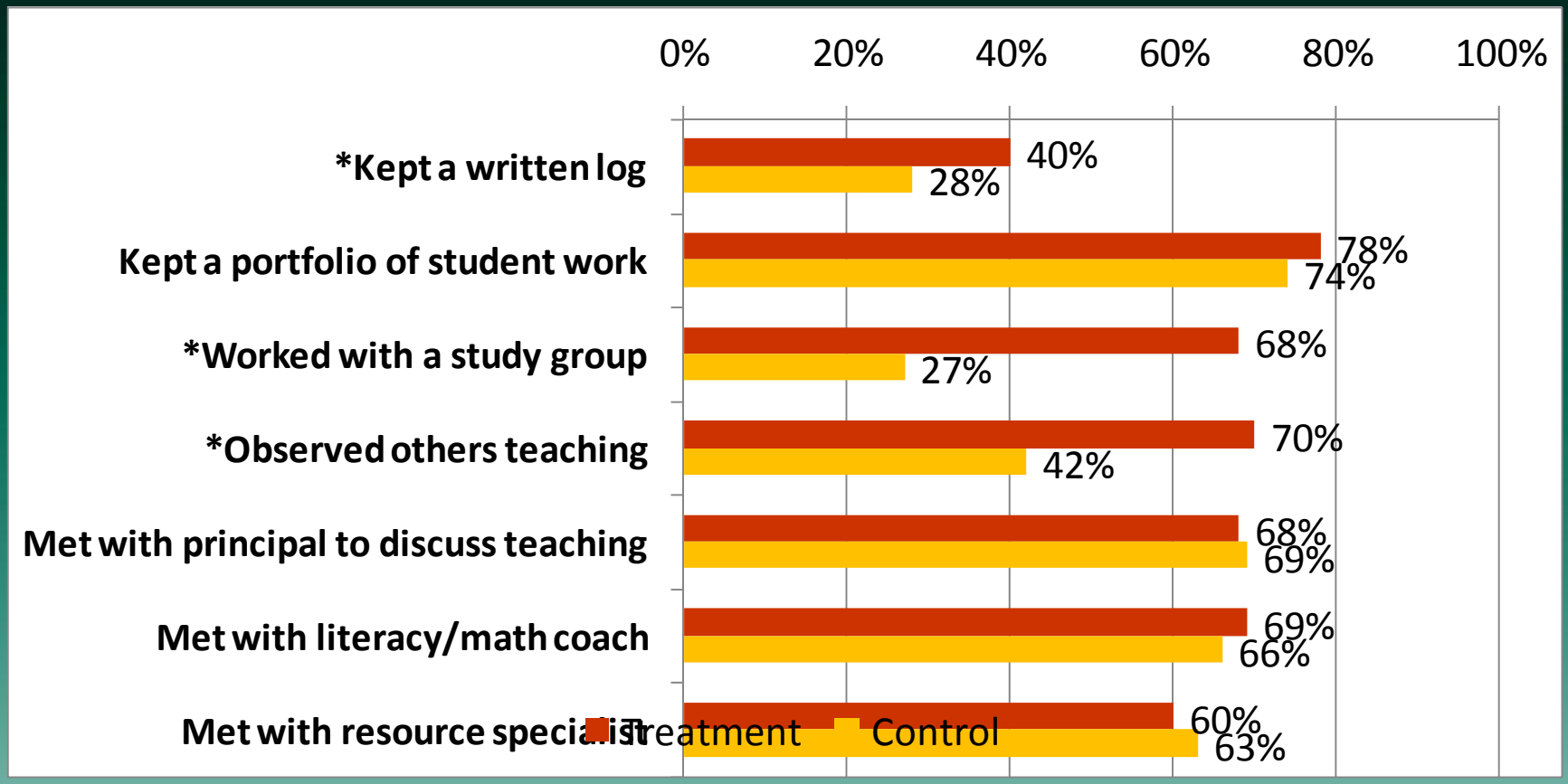
* Significantly different from zero at the 0.05 level, two-tailed test (N = 864 teachers).

No "Substitution Bias": Control Teachers Did Not Receive Extra Support from Principals

	Treatment	Control	Impact
Met with principal (%)	67.6	69.4	-1.8
Reduced teaching schedule (%)	7.5	6.3	1.1
Common planning time (%)	74.1	74.0	0.1
Teacher's aide (%)	34.6	35.6	-1.0
Regular communication with administrators (%)	57.7	63.1	-5.4
Extracurricular assignments (%)	41.6	42.0	-0.4
Administrative duties (%)	44.7	43.7	1.0
Times observed by principal past 3 mo (#)	2.1	2.0	0.1
Times received feedback on teaching as part of formal evaluation (#)	1.7	1.5	0.2*

* Significantly different from zero at the 0.05 level, two-tailed test (N = 868 teachers).

Treatment Teachers Engaged in More PD Activities



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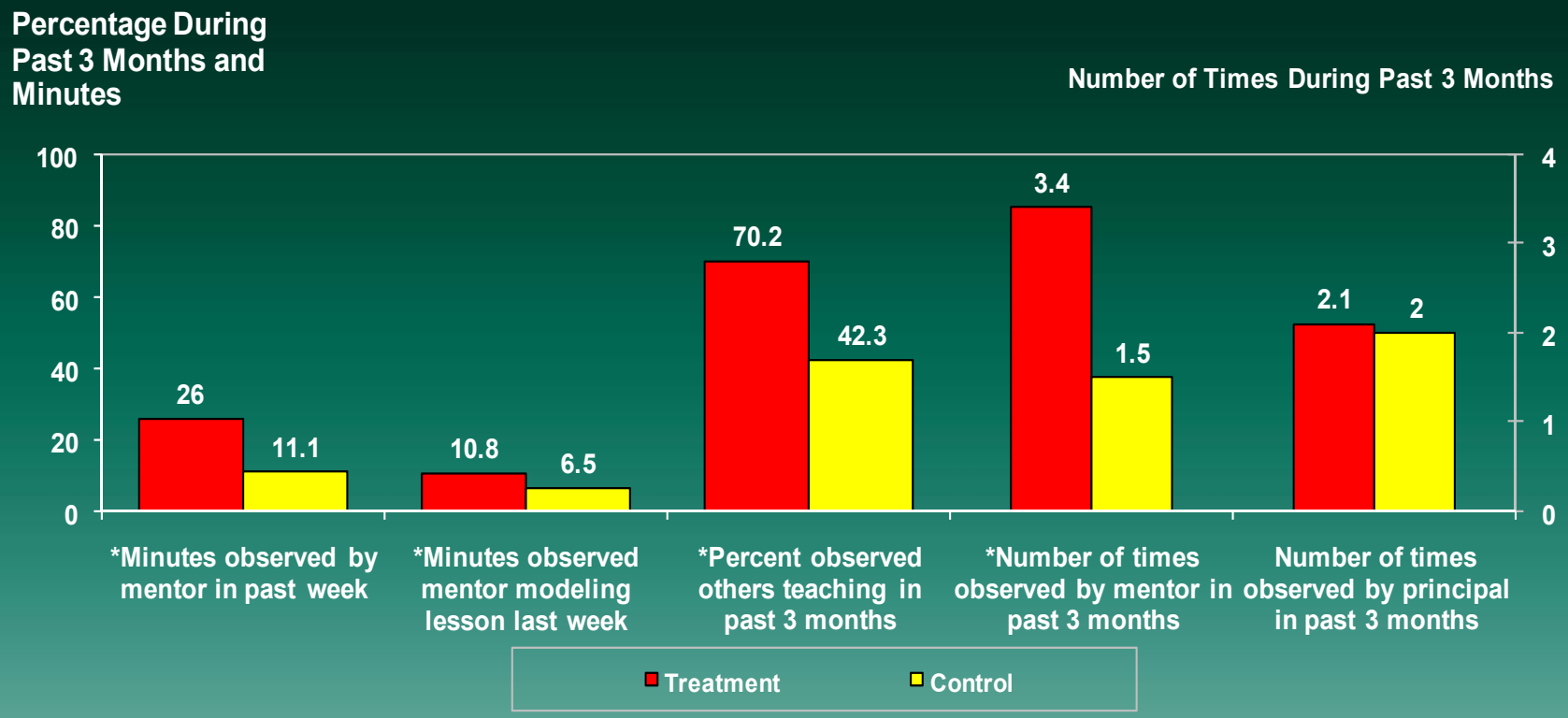
Treatment Teachers Were Observed More Frequently



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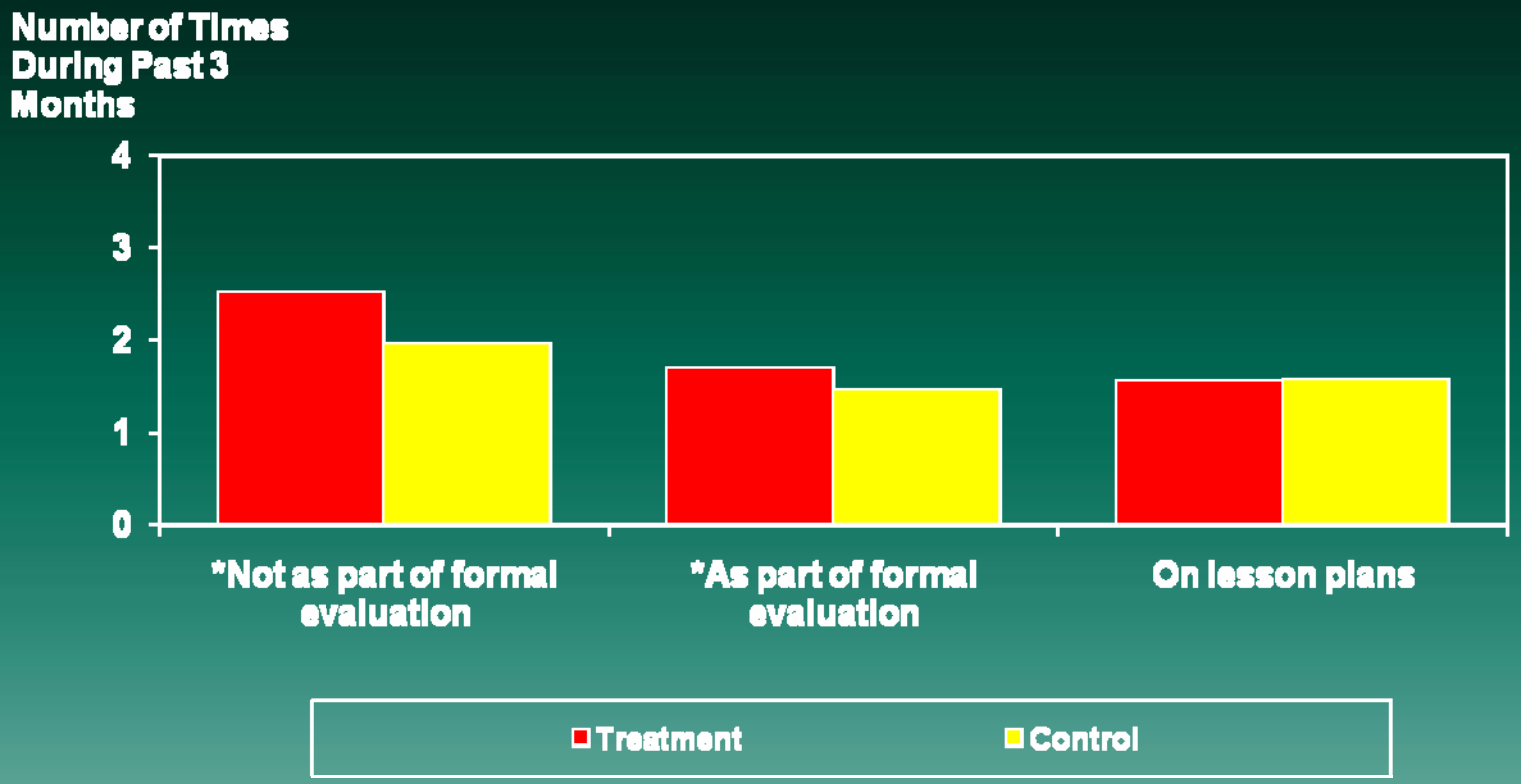
Treatment Teachers Were More Frequently Given Feedback



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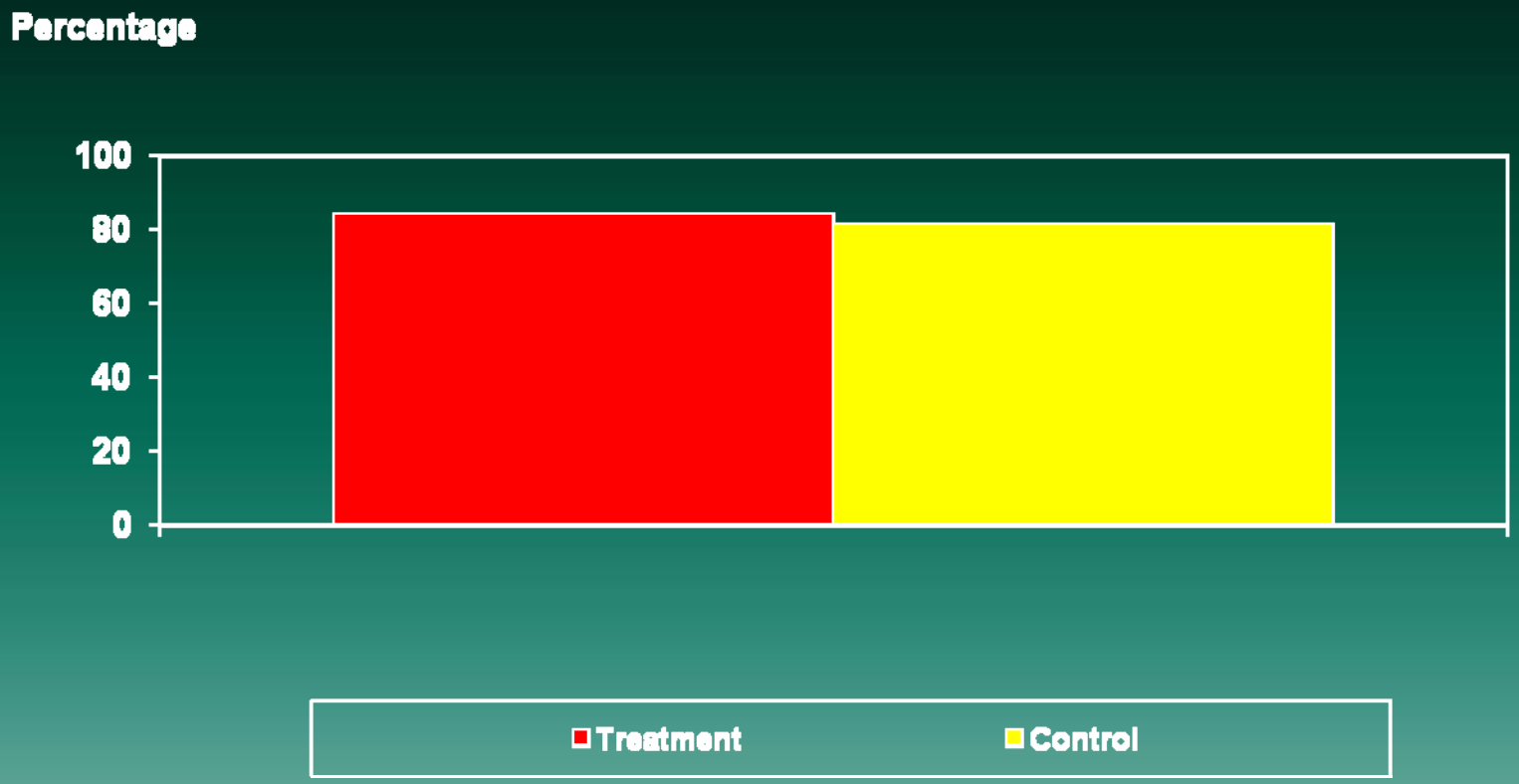
Treatment Teachers No More Likely to Feel Mentor Time Adequate



Treatment-control differences are not statistically significant (N = 871 teachers).

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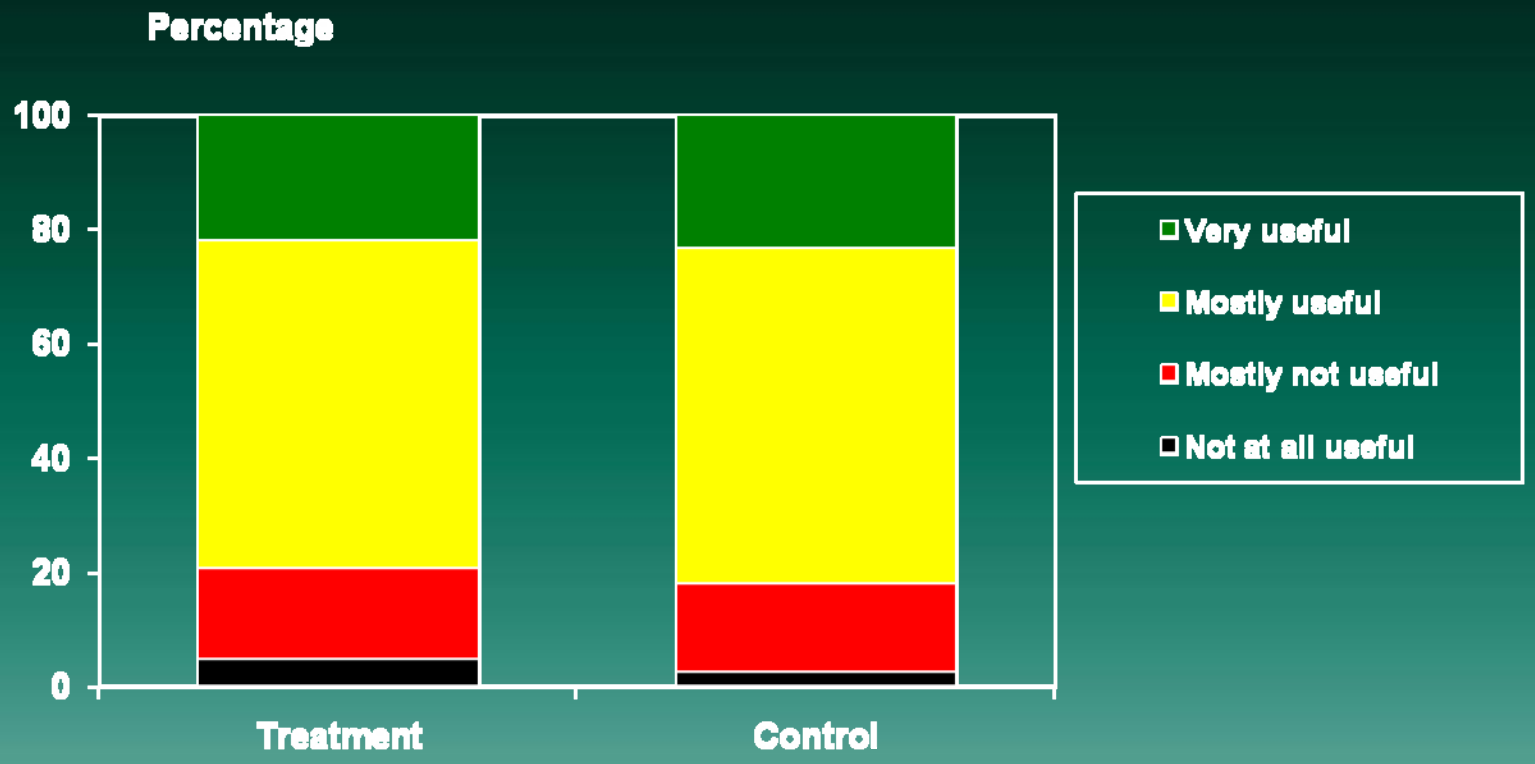
Treatment Teachers Were No More Likely to Feel PD Was Useful

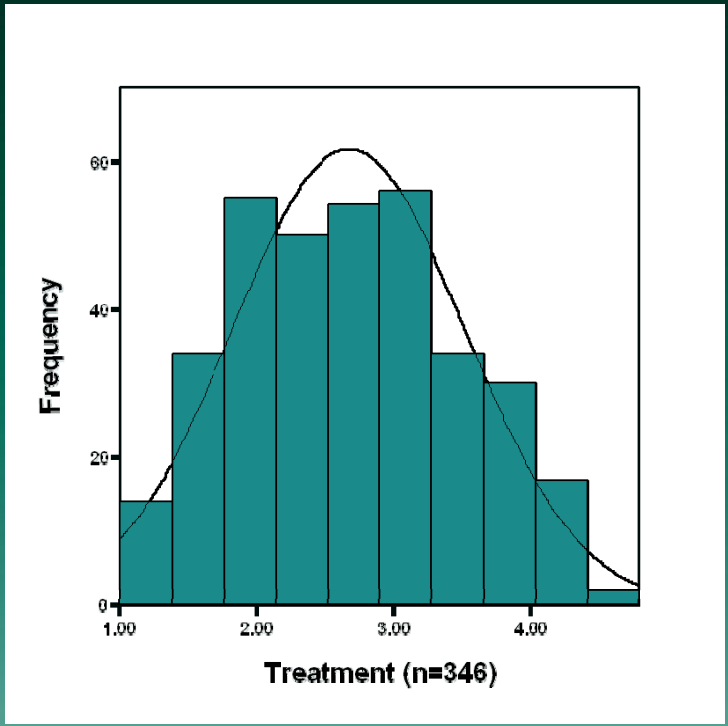


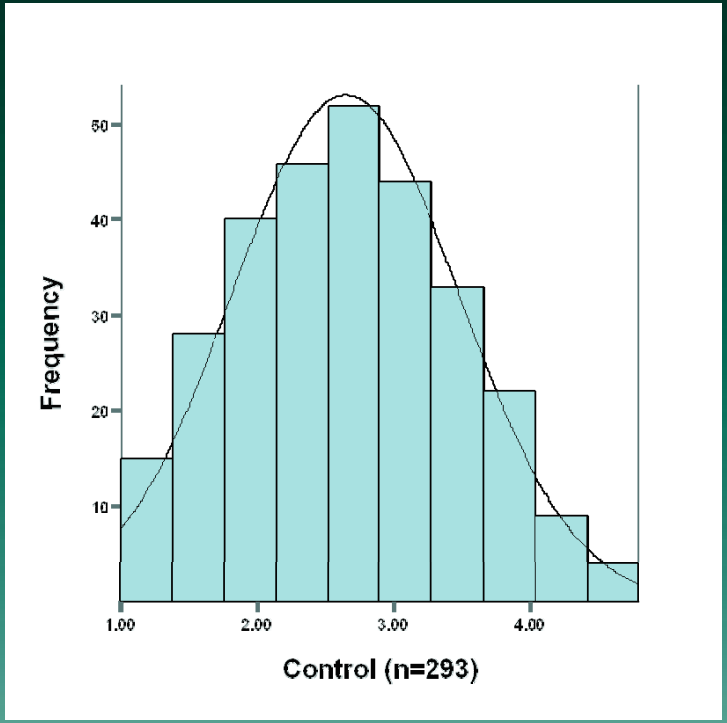
Treatment-control differences are not statistically significant (N = 871 teachers).

Vermont Classroom Observation Tool (VCOT)

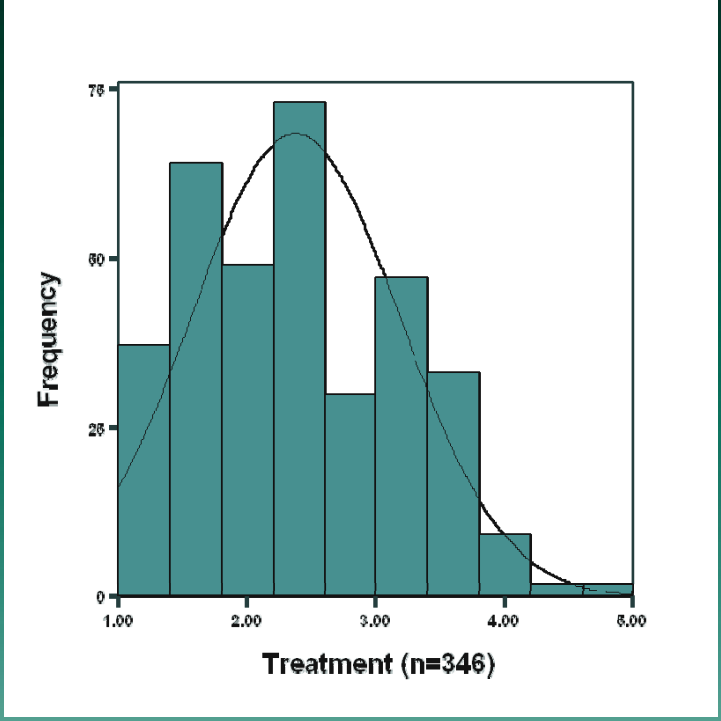
- Focus on three constructs: lesson implementation; content; classroom culture
- Items influenced by Horizon Research, Inc.; Praxis III; NCTE Standards; National Reading Panel
- Five point scale: "No" to "Extensive" evidence
- Average of indicators within each construct
- Close alignment with program goals and research on effective teaching practices (Cawelti 2004)

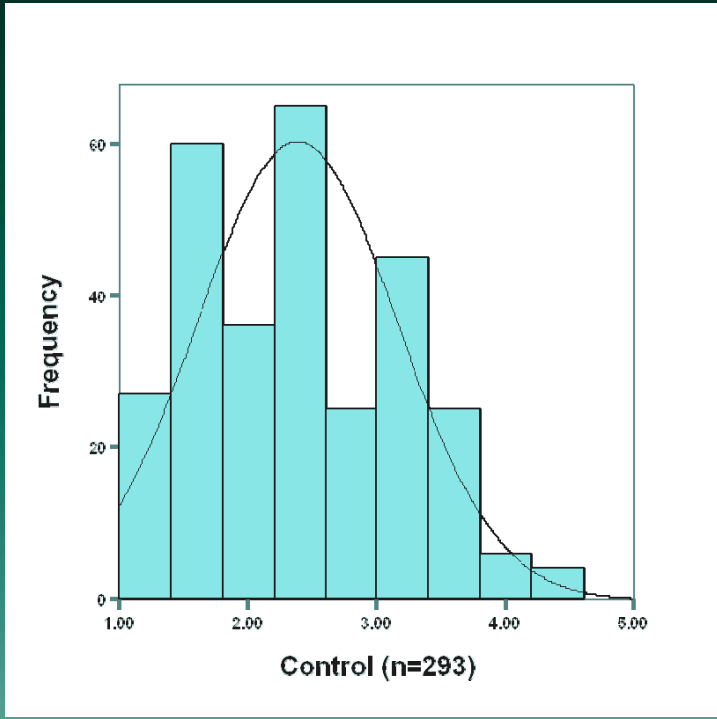
Distribution of Classroom Observation Scores: Literacy Implementation



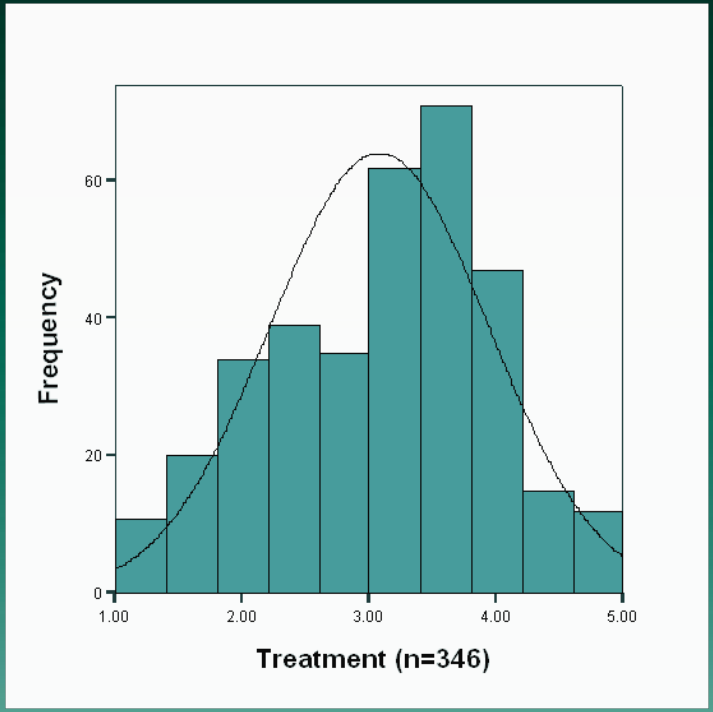


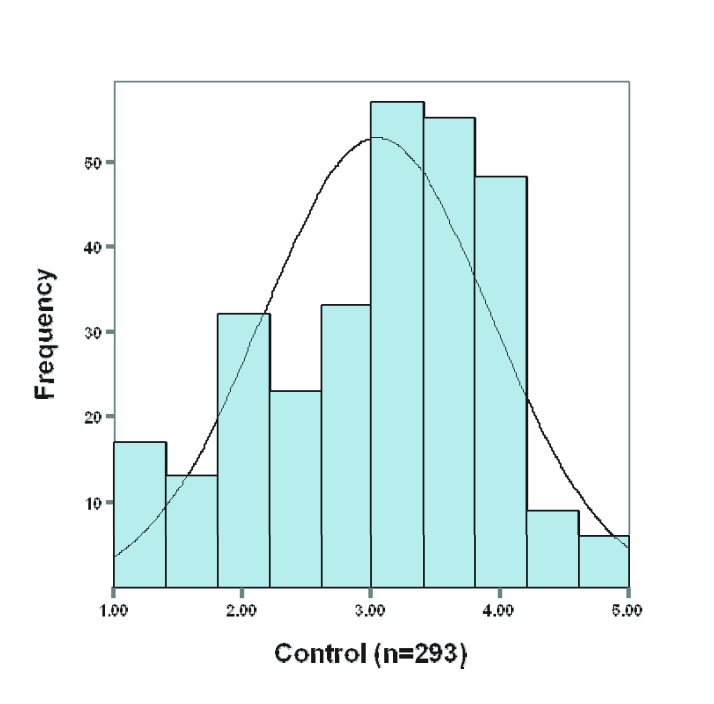
Distribution of Classroom Observation Scores: Literacy Content





Distribution of Classroom Observation Scores: Literacy Culture





Findings Are Robust to Alternative Specifications

- Grouped implementation and content items together based on factor analysis
- Used observer-reported summary score for each domain
- Used binary outcome variable: no/limited/moderate v. consistent/extensive evidence
- District and program provider subgroups

Achievement Findings Are Robust

Overall no-impact finding does not change:

- Including DIBELS scores
- Excluding pre-test covariate
- Adding teacher SAT/ACT score covariate
- Analyzing ETS and NTC separately

No Impact on Teacher Mobility

Outcome	Treatment	Control	Impact
Stayers			
Stayed at original school	75.0	74.6	0.3
Movers			
Moved, same district	11.2	10.6	0.6
Moved, different district	6.3	7.4	-1.1
Moved, private, parochial, or other school	2.4	1.4	1.1
Leavers			
Left, to stay at home	0.8	1.3	-0.5
Left, in school or new job	3.9	4.2	-0.3
Left, other	0.4	0.5	-0.1

* Significantly different from zero at the 0.05 level, two-tailed test (N = 903 teachers)

Reasons for Moving out of School

Reason	Treatment	Control	Impact
Moved out of area	6.2	7.3	-1.1
Moved, spouse/partner's job	0.0	3.7	-3.7
Salary or benefits	3.2	2.6	0.6
Job security	0.0	0.0	0.0
Workplace conditions (e.g. facilities, classroom resources, school safety, parent and community support)	6.3	10.1	-3.7
Opportunities for desirable teaching assignment	7.4	10.5	-3.1
Dissatisfied with administrative support	20.5	8.9	11.6
Principal's leadership	8.6	11.1	-2.5
Changes in responsibilities	0.0	0.0	0.0

Treatment-control differences are not statistically significant (N = 157).

Reasons for Moving out of School *(cont.)*

Reason	Treatment	Control	Impact
Challenges of implementing new reform measures	1.1	0.0	1.1
Difficulty with colleagues	0.0	0.0	0.0
Autonomy over the classroom	1.2	2.0	-0.8
Lesson planning time	0.0	0.0	0.0
Professional development opportunities	0.0	1.2	-1.2
Involuntary transfer	18.1	21.0	-3.0
Not asked to return	2.5	4.1	-1.5

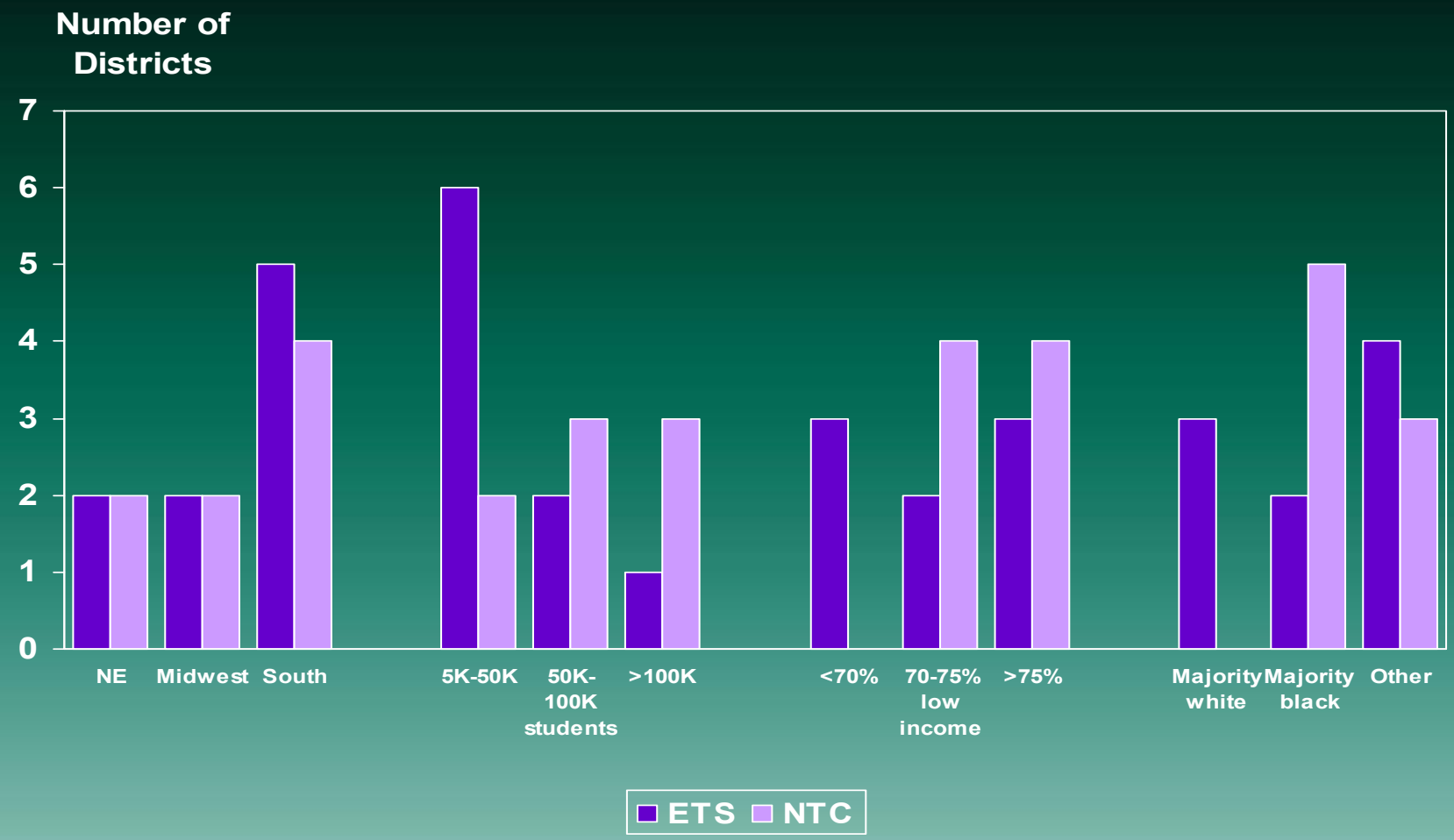
Treatment-control differences are not statistically significant (N = 157).

No Positive Retention or Composition Impacts

- Teacher retention in year 1 – no impacts
  - Not sensitive to nonresponse except for extreme assumptions
- Composition of stayers
  - Teacher attributes – no impacts
  - Effective practice – no impacts
  - Value added reading – no impact
  - Value added math – negative impact

Study Design and Sample

Districts in the Study: ETS and NTC Working in Different Contexts



Modest Design Effects, As Expected

- Cluster size (BT/school)
  - Median = 2, Mean = 2.4, Range = 1 to 18
- ICC (school level)
  - 0.03 for mobility
  - 0.14 for literacy lesson implementation score
  - 0.18 for literacy content score
  - 0.25 for classroom culture score
- Target MDEs achieved
  - Classroom observation measures: 0.23σ
  - Retention:
    - Targeted 5.5 points (at 90% retention),
    - Achieved 6.1 without covariates

Teacher Self-Selection Unlikely

Possible concerns	Treatment	Control	Impact
(1) Teacher hired after RA	14.8	12.5	2.4
(2) Teacher had role in selecting schools	53.4	51.1	2.2
(3) Teacher cited "program of support" as factor in job choice	25.4	28.0	2.7
(1) + (2)	6.8	4.8	2.0
(1) + (2) + (3)	0.0	0.0	0.0

Treatment-control differences are not statistically significant (N = 885 teachers).

Treatment Status Did Not Attract Teachers

Question	Treatment	Control	Impact
"Prior to being hired, had you heard about a teacher induction program in the district?"	26.6	41.2	-14.6*
Heard about program + hired after RA	4.7	5.6	-0.8

* Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers)

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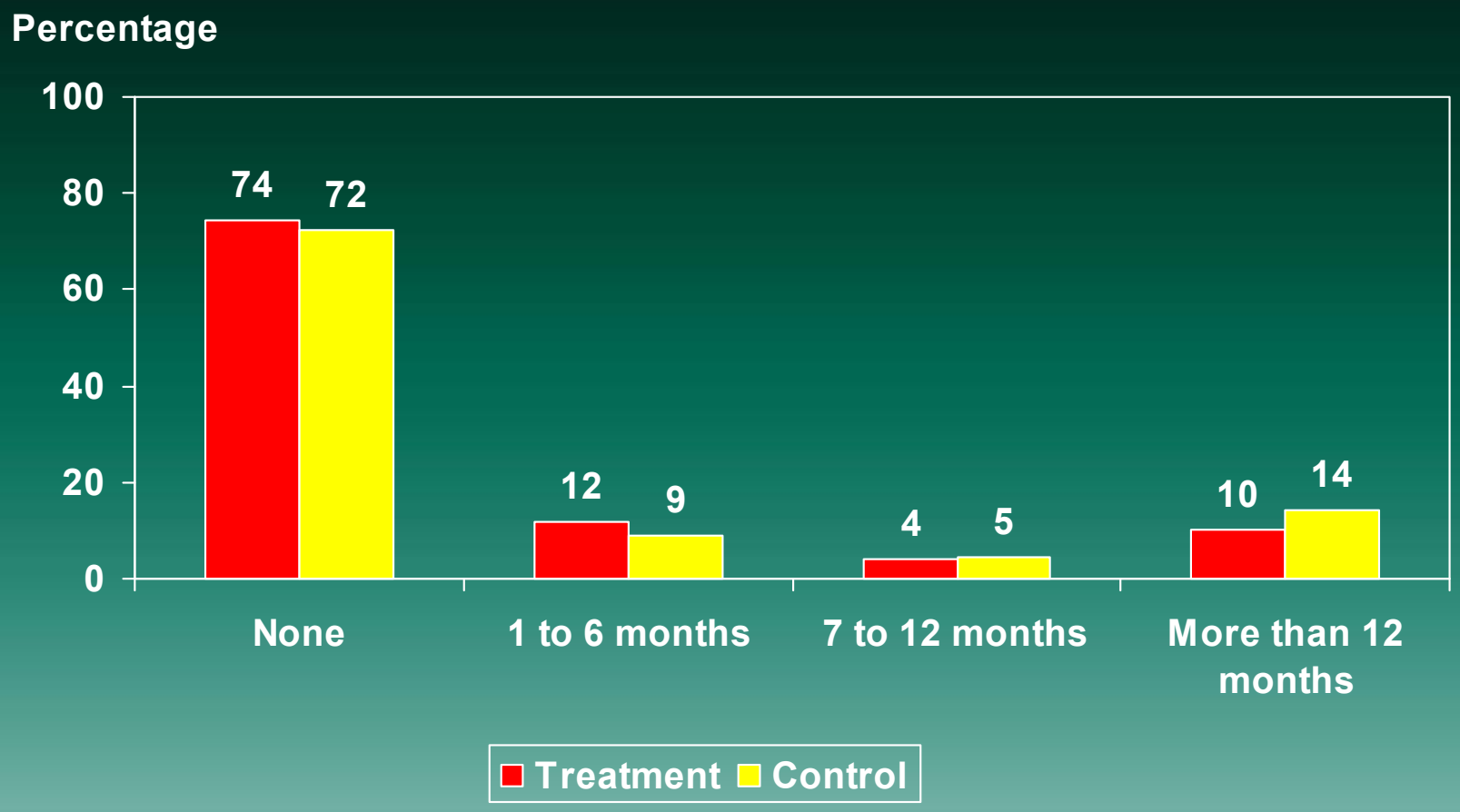
Self-Reported Prior Teaching Experience



Treatment-control differences are not statistically significant (N = 953 teachers).

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"Experienced" Teachers in the Induction Study

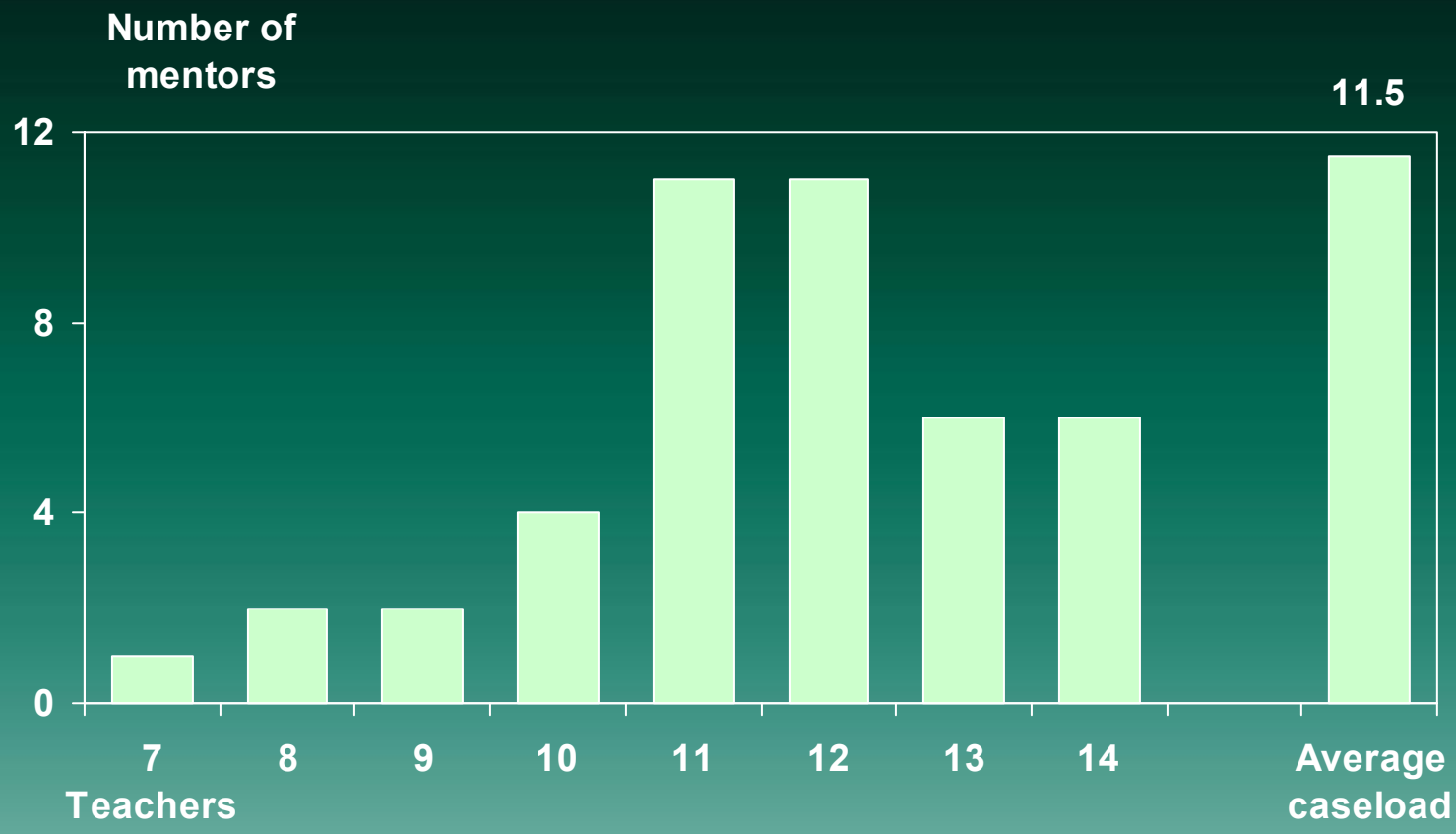
- "Experienced" means "Certified" or "Emergency certified" in public or private school at any grade level or teaching assignment
  - Teacher aide or sub experience not counted
- One district had 45% teachers with >6 months experience, others ranged from 9% to 26%
- All but 1 "experienced" teacher had salaries commensurate with *inexperienced* teachers

Induction Service Receipt

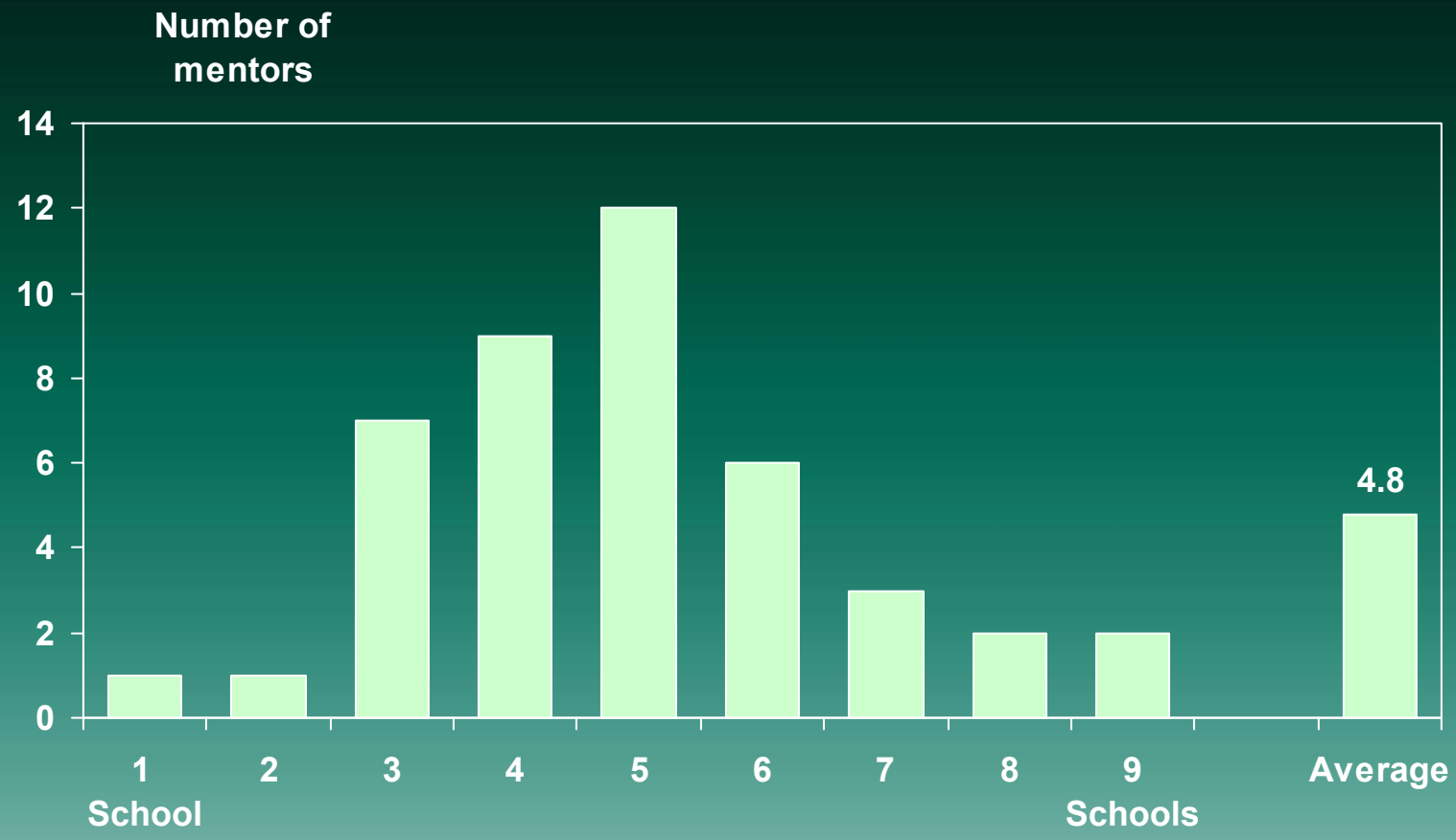
Definition of Mentoring

Mentoring describes a formal or informal learning relationship, usually between two individuals where the mentor has either experience or expertise in a particular area and provides information, advice, support, coaching, and feedback to the beginning teacher.

How Many Teachers Did Mentors Serve?



How Many Schools Did Mentors Serve?



Survey Questions on Mentor Time

- **Usual / scheduled time**
  - Is there a time when you and your mentor usually meet?
    Yes/No
  - How often do these meetings occur?
    Daily/2-4x per wk/Once a wk/2-3x per mo/Once a mo/Several x a yr
  - On average, how long are these meetings with your mentor?
    <15min/15-30min/30min-1hr/1-2hrs/>2hrs
  - Frequency x duration = scheduled time
- **Informal time**
  - During the most recent full week of teaching, how much informal (not scheduled) contact did you have with your mentor?
    No time/<15min/15-30min/30min-1hr/1-2hrs/>2hrs

Treatment Teachers Had More Formal Mentoring Relationships

Percentage who had…	Treatment	Control	Impact
A mentor	94	83	11*
An assigned mentor	93	75	17*
More than one mentor	29	17	13*
A full-time mentor	74	13	61*
A mentor who was also a teacher	30	66	-35*

* Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers).

Treatment Teachers Spent More Time Meeting with Mentors

Minutes per week	Treatment	Control	Impact
“Usual” meetings with mentor	59	38	21*
Informal meetings with mentor	36	36	0
Total meeting time with mentor	95	74	21*

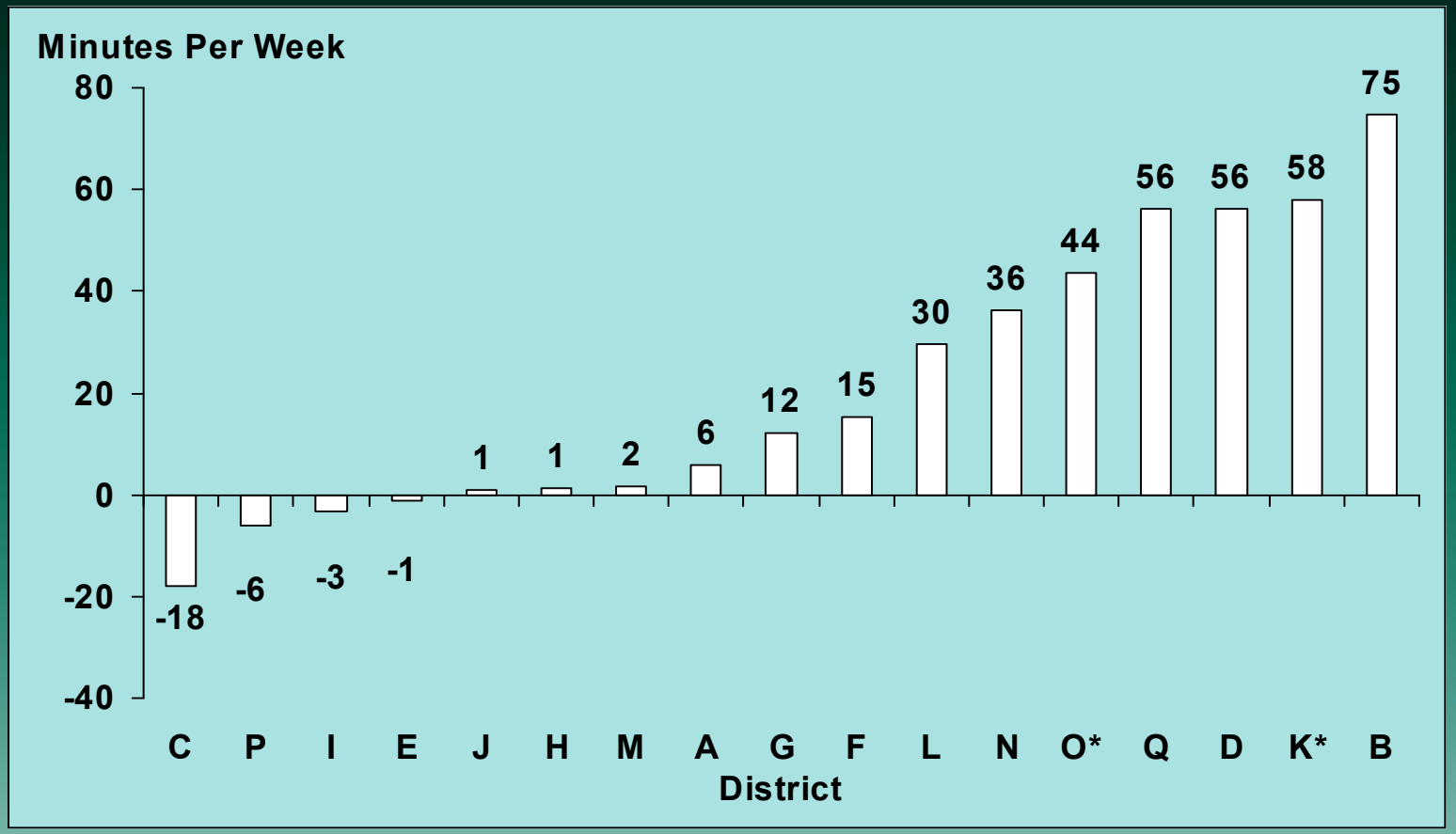
* Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers).

Mentor Meeting Times

Percentage who usually met a mentor…	Treatment	Control	Impact
During school hours	77	38	39*
Before or after school hours	38	31	7*
On weekends	1	0	1
Varies	2	3	-1
Any usual meeting time	86	54	32*

* Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers).

Impacts on Total Minutes Spent in Mentoring Per Week by District



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Treatment Teachers Received More Mentor Support in 22 Areas

Percentage of teachers who received mentor support in last 3 months in…	Treatment	Control	Impact
Reflecting on instructional practice	68	33	36*
Classroom management	65	40	25*
Discipline/behavior	62	42	20*
Multiple instructional strategies	61	38	23*
Teaching to varying ability levels	58	36	22*
Motivating students	57	36	21*
District/state standards	57	34	23*
School culture and policies	54	45	9*

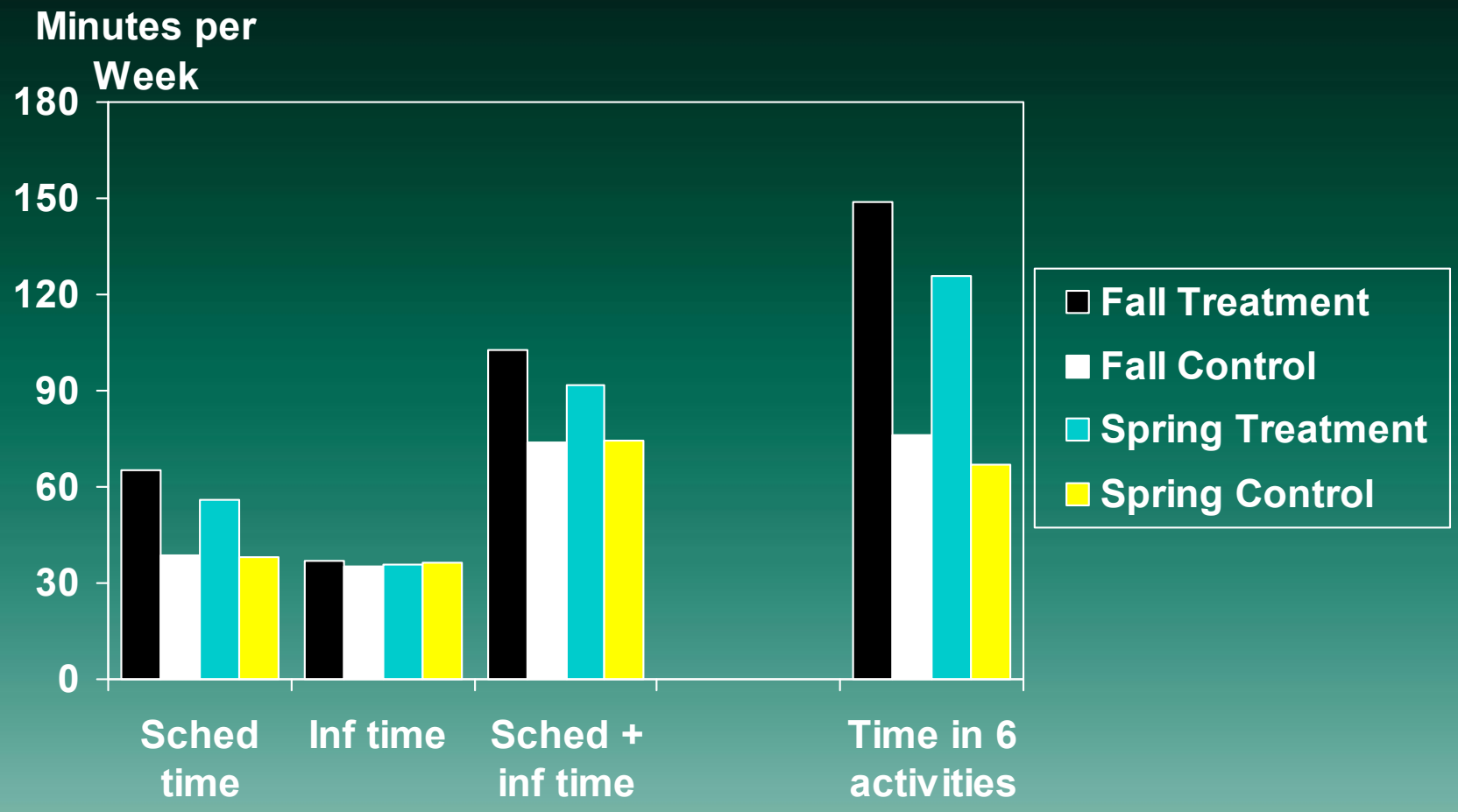
* Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers).

Treatment Teachers Engaged in More PD Activities

Percentage of teachers who…	Treatment	Control	Impact
Kept a written log	40	28	12*
Kept a portfolio and analysis of student work	78	74	4
Worked with a study group of new teachers	68	27	41*
Observed others teaching in their classrooms	70	42	28*
Met with principal to discuss teaching	68	69	-1
Met with literacy/math coach	69	66	2
Met with resource specialist	60	63	-2

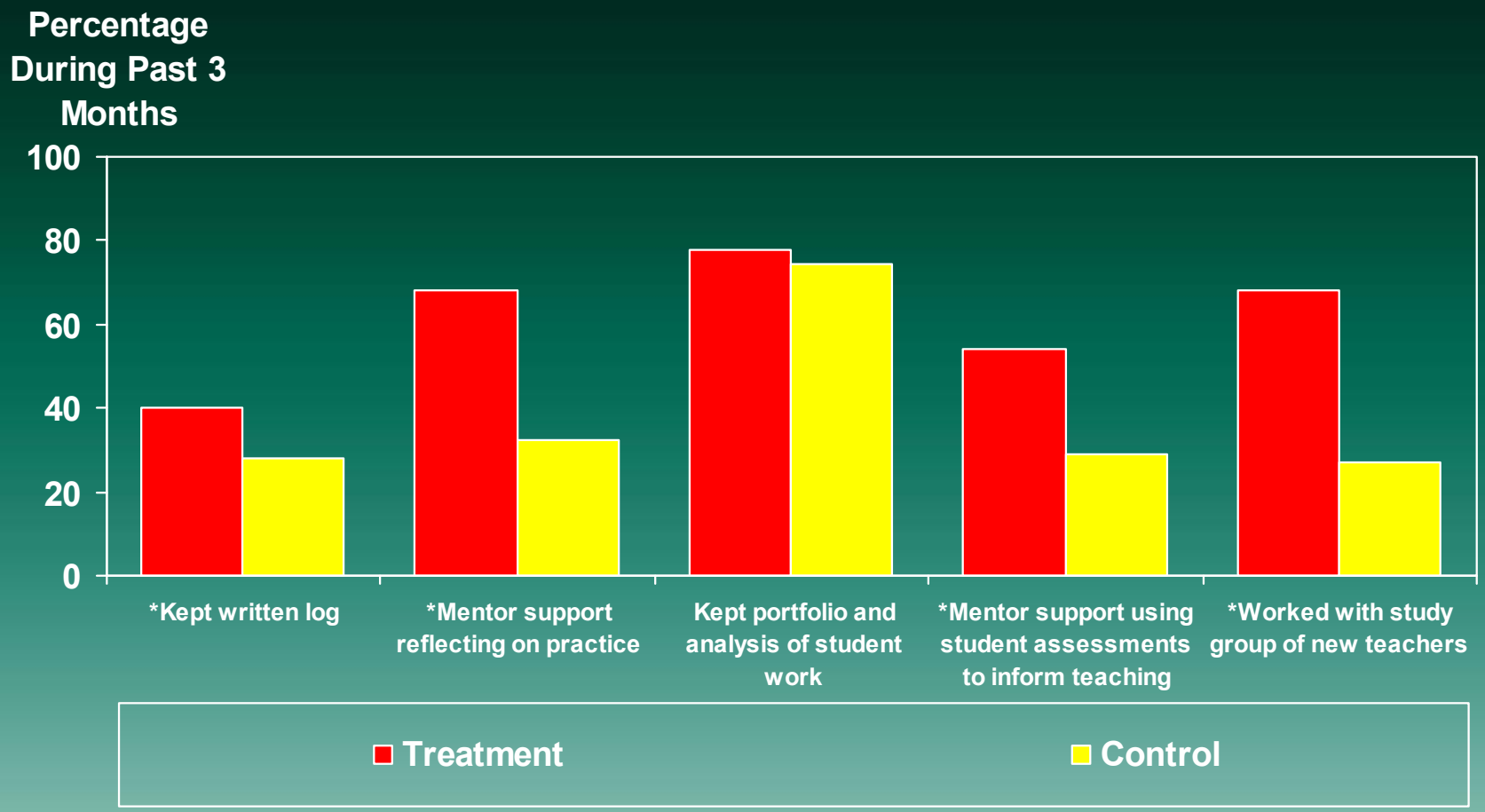
* Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers).

Impacts on Mentor Time Depend on Measure Used



* Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers).

Treatment Teachers Spent More Time in Activities Emphasized by Programs



* Significantly different from zero at the 0.05 level, two-tailed test (N = 874 teachers).

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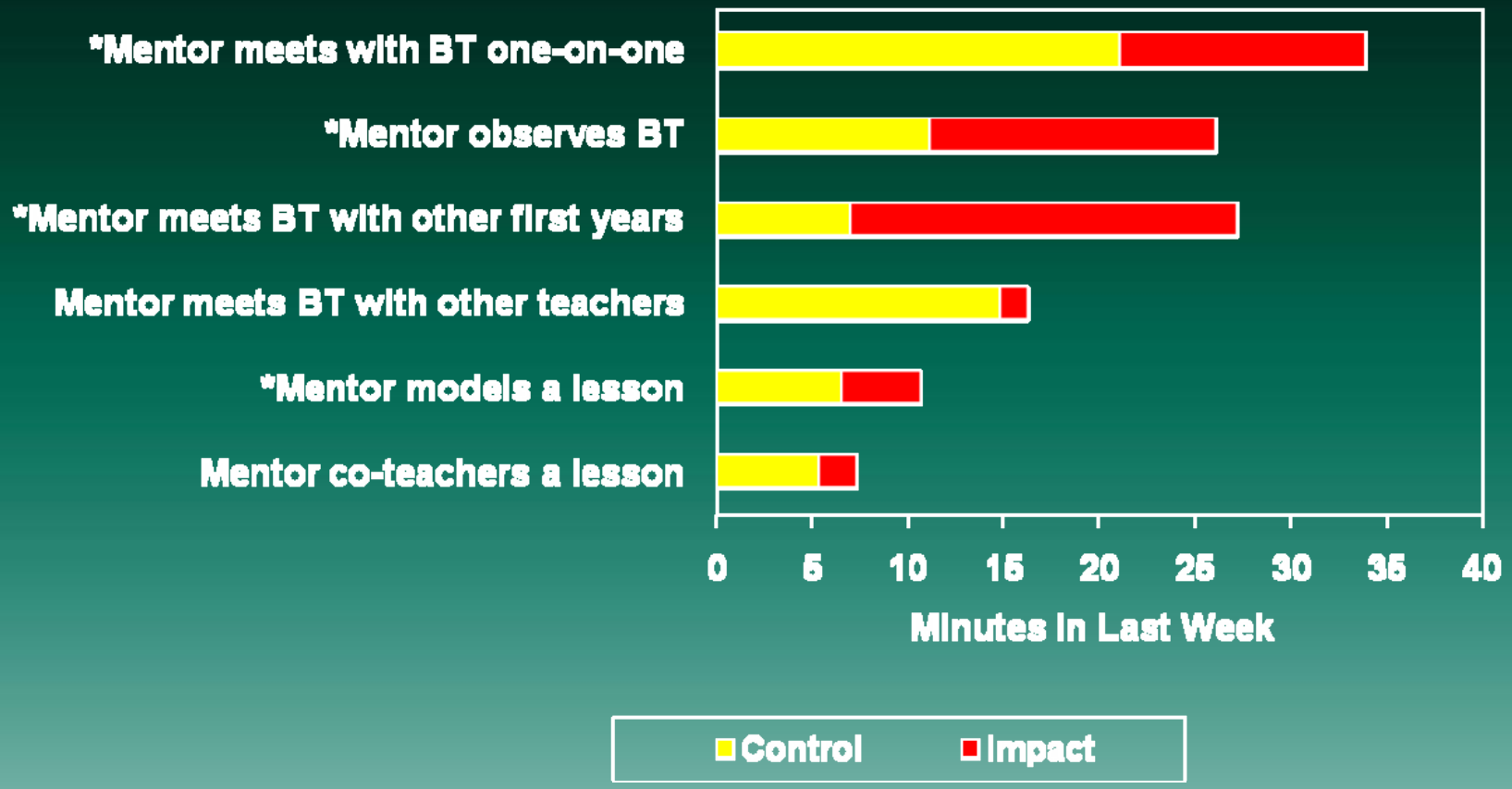
Impacts on Mentor Support in All Topic Areas in Past 3 Months Are Large

Percent of teachers reporting support in …	Treatment	Control	Impact
Most Common			
Reflecting on instructional practices	68.1	32.6	35.5*
Classroom activities, transitions, and routines	64.6	39.9	24.7*
Student discipline and behavior	62.2	42.2	20.0*
Using multiple instructional strategies	61.0	37.8	23.2*
Teaching children of varying abilities	58.2	35.8	22.3*
Least Common			
Teaching special needs students[1]	41.6	24.0	17.6*
Working with other teachers to plan instruction	40.0	33.3	6.7*
Working with other school staff	39.3	32.7	6.5*
Communicating with parents	38.0	30.6	7.4*
Teaching English language learners[1]	31.2	20.5	10.7*

* Significantly different from zero at the 0.05 level, two-tailed test (N = 883 teachers, 600-700 for 1).

Treatment Teachers Spent More Time in Mentoring Activities



BT = Beginning Teacher.

* Significantly different from zero at the 0.05 level, two-tailed test (N = 883 teachers).

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Comparison with Other Studies: General Supports

Supports received:	Our Control	S&I 2004[1]	CCSR 2007[2]
Participated in induction (%)	91	83	76
Had a mentor (%)	81	70	70
Reduced teaching schedule (%)	8	8	8
Common planning time (%)	74	71	71
Teacher's aide (%)	36	30	30
Regular communication with administrators (%)	63	81	81
Frequency of meetings per week[3] (#)	2.0		1.7

[1] Smith and Ingersoll (2004) using 1999-2000 SASS and 2000-2001 TFS data on first-year public school teachers.

[2] Kapadia, Coca, and Easton (2007) for Consortium on Chicago School Research using CCSR surveys of first-year elementary school teachers in 2004-2005.

[3] Constructed for elementary school teachers.

Comparison with Other Studies: Mentor Guidance

Received Mentor Guidance in … CCSR Question:	Our Study Question:	Our Control (%)	CCSR 2007[1] (%)
CPS policies	School culture and policies	45	85
Classroom mgmt		40	88
Teaching strategies	Using multiple instructional strategies	38	88
Assessing students		30	78
Parent communication		31	76
Analyzing student work		30	73
Frequency of interaction	Freq of usual mtgs	2 /wk	1.7 /wk

[1] Kapadia, Coca, and Easton (2007) for Consortium on Chicago School Research using CCRS surveys of first- and second-year elementary school teachers in 2004-2005. Percentages constructed from reports on mentor support: Did not receive/ Received, not helpful/ Received, somewhat helpful/ Received, very helpful.

No Positive Impacts on Key Outcomes

Impacts on Teacher Feelings of Preparedness

Area of Preparedness	Treatment	Control	Impact
Prepared to Instruct			
Managing classroom activities, transitions, and routines	69.7	73.6	-4.0
Using a variety of instructional methods	62.5	67.2	-4.7
Assessing your students	57.9	68.0	-10.1*†
Selecting and adapting instructional materials	53.6	61.0	-7.3*†
Planning effective lessons	72.6	78.9	-6.3*
Being an effective teacher	69.3	76.7	-7.4*†
Addressing the needs of a diversity of learners	58.9	67.3	-8.4*†

•Significantly different from zero at the 0.05 level, two-tailed test (N = 885 teachers).

† Significantly different from zero after applying Benjamini-Hochberg correction.

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Impacts on Teacher Feelings of Preparedness *(cont.)*

Area of Preparedness	Treatment	Control	Impact
Prepared to Work with Students			
Handling a range of classroom behavior or discipline situations	64.4	66.3	-1.9
Motivating students	73.2	75.1	-1.9
Working effectively with parents	61.6	62.2	-0.6
Working with students with special challenges	38.1	41.5	-3.3
Prepared to Work with Other School Staff			
Working with other teachers to plan instruction	72.3	75.5	-3.2
Working with the principal or other instructional leaders	64.1	71.6	-0.16

Treatment-control differences are not statistically significant (N = 885 teachers).

Impacts on Teacher Satisfaction

Area of Satisfaction	Treatment	Control	Impact
Satisfaction with School			
Administrative support for beginning teachers	75.6	75.9	-0.01
Availability of resources and materials/equipment for your classroom	67.3	68.0	-0.7
Input into school policies and practices	67.6	71.6	-4.0
Opportunities for professional development	85.5	83.8	1.7
Principals' leadership and vision			
Professional caliber of colleagues	80.6	76.2	2.4
Supportive atmosphere among faculty/collaboration with colleagues	81.7	86.1	-4.5

Treatment-control differences are not statistically significant (N = 885 teachers).

Impacts on Teacher Satisfaction *(cont.)*

Area of Satisfaction	Treatment	Control	Impact
Satisfaction with School (cont.)			
School facilities such as the building or grounds	76.6	75.0	1.6
School policies	81.2	79.7	1.5
Satisfaction with Class			
Autonomy or control over own classroom	86.5	86.7	-0.2
Student motivation to learn	75.2	72.8	2.4
Student discipline and behavior	66.8	62.3	4.5
Parental involvement in the school	46.2	46.2	0.0
Grade assignment	89.3	87.4	1.8
Students assigned	83.5	84.4	-0.9

Treatment-control differences are not statistically significant (N = 885 teachers).

Impacts on Teacher Satisfaction *(cont.)*

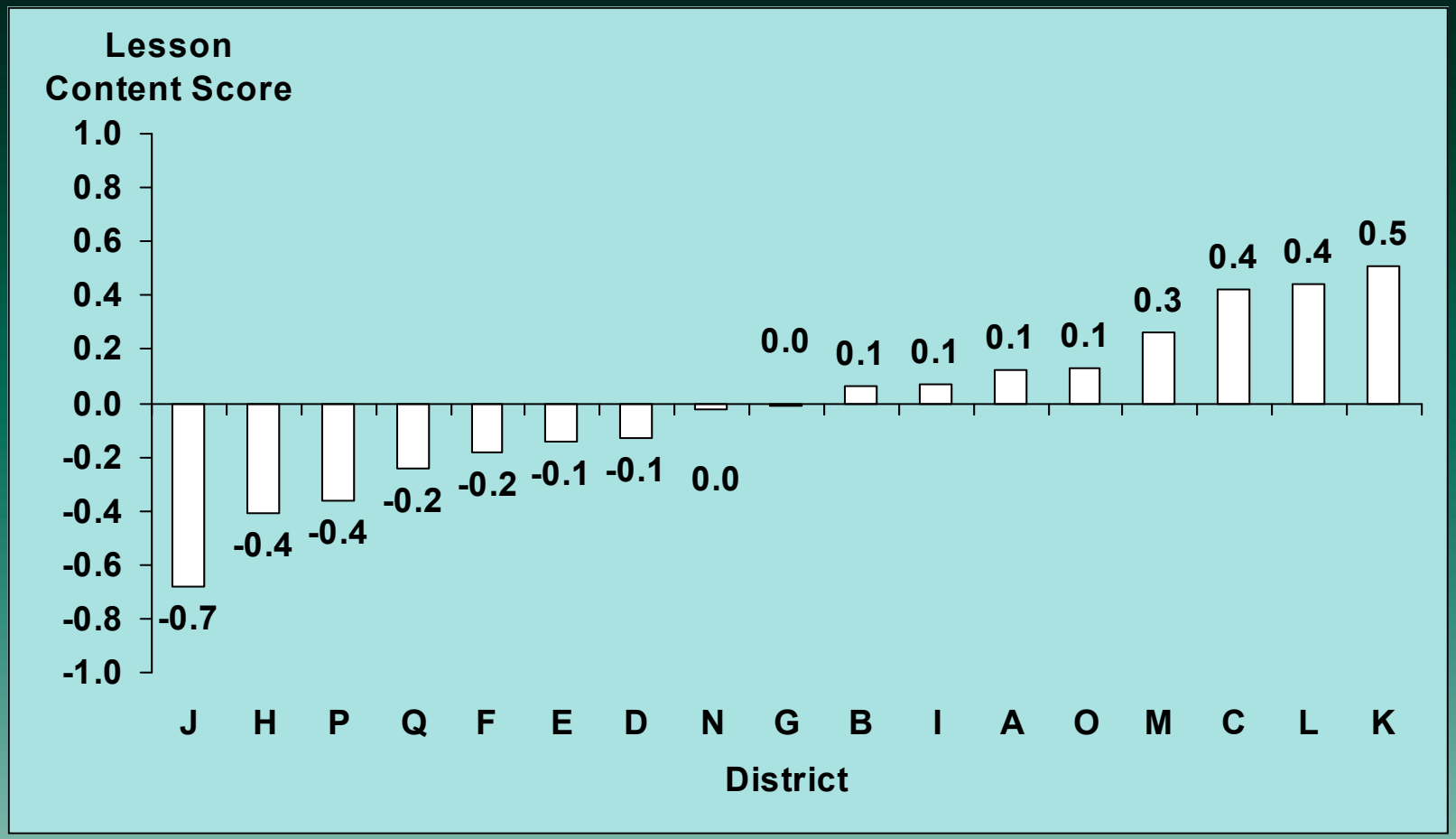
Area of Satisfaction	Treatment	Control	Impact
Satisfaction with Teaching Career			
School facilities such as the building or grounds	76.6	75.0	1.6
School policies	81.2	79.7	1.5
Autonomy or control over own classroom	86.5	86.7	-0.2
Student motivation to learn	75.2	72.8	2.4
Student discipline and behavior	66.8	62.3	4.5
Parental involvement in the school	46.2	46.2	0.0
Grade assignment	89.3	87.4	1.8
Students assigned	83.5	84.4	-0.9

Treatment-control differences are not statistically significant (N = 885 teachers).

VCOT Training and Reliability

- Observers all had teaching experience
- Training was intensive:
  - Multiple sessions
  - Videotaped observations
  - "Live" practice observations
  - Field check for "drift"
- Construct reliability determined by a "gold standard" score

Impacts on Classroom Practices by District



No Impacts on Classroom Practices

Score on a 5-point scale for…	Treatment	Control	Impact
Implementation of literacy lesson	2.7	2.6	0.0
Content of literacy lesson	2.4	2.4	0.0
Classroom culture	3.1	3.0	0.0

Treatment-control differences are not statistically significant (N = 885).

Impacts on Classroom Practices

Classroom Observation Item	Treatment	Control	Impact
Implementation of Literacy Lesson			
Best practices	23.4	27.2	-3.8
Institutional choices	28.8	30.7	-1.8
Student choices	18.2	18.4	-0.2
Pace	24.2	26.3	-2.1
Content of Literacy Lesson			
Understanding content and close reading	23.5	25.4	-1.9
Assessment	7.2	7.4	-0.2
Skill development	17.9	17.8	0.1
Connections between reading and writing	15.9	17.0	-1.1

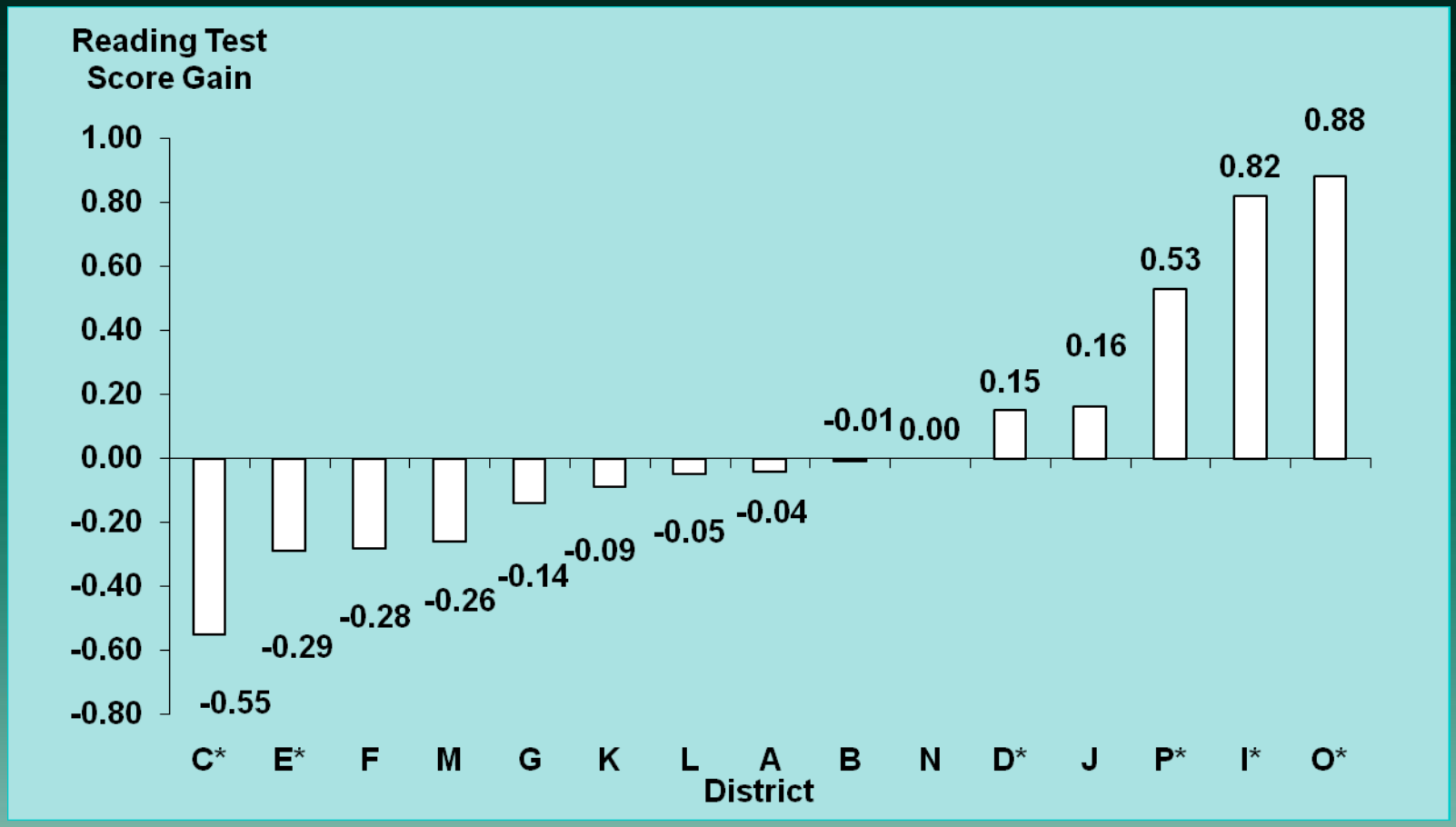
Treatment-control differences are not statistically significant (N = 631).

Impacts on Classroom Practices *(cont.)*

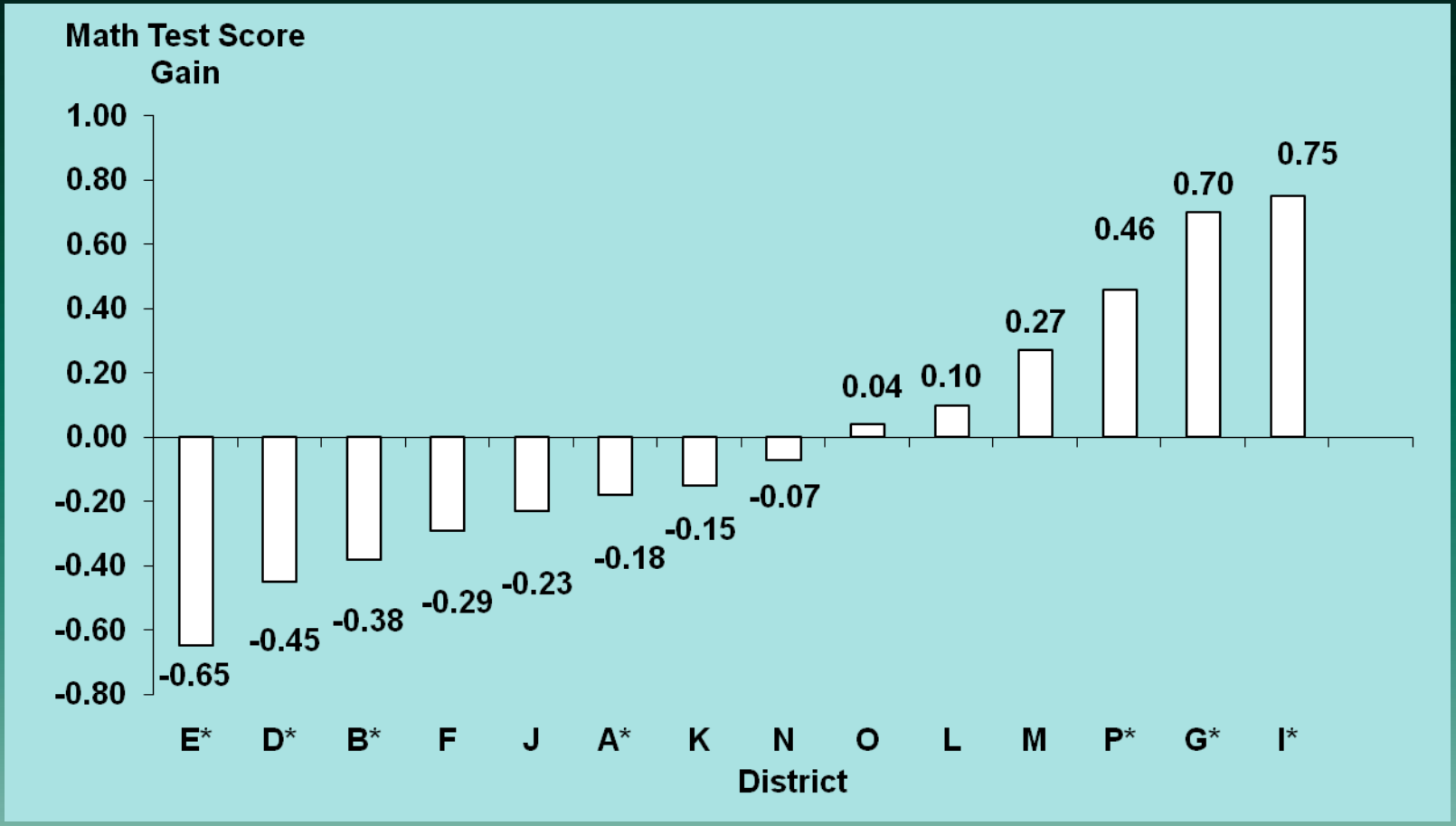
Classroom Observation Item	Treatment	Control	Impact
Classroom Culture			
Maximizes learning opportunities	44.4	46.4	-2.0
Routines clear and consistent	46.1	49.4	-3.3
Behavior respectable, atmosphere safe	45.3	44.0	1.2
Literacy valued	28.1	31.1	-3.0
Teacher works collaboratively with students	39.5	37.2	2.2
Students work collaboratively with other students	25.0	23.8	1.2
Equal access to teacher and resources	41.3	46.0	-4.6

Treatment-control differences are not statistically significant (N = 631).

Impacts on Reading Test Scores by District



Impacts on Math Test by District



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No Positive Impacts on Test Scores

Grade	Impact (E.S.)	P-value	#Students	#Teachers
2 Reading	-0.22*	0.034	543	42
3 Reading	-0.13	0.119	1,113	75
4 Reading	0.04	0.421	1,679	108
5 Reading	0.01	0.843	1,516	81
All Grades, Reading	**0.01**	**0.735**	**4,899**	**283**
2 Math	-0.38*	0.000	472	35
3 Math	-0.26*	0.002	837	65
4 Math	0.03	0.617	1,545	99
5 Math	-0.04	0.549	1,510	81
All Grades, Math	**-0.05**	**0.184**	**4,412**	**261**

* Significantly different from zero at the 0.05 level, two-tailed test (N = 885).

Impacts of Reading Test Scores – No Pretests

Grade	Impact (E.S.)	P-value	#Students	#Teachers
1	-0.02	0.827	643	46
2	-0.09	0.283	1,070	58
3	-0.14	0.163	1,845	108
4	0.02	0.774	1,971	109
5	0.04	0.599	2,127	101
6	-0.88*†	0.000	55	4
All Grades	**-0.04**	**0.362**	**7,711**	**389**

•Significantly different from zero at the 0.05 level, two-tailed test (N = 885).

† Significantly different from zero after applying Benjamini-Hochberg correction.

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Impacts of Math Test Scores – No Pretests

Grade	Impact (E.S.)	P-value	#Students	#Teachers
1	0.17	0.174	534	30
2	-0.32*†	0.001	971	52
3	-0.22*†	0.023	1,784	106
4	0.02	0.807	1,989	110
5	0.05	0.440	2,112	101
6	-0.48*†	0.000	55	4
All Grades	**-0.05**	**0.293**	**7,445**	**366**

•Significantly different from zero at the 0.05 level, two-tailed test (N = 885).

† Significantly different from zero after applying Benjamini-Hochberg correction.

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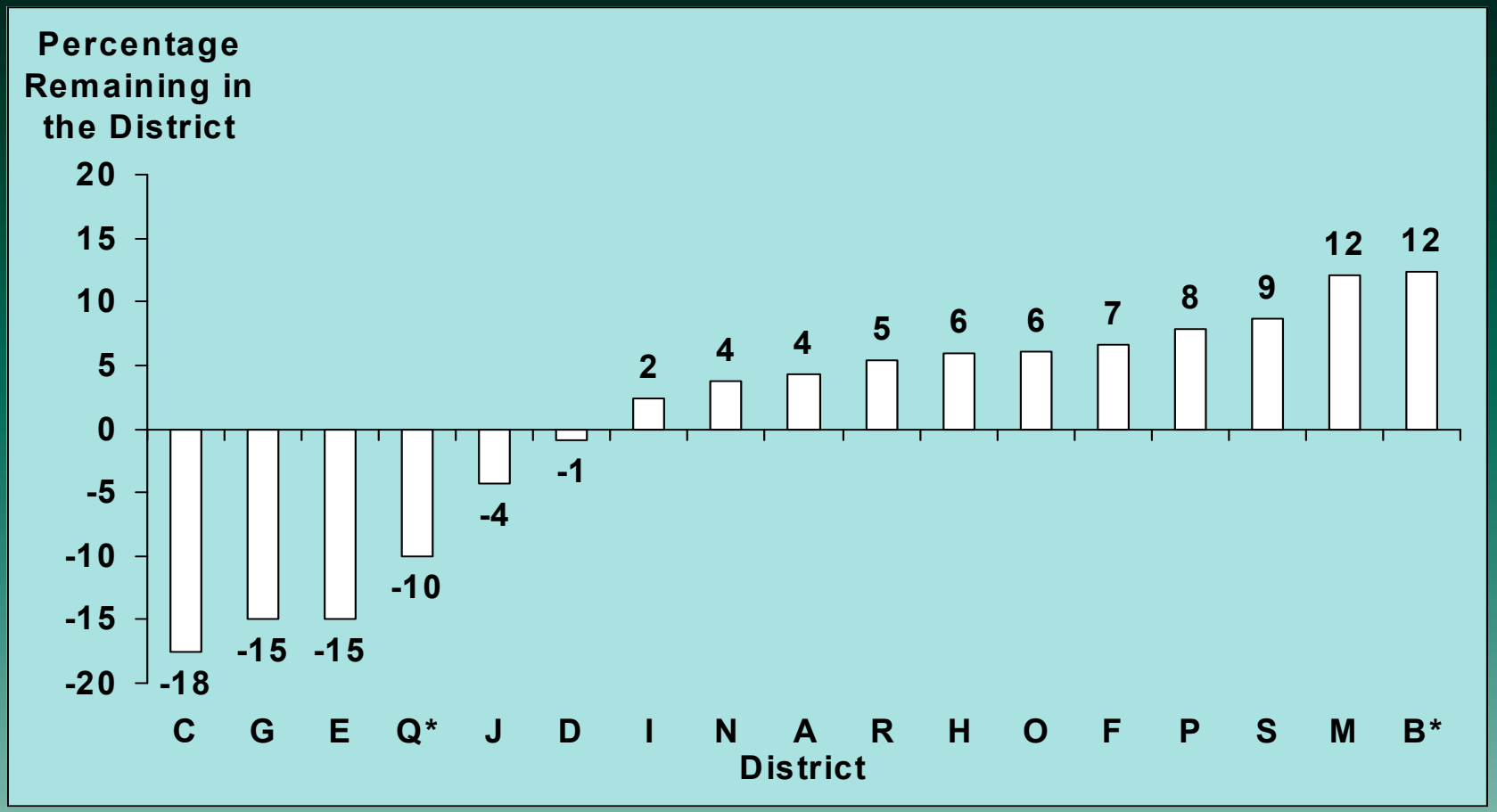
Impacts on Teacher Retention by District



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No Impacts on Teacher Retention

Percentage of Teachers who Remained in…	Treatment	Control	Impact
The same school	75	75	-1
The same district	86	86	0
The teaching profession	95	95	0

Treatment-control differences are not statistically significant (N = 882).

No Impacts on Characteristics of District Stayers

Teacher Characteristic	Treatment	Control	Impact
College Entrance Exam Scores (SAT combined score or equivalent)	1,000	1,009	-9
Attended Highly Selective College	29.6	27.9	1.7
Major or Minor in Education	73.5	74.0	-0.5
Student Teaching Experience (Weeks)	14.5	13.9	0.6
Highest Degree Is Master's or Doctorate	20.7	21.6	-0.9
Entered the Profession Through Traditional Four-Year Program	64.1	60.3	3.8
Certified (Regular or Probationary)	92.1	94.2	-2.1
Career Changer	14.7	13.4	1.2

Treatment-control differences are not statistically significant (N = 655).

No Positive Impacts on Characteristics of District Stayers

Outcome	Treatment	Control	Impact
Classroom Practices (Average Score on a 5-point Scale)			
Implementation of literacy lesson	2.7	2.7	0.0
Content of literacy lesson	2.4	2.4	0.0
Classroom culture	3.1	3.1	0.0
Student Achievement (Effect Size)			
Reading scores (all grades)	0.00	0.01	-0.01
Math scores (all grades)	-0.04	0.04	-0.08*

* Significantly different from zero at the 0.05 level, two-tailed test (N = 517, 221, 208)