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Academic majors of social studies teachers and student achievement in the U.S.

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HIGHLIGHTS

- Policy tends to consider a wide range of academic majors to be "in-subject" for social studies teachers.
- In turn, social studies teachers in the U.S. have varying academic preparation.
- Associations between student achievement and the academic majors of their teachers were estimated.
- Findings were null when aggregating all social studies related majors of students' teachers.
- However, when disaggregating these majors, significant relationships (positive and negative) were identified.

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ABSTRACT

The education of social studies teachers has been understudied at a large scale, relative to other subject areas. This study estimated whether the undergraduate and/or graduate majors of social studies teachers are associated with student achievement in civics, U.S. history, and geography. Broad categorizations of social studies-related majors were not associated with student achievement. However, a graduate major in political science for students' teachers was positively and significantly associated with student achievement in civics, and an undergraduate major in geography/geography education was negatively associated with student achievement in civics and U.S. history. Implications for policy and research are discussed.

Extensive evidence demonstrates that teachers make significant impacts on student achievement in mathematics, reading, and science (e.g., Aaronson, Barrow, & Sander, 2007; Brophy, 1986; Konstantopoulos & Chung, 2011; Nye, Konstantopoulos, & Hedges, 2004; Rockoff, 2004). While there are debates in the research community as to *how* teachers influence student achievement, prior research suggests that subject matter preparation is important, at least in particular grade levels and school subjects (e.g., Goldhaber & Brewer, 1997; Monk, 1994).

However, relatively little large scale research has focused on the preparation of social studies teachers and its role in promoting student achievement. In particular, no prior research has individually considered the multiple disciplines within social studies education (e.g., history, civics, and geography) and the wide ranging academic backgrounds of social studies teachers in the U.S. Teacher education policy is an important lever for ensuring that those entering the classroom are prepared to teach (Darling-Hammond, 2000; National Research Council, 2010), but very little research exists, specific to social studies education, to inform such policies. Therefore, evaluating the extent that the academic preparation of social studies teachers is related to student outcomes is crucial.

In this study, I draw on data from the 2014 administration of the National Assessment of Educational Progress (NAEP) and focus on the following research question:

> *To what extent are the academic majors of social studies teachers associated with eighth-grade student achievement in civics, U.S. history, and geography?*

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1. Teacher education and teacher knowledge

Shulman's (1986) influential work suggested that the development of teacher knowledge is a central goal of teacher education. With the successful development of content knowledge, pedagogical content knowledge, and curricular knowledge, teachers are equipped to effectively teach the curriculum and make appropriate instructional decisions, impacting student learning in the classroom (Shulman, 1986). However, as Gudmundsdottir and Shulman (1987) highlight, social studies teachers in the U.S. have varying opportunities for developing knowledge, due to their varying academic/disciplinary backgrounds. Additional qualitative evidence also suggests that social studies teachers vary in their approaches to teaching content in ways that reflect their disciplinary knowledge and training (Wilson & Wineburg, 1988).

In this study, I consider social studies teachers' academic majors as a proxy for teacher knowledge. By conditioning on other variables likely to correlate with teacher knowledge (e.g., years of experience and whether a teacher is certified by the National Board for Professional Teaching Standards) (Berliner, 2001; Gitomer & Zisk, 2015), I attempt to isolate the contribution of academic preparation to student achievement, as best one can within a descriptive study. I hypothesize that academic preparation aligned to individual disciplinary assessments within social studies (i.e., civics/government, U.S. history, and geography) will be positively associated with student achievement in these specific assessments. Additionally, I anticipate that majors not aligned to individual assessments and majors that are general/broad in scope will not be associated with student achievement due to a potential lack of opportunities for developing knowledge specific to the discipline assessed.

2. Social studies teacher education

Consideration of the academic background of social studies teachers presents a unique context. Middle grade social studies teachers, in particular, can come from quite different backgrounds, ranging from subject-specific to generalist education backgrounds (Conklin, 2009, 2012). Complicating matters further, the terms subject-specific or in-subject in social studies often have a very broad definition. As Dee and Cohodes (2008, p. 11) point out, "a social studies teacher with a degree in sociology or economics may technically be in field but have relatively little proficiency in history … [and] … regulations of teacher credentials do not typically make such fine-grained distinctions." For this reason, among other potential explanations, the minimal existing large-scale research focused on the academic preparation of social studies teachers has tended to use these broad definitions of in-subject when estimating the relationship to student achievement.

3. Social studies teacher education and student achievement

The earliest large-scale study on this topic, to my knowledge, utilized data from the National Education Longitudinal Study of 1988 (NELS:88). Goldhaber and Brewer (1996) investigated the relationships between in-subject certification and in-subject degrees for teachers and student achievement in mathematics, science, history, and English in tenth grade. Conditional on the available characteristics of students (including eighth grade achievement), teachers, classrooms, and schools, the authors found that in-subject certification had a positive impact on student achievement in mathematics, and in-subject degrees had a positive effect on student achievement in mathematics and science. However, the authors found no evidence that an in-subject degree or in-subject certification had an effect on student achievement in English or history.

About a decade later, Dee and Cohodes (2008) also analyzed NELS:88 data with a similar line of inquiry. The authors chose to look at eighth grade, the grade level of focus in this current study, to utilize a unique feature in the data: assessment outcomes in two subjects for each student and data on their teachers in each subject. Using a matched-pairs analysis to eliminate bias due to non-random sorting of students to teachers (and also including student and school fixed effects as well as other controls), the authors found that in-subject certification had a positive effect on test scores in mathematics and social studies, but not English or science. The contradictory findings between this study and Goldhaber and Brewer (1996) could be due to the different grade levels, different assessments (history in tenth grade versus a broader social studies assessment in eighth grade including history, citizenship, and geography) and/or the different methodological approaches.

Researchers have also used the Civic Education Study of 1999 (CivED) to investigate the importance of teachers' training for student achievement outcomes in civics. Torney-Purta, Richardson, and Barber (2005) estimated a two-level model (students nested in teachers/classrooms/schools) using the nationally representative U.S. data to estimate the relationship between teachers having a civics-related degree and/or in-service training in civic education and ninth-grade student achievement in civics. They controlled for books in the home at both the within level and between levels. Relative to students whose teachers had neither a civics-related degree nor in-service training, the authors reported the following: no significant difference in student achievement for students whose teachers had only a civics-related degree; a significant positive difference for students whose teachers had in-service training only; and an additional significant positive difference for students whose teachers had both.

Recent research specifically focused on eighth-grade U.S. history has also attempted to identify whether the academic preparation of social studies teachers is associated with student achievement. In addition to other foci in the paper, Fitchett and Heafner (2018) estimated two-level models (students nested within teachers) to determine the extent that a history major/minor or a secondary education major/minor was associated with student achievement on the 2010 NAEP U.S. history assessment, conditional on various student and teacher background variables. The authors reported that a history major/minor for teachers was not significantly associated with student achievement while teachers having a secondary education major/minor was significantly and positively associated with student achievement.

Findings from prior research are mixed and suggest several points in need of further investigation and consideration. Most importantly, much of the prior research used a broad definition for an in-subject academic major in social studies or civic education. Doing so makes sense for policy implications, as any related subject would often qualify as in-subject for purposes of teacher licensure and certification in the U.S. However, analyzing the extent that teachers' academic training in specific areas is related to student assessment outcomes in different social studies disciplines is an important empirical topic, as well.

To my knowledge, no research exists that analyzes the relationship between the varying academic majors of social studies teachers and the achievement of their students on either a comprehensive social studies assessment or assessment of individual disciplines within social studies. Additionally, data used in most of these prior studies is quite dated, from 20 to 30 years old at the time of this current study, with the exception of Fitchett and Heafner (2018), which focused on U.S. history only. Finally, only the study using CivED included private school students, which

make up a substantial proportion of students in U.S. schools.[1] I begin to address these gaps in this study. I also discuss further methodological considerations in later sections that were not always addressed in prior studies, namely school-level confounders and appropriate model estimation with NAEP data.

4. Data

The National Assessment of Educational Progress (NAEP), also commonly referred to as The Nation's Report Card, is the only ongoing, nationally representative assessment of what students in the United States know and can do in a range of subject areas, including social studies subjects/disciplines. This study utilizes the 2014 assessments of eighth graders in civics, U.S. history, and geography as well as the surveys of the students, their teachers, and their administrators, all of which were administered toward the end of the school year.

NAEP uses a complex, multistage sampling design to construct nationally representative samples of students and schools. The 2014 NAEP was a national-only assessment year, in contrast with state assessment years. The target population included all students in public and private schools enrolled in eighth grade at the time of assessment (National Center for Education Statistics, 2018). For national-only assessment years, the first stage of sampling involves selecting between 50 and 100 geographic primary sampling units (PSUs), each containing one or more counties within state borders (National Center for Education Statistics, 2018). Public and private schools were then selected from PSUs, with probability proportional to a measure of size based on enrollment (National Center for Education Statistics, 2018). Samples of eighth-grade students (not whole classes) were drawn from each school and assigned to complete one of the three assessments: civics, U.S. history, or geography (National Center for Education Statistics, 2018).

In this study, I only considered students who were eligible to be assessed, had a teacher who responded to the survey, and a teacher who reported giving instruction in the subject assessed. Teachers were not directly sampled, and thus teacher sampling weights were not computed. Rather, the appropriate teachers were surveyed and linked to students based on the subject assessed. As such, all teacher variables are treated as characteristics of students in this study. The analytic samples are as follows: the civics sample included 6410 students from 340 schools, the U.S. history sample included 8180 students from 370 schools, and the geography sample included 5620 students from 350 schools. These sample sizes and additional reporting of sample sizes are rounded to the nearest ten, per restricted-use license guidelines (National Center for Education Statistics, 2018).

4.1. Student achievement in civics, U.S. history, and geography

The National Assessment Governing Board oversees the development of assessment frameworks for each NAEP assessment. This process incorporates input from a range of stakeholders including content experts, school administrators, policymakers, teachers and parents. Subcontractors included the Council of Chief State School Officers, the American Historical Association, American Institutes for Research, the National Council for History Education, the Center for Civic Education, and the National Council for the Social Studies. These frameworks guided the development of assessment items (including multiple choice and both short and extended constructed response), which are generated by educators and curriculum experts for each assessment year, a longstanding contract with Educational Testing Service.

The current NAEP civics framework was originally developed in 1998 and draws heavily on the *National Standards for Civics and Government*, published in 1994 by the Center for Civic Education (Center for Civic Education, 1994; The National Assessment Governing Board, 2014a). The civics assessment was intended to measure civic knowledge, intellectual and participatory skills, and civic dispositions. The content areas included politics and government, foundations of the U.S. political system, the U.S. constitution, world affairs, and the roles of citizens. The intended cognitive domains for the civics assessment included identifying/describing, explaining/analyzing, and evaluate/take/defend.

The NAEP U.S. history framework was originally developed in 1991-92 with minor updates in 2003. While there is no mention of specific standards used in the development of the assessment framework, the original project committees included “a broad range of historians, educators, policymakers, business representatives, and other interested citizens” (The National Assessment Governing Board, 2014c, p. v). The U.S. history assessment was intended to assess two ways of knowing and thinking about history, a) historical knowledge and perspective and b) historical analysis and interpretation. The content of the U.S. history assessment was organized around four historical themes: continuity and change in U.S. democracy, interaction of peoples and cultures, technological and economic changes, and the changing world role of the U.S.

The current NAEP geography framework was originally developed in 1994, predating the release of the first edition of the *National Geography Standards* (Geography Education Standards Project, 1994). However, the NAEP geography framework and these standards share common goals and expectations for students (The National Assessment Governing Board, 2014b). The geography assessment was organized around three content areas: space and place, environment and society, and spatial dynamics and connections. The assessment was designed for students to answer questions by performing the following cognitive processes: knowing, understanding, and applying.

Each student completed only a fraction of the items from the assessment they were assigned due to time constraints. NAEP contractors estimated twenty plausible values for each student's test score using a combination of measurement and population-structure models (Mislevy, Johnson, & Muraki, 1992). In other words, both students' responses to the items they completed as well as other available data were used to generate 20 plausible test scores for each student, which can then be used in analyses, similar to applications for dealing with missing data (Schafer, 1999).

4.2. Student and school background

In addition to students' scores on the assessment they were assigned, this study also utilized survey data from the students, their teachers, and their school administrators. Table 1 presents sample summary statistics of student and school variables, used as controls in this study. All means/proportions are at the student level and are unweighted. Binary variables describe students' race, ethnicity, Individualized Education Program (IEP) status, whether the student was classified as having limited English proficiency (LEP), and the student's reported gender. Additionally, an ordinal variable describes the number of books in the home reported by the student, a proxy for socioeconomic status. School characteristics presented in Table 1 include binary items that describe the school sector, the locale/urbanicity, and the census region.

[1] Since the focus of this current paper is on the academic majors of students' teachers and not on policies specific to public school teachers (i.e., certification or licensure), it is appropriate to include these students in the analyses.

Table 1
Sample summary statistics of student and school variables.

	Civics	U.S. history	Geography
Student Variables			
Female	0.498	0.495	0.493
White, not Hispanic	0.479	0.456	0.488
African American, not Hispanic	0.165	0.175	0.171
Hispanic of any race	0.262	0.273	0.256
Asian American/Pacific Islander	0.066	0.067	0.058
Another race or ethnicity	0.029	0.029	0.027
Individualized Education Program (IEP)	0.100	0.108	0.110
Limited English Proficiency (LEP)	0.051	0.054	0.052
Books in the home (1–4)	2.678 (1.033)	2.683 (1.010)	2.667 (1.023)
School Variables			
Private	0.106	0.095	0.102
Charter	0.058	0.062	0.060
City	0.321	0.335	0.338
Suburb	0.365	0.371	0.350
Town	0.102	0.101	0.108
Rural	0.213	0.193	0.204
Northeast	0.174	0.169	0.157
Midwest	0.186	0.185	0.182
South	0.398	0.390	0.404
West	0.241	0.256	0.258

Note. Statistics presented are not weighted and reflect the samples. The unit of observation is students, given the sampling design and approach used in this study. The standard deviation for books in the home is in parentheses. All other means are proportions.

4.3. Teacher background

This study focuses primarily on the academic majors of students' teachers. These variables are presented in Table 2, and again, all means/proportions are at the student level due to the sampling design and are unweighted. Teachers were asked if they had an undergraduate or graduate major in any of the following areas: history/history education, geography/geography education, political science, general social sciences/social studies education, other social science (e.g., economics, sociology, psychology, or anthropology), or education (including secondary education). These variables are not mutually exclusive. I additionally coded two variables (one undergraduate and one graduate) equal to one if the teacher answered yes to having a major in any of the subject areas above other than education/secondary education. Coding these two variables in this way is similar to the prior research that grouped together all subject areas related to social studies and reflects what states would typically consider to be in-subject.

Also included in Table 2 are other teacher-related variables, which are used as controls in this study. Binary variables describe whether the student's teacher had a graduate degree in any field, the teacher's years of teaching experience at the elementary or secondary level (excluding student teaching), whether the student's teacher was certified through an alternative route, and whether the student's teacher was certified by the National Board for Professional Teaching Standards (an advanced voluntary form of certification).

Table 2
Sample summary statistics of teacher variables.

	Civics	U.S. History	Geography
Undergraduate major			
Any major related to social studies	0.647	0.639	0.663
History/history education	0.387	0.387	0.402
Geography/geography education	0.037	0.031	0.040
Political science	0.103	0.097	0.088
Social sciences/social studies education	0.182	0.177	0.211
Other social science	0.120	0.123	0.121
Education/secondary education	0.344	0.318	0.348
Graduate degree	0.496	0.517	0.511
Graduate major			
Any major related to social studies	0.203	0.213	0.217
History/history education	0.140	0.146	0.149
Geography/geography education	0.021	0.018	0.018
Political science	0.025	0.031	0.028
Social sciences/social studies education	0.083	0.081	0.091
Other social science	0.029	0.032	0.030
Education/secondary education	0.399	0.416	0.404
Years of teaching experience			
Less than 1 year	0.043	0.051	0.044
1–2 years	0.070	0.063	0.061
3–5 years	0.106	0.104	0.104
6–10 years	0.262	0.272	0.297
11–20 years	0.338	0.327	0.318
21 or more years	0.181	0.184	0.176
Alternative certification	0.178	0.193	0.188
NBPTS certified	0.168	0.166	0.169

Note. Statistics presented are not weighted and reflect the samples. The unit of observation is students, given the sampling design and approach used in this study. All statistics are means of binary variables, which depict proportions. Academic majors are not mutually exclusive. NBPTS = National Board for Professional Teaching Standards.

5. Analysis

Linear regression models were estimated in Mplus 8 using robust maximum likelihood (MLR), utilizing full information maximum likelihood (FIML) for handling missing data (Muthén & Muthén, 2017). The outcome modeled was each student's 20 plausible values for their NAEP score (civics, U.S. history, or geography). The focal predictors included a set of binary variables corresponding to teachers' undergraduate and graduate majors, listed in Table 2. For each sample, I estimated two models. In the first, I predicted student achievement with an indicator for majoring in any social studies-related area (undergraduate and graduate). In the second model, I disaggregated these variables by modeling individual social studies related academic majors, within the limitations of the data/survey questions. In both model specifications, I also included an indicator for whether the students' teacher had any graduate degree and indicators for having majored in education/secondary education at the undergraduate or graduate level.

In all models, I controlled for available covariates. These included all characteristics of students and schools presented in Table 1, an ordinal indicator for the number of hours of social studies instruction per week, the percentage of instruction devoted to the assessed subject, the interaction of these two variables, whether the teacher was certified through an alternative route, whether the teacher had been certified by the National Board for Professional Teaching Standards, teachers' years of experience, and cluster averages of the following student variables: African American, not Hispanic; Hispanic of any race; and books in the home. By including these covariates in the models, I attempted to reduce bias in the estimates of interest (non-random sorting of students to schools and teachers, in particular) as best one can with cross-sectional data and no prior achievement measures.

In all models, corrections to standard errors were made, and inverse probability sampling weights for students were used. Standard errors were corrected for stratification and clustering of students in geographic sampling units and schools.[2] Clustering standard errors in this way is appropriate based on the sampling design (Abadie, Athey, Imbens, & Wooldridge, 2017), and this approach is a suitable alternative to using a multilevel model (McNeish, Stapleton, & Silverman, 2017).

6. Results

All results are presented as effect sizes (i.e., standard deviation units). Since all focal predictors are binary, a one unit increase corresponds to a student's teacher having the relevant characteristic. Reference groups for each variable are students whose teachers do not have the relevant characteristic. This is true across all variables given the academic majors are not mutually exclusive. All results presented are conditional on all of the control variables included, as outlined in the previous section.

There are several components of the results in Table 3 worth highlighting. In model 1 in each sample, I categorized teachers' academic majors as has been done in most of the prior research, using a broad definition of what constitutes a major related to social studies education. As the results for model 1 in each sample demonstrate, categorizing students whose teachers had any social studies related major (separately for undergraduate and graduate education) resulted in null estimates across all assessments.

After disaggregating these two variables into more specific types of majors, interesting findings were uncovered. Conditional on all other covariates, students whose teachers reported a graduate major in political science scored approximately a quarter of a standard deviation higher, on average, on NAEP civics. Additionally, students whose teachers reported an undergraduate major in geography/geography education scored about 19% of a standard deviation lower on NAEP civics and about 22% of a standard deviation lower on NAEP U.S. history.

Other findings are also worth reporting. Students' teachers simply having a graduate degree in any field was not associated student achievement. Furthermore, no other majors at the undergraduate or graduate level had a significant relationship to student achievement in any discipline including education/secondary education majors. No significant relationships were estimated between academic major of students' teachers and student performance on NAEP geography. I discuss the significance and implications of these results in the next section.

[2] In Mplus 8, this was coded as type = complex, strata = repgrp1, and cluster = schid (Muthén & Muthén, 2017).

7. Discussion

The purpose of this study was to estimate the relationship between the academic majors of social studies teachers and student achievement on three disciplinary assessments. The limited prior research was mixed regarding the academic background of social studies teachers and student achievement outcomes in social studies education (Dee & Cohodes, 2008; Fitchett & Heafner, 2018; Goldhaber & Brewer, 1996; Torney-Purta et al., 2005). The lack of clarity in prior research concerned with this topic was potentially due to the broad set of majors that were typically considered to be relevant to the subject assessed, varying assessments (10th grade history, eighth-grade social studies, eighth-grade U.S. history, and an international comparative civics assessment), and/or additional methodological decisions.

In this study, I considered both a broad categorization of social studies related majors as well as individual academic majors and their relationship to student achievement on three disciplinary assessments. Conditional on important covariates, I found that having any social studies related major was not significantly associated with student achievement on any of the three assessments. However, a teacher having a graduate major in political science was positively associated with student achievement in civics, and a teacher having an undergraduate major in geography/geography education was negatively associated with student achievement in both civics and U.S. history.

To restate my hypotheses, I expected that a) academic majors aligned to the specific student assessments would be positively associated with student achievement and b) broad/general academic majors would not be associated with student achievement on the individual disciplinary assessments. The findings of this study supported my hypotheses to an extent, but not completely. A graduate major in political science was positively associated with student achievement in civics, which supports my first hypothesis. I did not expect to estimate negative relationships, but the findings regarding undergraduate majors in geography also support the logic of my hypotheses (that aligned teacher preparation is important for student achievement). More general/broad majors, not specifically aligned to the individual assessments, were not associated with student achievement, which supports my second hypothesis. However, I expected student achievement in U.S. history and geography to be higher for students whose teachers had an aligned academic background, which was not found in this study. It is also unclear why there are differences across undergraduate versus graduate majors. Future research could explore both of these issues, which I discuss in a later section.

Although more research is needed in this line of inquiry, these findings shed light on the potential importance of aligned subject matter preparation for raising student achievement in particular disciplines and the potential negative impact of a misaligned academic background of teachers. As has been suggested in prior qualitative studies, social studies teachers come from varying academic/disciplinary backgrounds resulting in varying disciplinary knowledge, and they tend to approach teaching the content in ways that reflect their prior knowledge (Gudmundsdottir & Shulman, 1987; Wilson & Wineburg, 1988). Yet in policy and practice, teachers with a range of backgrounds are considered as equally prepared to begin teaching the broad subject area of social studies.

Pre-service teacher education is an important policy lever and a crucial time for the development of the teacher workforce. Colleges of education, other providers of teacher preparation, and policymakers may want to consider more fully how varying subject matter preparation for future social studies teachers may lead to varying student achievement in individual social studies disciplines. Although not conclusive, the findings in this study raise

Table 3
Regression results predicting student achievement with academic majors of teachers.

	Civics		U.S. History		Geography	
	(1)	(2)	(1)	(2)	(1)	(2)
Undergraduate major						
Any major related to social studies	0.041	–	0.020	–	0.009	–
	(0.041)	–	(0.033)	–	(0.037)	–
History/history education	–	0.055	–	0.017	–	−0.054
	–	(0.037)	–	(0.036)	–	(0.039)
Geography/geography education	–	−0.189*	–	−0.217**	–	−0.002
	–	(0.082)	–	(0.083)	–	(0.099)
Political science	–	0.013	–	0.063	–	0.076
	–	(0.057)	–	(0.062)	–	(0.060)
Social sciences/social studies education	–	0.024	–	0.013	–	0.035
	–	(0.046)	–	(0.042)	–	(0.053)
Other social science	–	0.039	–	−0.026	–	−0.070
	–	(0.052)	–	(0.043)	–	(0.057)
Education/secondary education	0.024	0.016	0.053	0.049	0.033	0.022
	(0.036)	(0.037)	(0.036)	(0.036)	(0.038)	(0.036)
Graduate degree	−0.012	−0.023	−0.040	−0.032	−0.030	−0.021
	(0.042)	(0.041)	(0.039)	(0.039)	(0.044)	(0.045)
Graduate major						
Any major related to social studies	0.057	–	0.052	–	0.091	–
	(0.043)	–	(0.044)	–	(0.059)	–
History/history education	–	−0.019	–	0.020	–	0.103
	–	(0.048)	–	(0.056)	–	(0.081)
Geography/geography education	–	−0.112	–	0.110	–	−0.075
	–	(0.123)	–	(0.100)	–	(0.134)
Political science	–	0.251*	–	−0.021	–	0.088
	–	(0.105)	–	(0.088)	–	(0.110)
Social sciences/social studies education	–	0.106	–	0.050	–	0.051
	–	(0.064)	–	(0.081)	–	(0.095)
Other social science	–	−0.028	–	−0.052	–	−0.110
	–	(0.095)	–	(0.085)	–	(0.105)
Education/secondary education	0.035	0.034	0.019	0.006	0.037	0.023
	(0.041)	(0.041)	(0.037)	(0.037)	(0.044)	(0.042)
Unweighted N	6370	6370	8130	8130	5580	5580
R-squared	0.393	0.397	0.391	0.392	0.397	0.401

Note. **p < .01,*p < .05. Control variables included all characteristics of students and schools presented in Table 1, an ordinal indicator for the number of hours of social studies instruction per week, the percentage of instruction devoted to the assessed subject, the interaction of these two variables, whether the teacher was certified through an alternative route, whether the teacher had been certified by the National Board for Professional Teaching Standards, teachers' years of experience, and cluster averages of the following student variables: African American, not Hispanic; Hispanic of any race; and books in the home. Robust standard errors (in parentheses) were corrected for stratification and clustering, and inverse probability weights were used in estimation, as described in the analysis section.

skepticism as to whether broad categorizations of what counts as "in-subject" in social studies is sufficient when considering impacts on student achievement in the individual underlying disciplines of this school subject.

7.1. Limitations and recommendations for future research

There were two primary groups of limitations in this study. Perhaps the most serious of these limitations was the lack of prior student achievement measures. Although steps were taken in this study to address potential bias in estimates, the findings should be considered correlational, not causal. Future research should seek to replicate the descriptive findings in this study with data and methods that allow for causal claims. Nonetheless, large-scale quantitative research in social studies education is quite limited, particularly studies that consider multiple disciplinary assessments and the line of inquiry in this study.

Second, there are some potential measurement concerns worth highlighting. For example, a recent paper investigated and questioned whether the NAEP U.S. history assessment measured historical thinking processes as was intended (Smith, 2017), albeit focusing only on the multiple-choice items and not the constructed-response items. While the NAEP U.S. history, civics, and geography assessments are among the best available assessments in their respective areas, future research could seek to test the hypotheses in this study with other assessments of student knowledge and skills. Additionally, it would be reasonable to take issue with how several of the NAEP survey items were constructed (i.e., combining history and history education or geography and geography education). Many historians likely perceive traditional disciplinary coursework very differently from history education coursework. The same could be said for geography. Future research in similar lines of inquiry could develop survey items that allow for further disaggregation of academic majors and/or collecting data on numbers of courses or content topics covered in each relevant category of general social studies, disciplinary, and pedagogy coursework.

In addition to addressing the above limitations in future research, the field would benefit from advances in psychometric measurement of teacher knowledge, teaching practices, and the relationships between these constructs and student achievement in social studies, as has been done in mathematics (e.g., Hill et al.,

2008; Hill, Rowan, & Ball, 2005). Without question, social studies is a far more complex and contested space than mathematics, with extensive disagreement around its definition and purpose (see Barton & Avery, 2016; Evans, 2004; Finn, 2003; Powell, 2018; Thornton, 2017). However, this is not to say that further research advances cannot be made alongside further discussion and debate about what constitutes teacher knowledge and practice in the social studies and its underlying disciplines. One initial point of departure could be to make use of the underutilized social studies teacher licensure data available in the U.S., which focuses on teachers' content knowledge in social studies and its underlying disciplines. From there, the field can make further progress on theorizing and measuring pedagogical content knowledge and effective teaching practices in social studies classrooms.

Finally, this study focused at the eighth-grade level. Prior to high school, students tend to be in integrated, interdisciplinary social studies courses, and in high school, students tend to be in standalone disciplinary courses (Barton & Avery, 2016; Education Commission of the States, 2016; Halvorsen, 2013). Future research could seek to test this study's hypotheses at the high school grade level to see if the findings presented here are replicated. Further research based on the ambitious agenda presented above will be of enormous benefit to the field.

8. Conclusion

This study provided evidence of the potential importance of subject/discipline-specific preparation for teachers and the potential negative impact of misaligned preparation, in terms of standardized student achievement in three social studies disciplines. Consideration of student achievement in social studies and its underlying disciplines and the relationship to educational inputs is of vital importance and needs to be brought to the forefront of educational policy discussions. The academic background and preparation of social studies teachers is one area among many in need of further development within social studies scholarship.

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