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Contextual Factors Associated with the Use of Corporal Punishment in U.S. Public Schools

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1. Introduction

Nineteen states in the U.S. legally permit public school officials to administer corporal punishment to their students; these states are Alabama, Arizona, Arkansas, Colorado, Florida, Georgia, Idaho, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Wyoming (Gershoff et al., 2015). An additional 3 states (Maine, New Hampshire, and South Dakota) do not explicitly allow or ban school corporal punishment (U.S. Department of Education, 2016). For the past several years, between 160,000 and 200,000 students were subjected to school corporal punishment (SCP) each year (U.S. Department of Education Office of Civil Rights, 2012), with SCP typically involving a teacher or administrator spanking a child with a wooden paddle (Gershoff et al., 2015). Although there is relatively little research on the effects of SCP, a large body of research on parent use of corporal punishment has found negative associations with children's social, behavior, and mental well-being (Gershoff & Grogan-Kaylor 2016). In addition, numerous individual accounts of SCP have identified physical injury to children, ranging from bruising to broken bones (Gershoff et al., 2015).

Most states have abolished SCP, and within states where it is legal, many schools and districts nevertheless opt not to use it (Gershoff & Font, 2016). In past years, SCP received little attention from researchers or government agencies, particularly in comparison to other forms of school discipline such as suspensions and expulsions (Losen, Hewitt, & Toldson, 2014; Smith & Harper, 2015; U.S. Department of Justice and U.S. Department of Education, 2014; U.S. Department of Education Office for Civil Rights, 2015a). Yet, two recent research studies (Gershoff, Purtell, & Holas, 2015; Gershoff & Font, 2016) have drawn attention to the continued use of SCP and disparities in use. In November 2016, then-Secretary of Education Dr. John King released a formal statement encouraging states to abolish the use of SCP (King, 2016), joining a number of educational and medical

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organizations that have released statements in opposition to SCP (e.g., American Academy of Pediatrics, 1984; American Medical Association, 1985; American Psychological Association, 1975; National Association of Elementary School Principals, 2013; National Association of State Departments of Education, 2015). Understanding why some U.S. public schools continue to use SCP despite concerns raised about it is the key goal of the present paper.

Given that the practice of school corporal punishment dates back to Colonial America (Garrison, 2007; Ryan, 1994), it is surprising how little is known about the school and community contexts in which it is practiced. There is widespread diversity in SCP use both within and across states (Gershoff & Font, 2016), and thus, to provide a generalizable picture of the contexts in which SCP is used, multi-state school-level data is optimal. As a result of limited available data, the few studies examining correlates of SCP use have relied on state-level data (Gershoff et al., 2015; Owen & Wagner, 2006) or on data from a single state (Kentucky: McClure & May, 2008) or single school district (Central Florida district: Shaw & Braden, 1990; South Florida district: McFadden et al., 1992). The only national study with school-level data to examine multiple levels of influence (e.g., state, county, school) had an insufficient sample size to be generalizable (362 schools: Han, 2011).

In this study, we linked data from a universal survey of U.S. public schools with other national data sources (the U.S. Census, Association of Statisticians of American Religious Bodies, U.S. Department of Agriculture; USA Today) to examine the characteristics of schools and counties where SCP is practiced. Specifically, we focus on three sets of factors that may distinguish the communities that continue to use SCP: cultural characteristics, socioeconomic characteristics, and racial composition. This is the first-ever examination of SCP using universal data from the population of public schools in the U.S.

2. Background

2.1. The Geography of SCP Legality and Use

Of the 19 states that allow SCP, 12 (63%) are in the South (as defined by the U.S. Census Bureau, 2014). Within states that use SCP, it appears to be more prevalent in rural areas (McClure & May, 2008). Although defined by their geographic location, “Southern” and “rural” are not just attributes of a place; rather, each connotes a culture or way of life. Both Southern and rural cultures have been described as emphasizing tradition, order, and respect for authority (Flynn, 1994; Weisheit, 1993). In addition, there are several measurable attributes that distinguish the South and rural areas from their regional or urban counterparts, and that could be relevant to understanding the use of SCP. Specifically, both the South and rural areas tend to have more conservative religious and political affiliations (Pew Research Center, 2015; USA Today, 2008) and lower median incomes and education levels (U.S. Census Bureau, 2014). Both rural and Southern areas have been characterized as less tolerant of individual differences than non-Southern and metro areas, respectively (Ellison & Musick, 1993; Weisheit, 1993). Given their similarities, it is not clear whether Southernness and rurality would each independently relate to SCP use; for example, we may expect SCP use to be most widely used in rural areas with large Southern-born populations. Below, we

consider the extent to which the characteristics commonly attributed to Southern or rural cultures may relate to the use of SCP.

2.2. Religious Affiliation

Religious affiliations influence individual views on the ways in which society should respond to misbehavior in numerous contexts. Evangelical Protestantism is a prevalent religious affiliation in the South (Pew Research Center, 2016), one which is characterized by an adherence to Biblical literalism (Hoffman et al., 2017). It is sometimes conflated with, or categorized under, fundamentalist or conservative Protestantism (Smith, 1990; Ellison & Sherkat, 1993; Grasmick & McGill, 1994), though this is controversial given that Evangelical Protestants are not universally conservative (Emerson & Hartman, 2006). Nevertheless, Biblical literalists are more likely than others to believe that the Bible endorses harsh punishments for children; they are also more apt to attribute deviant behavior to the sinfulness or weakness of the individual rather than to environmental or situational factors (Grasmick & McGill, 1994). Studies indicate that adherence to a sect of Christianity that promotes Biblical literalism, including Evangelical Protestantism, is associated with more supportive attitudes toward harsh punishments of children, including school corporal punishment (Grasmick, Morgan, & Kennedy, 1992), corporal punishment of children by parents (Ellison & Sherkat, 1993; Ellison, Bartkowski, & Segal, 1996; Gershoff, Miller, & Holden, 1999; Grogan-Kaylor & Otis, 2007; Ellison & Bradshaw, 2009), and harsh punishment for juvenile crime (Grasmick & McGill, 1994). Yet, in the two extant studies of SCP use and religious affiliation, findings were divergent. In a state-level study, the percent of Evangelical Protestants was associated with the legality and higher prevalence of school corporal punishment (Owen & Wagner, 2006), whereas in a state-wide study of Kentucky counties, no association was found between religious affiliation and either use or prevalence (McClure & May, 2008). Despite these divergent findings, the larger body of research on parental use of corporal punishment and on punitive attitudes suggests that Evangelical Protestants would be more likely to support SCP, and thus areas where they are heavily concentrated may exhibit higher rates of use.

2.3. Political Affiliation

SCP is consistent with a conservative ideology. Political conservatism prioritizes obedience and respect for authority over individualism and creativity among children (Lakoff, 2010) and is associated with authoritarian attitudes that favor social control (Duckitt, 2009). Accordingly, individual conservatism is associated with higher support for corporal punishment by parents (Ellison & Bradshaw, 2009) and for harsh sentencing of juvenile offenders (Scott et al., 2006). Moreover, political conservatism has been linked with resistance to change (Jost et al., 2007), which may explain the persistence of SCP in specific areas despite the practice being widely abandoned elsewhere.

Although an imperfect proxy for conservative ideologies, an examination of political party identification or voting can nevertheless be instructive. Only one study to date has examined associations between political conservatism and use of SCP. In a study of counties in Kentucky, McClure and May (2008) examined political party affiliation using voter registration rates for Democrats and Republicans, but did not find a significant association

with the use or prevalence of SCP. Yet, a map of state SCP bans tracks closely to an electoral map of the 2012 presidential race: of the 25 states won by the Republican Party candidate in that election, 17 allow SCP, compared with 2 of the 25 states won by the Democratic Party candidate (The New York Times, 2012). We thus thought it worthwhile to consider political affiliation as a predictor of SCP.

2.4. Socioeconomic Attributes

Parents who are of low socioeconomic status express more positive attitudes toward parental corporal punishment (Button, 2008; Douglas, 2006). States where corporal punishment is legal, and where it is most prevalent, tend to have higher poverty and lower education rates than states where it is illegal or less widely used (Gershoff et al., 2015). In addition, McClure and May (2008) found an inverse association between county median household income and county-level use of SCP in Kentucky. Heightened support for parental use of corporal punishment among low-income parents may reflect their constrained options for directing children's behavior through incentives (Weinberg, 2001). Parents with a constrained view of the tools available to modify children's behavior may then extend that view to misbehavior in school.

2.5. Racial Composition

There are a few ways in which racial composition may influence schools' decision to use corporal punishment. First, the relative size of a racial or ethnic group should relate to its influence on the practices of schools or districts. Relative to Whites, Black parents hold more positive attitudes about corporal punishment (Taylor, Hamvas, & Paris, 2011; Taylor et al., 2011) and use it more frequently (Gershoff, Lansford, Sexton, Davis-Kean, & Sameroff, 2012). Because school policies reflect the community in which they are placed, schools may be more apt to use corporal punishment in areas with high numbers of Black residents. Yet, given that Black students may receive the brunt of such harsh punishment (Gershoff & Font, 2016), community members in majority-minority areas may use their influence to eliminate the practice. Moreover, even in areas where parents mostly approve of corporal punishment, they may be skeptical of school personnel exercising physical force against their children.

The racial composition of the student body may be associated with a higher rate of SCP among schools that opt to use it. That is, because Black students are at higher risk of all forms of discipline (American Psychological Association Zero Tolerance Task Force, 2008; Eitle & Eitle, 2004; U.S. Department of Education Office of Civil Rights, 2012), schools with more Black students would have a higher number of students being disciplined.

Prior research on this topic is both limited and inconclusive. States with a higher percentage of Black residents are more likely to use SCP (Gershoff et al., 2015), and schools with a higher percentage of racial and ethnic minority students have a higher probability of SCP use (Han, 2011). In contrast, McClure and May (2008) found that counties in Kentucky with a higher percentage of White residents were more likely to use SCP. Such divergent findings are not entirely surprising given these studies' dissimilarities in levels of analysis (state, school, or county, respectively), use of covariates, and other study characteristics (e.g., location, time).

2.6. Factors Associated with Racial Disparities in SCP

In addition to understanding what predicts overall rates of SCP within school districts, it is also important to understand what accounts for disparate rates of SCP by student race. The disproportionate use of SCP on Black students as compared with White students is well-established (Gershoff et al., 2015; Gregory, 1995; Gregory, 1997). Yet these disparities are not uniform across districts where SCP is used. A recent analysis of district-level racial disparities in SCP use within states that legally allow it (Gershoff & Font, 2016) found wide within-state variation. Within some states (Indiana, Missouri, North Carolina), most school districts that use SCP use it at equal rates for Black and White students, whereas in other states (Alabama, Mississippi), Black students are at least 50% more likely than White students to be subject to SCP in a majority of districts. Particularly striking was the finding that in 1 in 5 districts in Alabama and Mississippi, Black students are more than *5 times* as likely to be subject to SCP as their White peers (Gershoff & Font, 2016). Understanding why such disparities exist is the first step toward eliminating them.

There have been no school- or district-level studies of factors associated with racial disparities in SCP since the early 1990s. Two studies (Shaw & Braden, 1990; McFadden et al., 1992a, 1992b). examined individual-level receipt of corporal punishment within a single school district. They found that race, gender, and disability status were predictive of school corporal punishment, net of frequency and severity of disciplinary infraction. An additional study using state-level data found that states with lower levels of social capital had more disproportionate use of SCP against Black students (Owen, 2005).

2.7. The Current Study

SCP is a disciplinary practice that is still used primarily in the Southern United States but is not used universally across districts in states where it is legally permitted. Given concerns about the potential harms of SCP for student behavior, mental health, and achievement and about evidence of its disparate use with Black and White students, our goal in this study was to identify which cultural, socioeconomic, and racial composition factors predict any use of SCP, prevalence of SCP, and disparate use of SCP by student race group. We did so using data from a universal survey of all public schools in the United States, merged with other national data available at the county level. Measures that precisely map onto the population served by a given school would be ideal; however, socio-cultural variables were primarily available at the county level, rather than the school or district level.

2. Method

3.1. Data

We used data from the U.S. Department of Education Civil Rights Data Collection (CRDC) from the school year 2011–2012. This was a mandatory and universal survey of all U.S. public schools that was completed by individual school administrators, along with a shorter set of questions completed by a representative for the district. In order to address our research questions, we restricted our analyses to schools in the 19 states that legally allow SCP (AL, AR, AZ, CO, FL, GA, ID, IN, KS, KY, LA, MO, MS, NC, OK, SC, TN, TX, and WY; $N = 38,781$ schools). All of these states included schools that reported use of corporal

punishment, though some states had a very small proportion of schools that reported SCP (namely, SCP was reported in less than 2% of schools in CO, ID, KS, NC, SC, and WY). We then excluded schools that were contained within hospitals, juvenile detention centers, prisons, or treatment centers, as well as adult education and online schools. This left 38,020 schools. These school-level data were merged with county-level data. Although some measures were available at a smaller unit of geography, the majority were not, and thus to maintain consistency across measures, county was used as the primary geographic unit for data-linking. The county-level measures were derived from numerous sources, as detailed below. The very few counties with missing values were excluded ($n = 17$ schools). Our final set of data consisted of 38,003 schools that were contained within 1,653 counties.

3.2. Measures

3.2.1. Use of SCP—Our primary outcomes were (a) any use of SCP and (b) prevalence of SCP. In the CRDC survey, corporal punishment was defined as “paddling, spanking, or other forms of physical punishment imposed on a student”. For any use of SCP, we created a dichotomous indicator of whether the school reported a non-zero integer value for the number of students receiving corporal punishment that year. The prevalence of SCP was measured as the number of students at a school who were paddled (with the method of analysis adjusting for differences in school enrollment).

3.2.2. Racial disparities in use of SCP—We created measures of disparities in the use of corporal punishment by student race based on rates reported in the CRDC. We calculated a ratio equal to the proportion of students who experienced SCP in one group divided by the proportion in the other group who experienced SCP. For race, we focused on the ratio of Black students to students of other races who received SCP. The focus on Black students is consistent with past work finding that Hispanic students did not experience higher rates of SCP than White or Black students (Gershoff et al., 2015). Though there are potentially other races that experience disparate punishment (for example, Native American students), the population size and geographic dispersion of other racial groups was too limited to be included in our analysis. By necessity, schools that did not use corporal punishment at all, schools with only Black students, and schools with no Black students were excluded for this set of analyses.

We identified schools as having a disparity if Black students received corporal punishment at a rate two or more times greater than the reference group. However, there were some schools for which a ratio could not be calculated because either the numerator or denominator was 0. That is, some schools, despite having both groups represented and using corporal punishment, only paddled members of one group. We contend that these values indicate an extreme disparity, rather than a unique process. Thus, we wanted to incorporate those schools into our disparity measure, and counted schools that only paddled Black students with the schools with a large disparity (2 times or greater) and counted schools that only paddled non-Black students as part of the reference group.

Some schools in the CRDC had very little racial diversity or used corporal punishment on very few students. This raises a concern that ratios based on a single student or single use of

corporal punishment would unduly influence our findings. Thus, we estimated our disparity model under multiple sensitivity conditions to ascertain the consistency (or inconsistency) of results. Specifically, we examined three constraints: (1) corporal punishment was used on 1 or more students and there was at least 1 Black and 1 non-Black child enrolled; (2) corporal punishment was used on 1 or more students and there were at least 15 Black and 15 non-Black students enrolled; and (3) corporal punishment was used on at least 10 students and there were at least 15 Black and 15 non-Black students enrolled.

3.2.3. Key explanatory variables—We operationalized the **Southern culture** of a county as the percentage of residents who were born in a Southern state (U.S. Census Bureau, 2014). The percentage of Southern residents was used because Southernness is understood as a cultural, rather than solely geographic state. Although the percentage of Southern residents who are Southern-born has declined generally, declines have been uneven across and within states (Aisch, Gebeloff, & Quealy, 2014). **Rurality** was a binary measure, equal to 1 if the county was classified as “non-metro” by the U.S. Department of Agriculture (2008) and 0 otherwise. Although rurality is often also described as a cultural trait, to our knowledge there are no applicable measures of rural migration similar to those used for Southernness. We also include in our models the interaction of Southernness and rurality. We included a dichotomous measure of whether the county economy was **farming or mining** dependent (U.S. Department of Agriculture, 2004).

Evangelical Protestant affiliation was operationalized as the percentage of a county’s residents who identified an Evangelical Protestant religious affiliation (Association of Statisticians of American Religious Bodies, 2011). Protestant churches were designated in three categories: mainline Protestant, historically Black Protestant, and Evangelical (a list of denominations categorized as Evangelical Protestant can be found at <http://www.thearda.com/rcms2010/evangelical.asp>).

The percent of major party votes in the 2008 presidential election that went to the Republican candidate (county-level data from USA Today, 2008) was used as the indicator of **political conservatism**, given that Republican voters tend to have conservative political and social beliefs (Pew Research Center, 2014).

Socioeconomic variables at the county level were **percent of college graduates** (with 4-year degrees) among adults over age 25 (U.S. Census Bureau, 2011a) and **median household income** (U.S. Census, 2011b). We also included an indicator of receipt of Title I federal funds from the CRDC data (U.S. Department of Education Office of Civil Rights, 2012) to identify **schools with high proportions of students from low income families**.

Racial composition measures were at the school and county levels (U.S. Department of Education, 2012; U.S. Census Bureau, 2012). Only three racial and ethnic groups, White, Black, and Hispanic, were sufficiently large and geographically disperse to be included. We focused our examination of race at the county level on Blacks, but included indicators at the school level for percent Black and percent Hispanic. For the county level measure of percent Black, we also included a squared term to identify potential nonlinearities in its association with SCP.

3.2.4. Covariates—In addition to our key constructs, we accounted for several key school characteristics. These covariates were constructed from our primary dataset, the 2011–2012 CRDC survey (U.S. Department of Education Office of Civil Rights, 2012). Given prior research indicating disproportionate SCP use against students with disabilities (Gershoff & Font, 2016; McFadden et al., 1992b), we included a measure of the **percent of students with disabilities** (defined as those receiving services under the Individuals with Disabilities Education Act (IDEA) or section 504 of the Rehabilitation Act of 1973). In addition, we included basic characteristics of the school, specifically **total school enrollment** and **instruction level** to reflect (as shown in our sample characteristics table) higher use by elementary and middle schools as compared with high schools. Four dummy indicators were used to measure instruction level. The first indicator was for **early education**, and was equal to 1 if the school reported serving any students in either pre-kindergarten or kindergarten. The remaining three instruction level indicators were coded as 1 if the school reported serving any students in **grades 1–5** (elementary), **grades 6–8** (middle), and **grades 9–12** (high school). Notably, because many schools combine instruction levels, or use different cutoffs to separate (e.g., having grades 1–6 for elementary instead of 1–5), these variables are not mutually exclusive.

3.3. Analytic Approach

Given the nested nature of the data, we used multilevel modeling to address our research questions. In our models of SCP use, there were four levels of geography to consider: schools, districts, counties, and states. Multilevel modeling allowed us to account for the non-independence of observations in a 4-level model (i.e., the general assumption that a school would be more similar to other schools in the same district than to schools in other districts). To investigate any SCP use, we regressed our dichotomous indicator of SCP on our explanatory variables in a multilevel logit model.

For schools that reported any use of SCP, the number of students paddled was modeled using a multilevel negative binomial model. Negative binomial models are a form of count model that are used when the degree of variation in the outcome is greater than the mean (in our case, the distribution of SCP amount of use is clustered at the low end and there is a long right tail). School enrollment was included as an exposure variable in this model, meaning that logged school enrollment was included in the model with the coefficient constrained to 1 in order to account for variation in the number of students for whom school corporal punishment could have occurred.

To model racial disparities in use of SCP, we used multilevel logistic regression, but due to sample restrictions, there were insufficient observations to include all four levels of analysis. We thus included only a county-level intercept, which was consistent with our use of primarily county- and school-level independent variables. All input variables were mean-centered prior to model estimation. Mean-centering is useful when some explanatory variables have arbitrary zeroes (e.g., a county would be unlikely to have a median household income of zero) and it would therefore be more helpful for the results to be interpreted with reference to the mean. In addition, where there are modestly correlated explanatory variables (for example, county median income correlated with percent with college degree), mean-

centering reduces the effects of this collinearity on standard error estimates (Iacobucci, Scheider, Popovich, & Bakamitsos, 2016).

In order to identify the relative importance of specific predictors, we also show the results of models using scaled versions of our input variables. Specifically, we used the approach recommended by Gelman (2008), which calls for dividing mean-centered quantitative predictor variables by two standard deviations. This rescaling leaves quantitative variables with a mean of 0 and a standard deviation of 0.5. Because two standard deviations would typically cover a wide range of values for a normally-distributed quantitative variable, the coefficient for a mean-centered variable divided by two standard deviations represents a comparison between the low and high end of observed values. Gelman (2008) suggests the coefficients for these transformed quantitative variables are comparable to the coefficients for binary variables which, by definition, represent the comparisons between the lowest and highest possible values. By using this rescaling, the coefficients for the quantitative variables can be compared with the coefficients for the binary variables using standard post-hoc comparison testing.

4. Results

4.1. Population Description

The characteristics of all public schools and their counties in the 19 states that legally allow SCP are described in Table 1, with descriptive statistics provided for the 32,469 schools that reported no corporal punishment use and the 5,534 schools in which at least 1 student was reported to have received corporal punishment. The average percent of Southern-born residents in the counties surrounding SCP schools was 77.9%, versus 51.8% for counties where schools not using SCP were located. Schools that reported any use of SCP were more than twice as likely to be in rural counties (versus metro counties). Counties of SCP schools had higher prevalence of Evangelical Protestants and Republican voters. Slightly more than half of schools not using SCP received Title I funds, compared with 76% of schools that used SCP, indicating that schools using SCP have higher proportions of low income students.

4.2. Use of School Corporal Punishment

The key coefficients from our unscaled model are shown in Table 2. (By unscaled, we are referring to models using the untransformed input variables, in contrast to subsequent figures which used input variables that were scaled using the approach described in the analysis section.) Coefficients are shown as odds ratios. Southernness and rurality were associated with higher odds of SCP use: a 1-point increase in the percent Southern-born corresponded to a predicted 3.7% increase in the odds of SCP, and the odds of use in rural counties were twice that of metro counties. Neither the interaction between Southernness and rural county, nor the indicator of farming and mining dependent county, was associated with SCP use. Both religious and political affiliations were found to be predictive: a 1-point increase in Evangelical Protestants was associated with a 1.3% increase in the odds of SCP, whereas a 1-point increase in Republican voters predicted a 5.4% increase in odds of SCP. Socioeconomic variables were also predictive, with a \$1,000 increase in median income

predicting a 4.5% decrease in the odds of SCP, and a 1-point increase in percent college-educated predicting a 10.5% decrease in odds. Further, we found significant associations for percent Black ($b=1.036$, $p<.001$) and its squared term ($b=-.999$, $p<.01$) with SCP use. That the coefficient for percent Black was positive and the coefficient for its squared term was negative indicates that the positive association between percent Black and SCP use was stronger at lower values of percent Black than at higher values. Notably, the coefficients for the percent Black students and percent Hispanic students were both negative, though only statistically significant for Hispanic students. Lastly, schools receiving Title 1 funds had nearly twice the odds of SCP use as compared with schools not receiving Title 1 funds.

In subsequent analyses (not shown), we delved further into the findings regarding county racial composition. In these analyses, we examined percent non-White and percent Hispanic instead of percent Black (with all other variables the same). Our results showed the percent non-White in the county was positively –but non-significantly—associated with SCP use, and its squared term was negative and statistically significant. Both percent Hispanic and its squared term were negatively and non-significantly associated with use of SCP.

To illustrate the difference in magnitudes of specific associations, we show the key coefficients from a model of SCP use based on scaled versions of our input variables in Figure 1. The bars indicate the size of the coefficients from the model with rescaled predictors (as described in the analytic approach), which allow for direct comparison of the influence of binary and numeric variables. As is evident from Figure 1, the percent of county residents who were born in the South and the percent with a bachelor's degree (or higher) were most influential on the odds of SCP use. (Post-hoc Wald tests revealed that the absolute magnitude of coefficients for these two variables are statistically equivalent to one another, but significantly different from coefficients for all other predictors shown except for Republican voters).

A model predicting the number of students that received corporal punishment is shown in Table 3. Coefficients are in the form of incidence risk ratios. Among schools that use corporal punishment, those in rural counties with a higher proportion of Southern-born residents use SCP on more students; the main effects of percent Southern-born and rural county were not statistically significant. There were no associations between Evangelical Protestantism or being in a farming- or mining-dependent county and the rate of corporal punishment. Republican vote share predicted higher numbers of students receiving corporal punishment ($b=1.008$, $p<.05$) whereas the percent of the county with a bachelor's degree and median household income both predicted less use ($b=-.980$ $p<.001$; $b=-.987$ $p<.01$). As hypothesized the percent of students who were Black was associated with a higher number of students receiving corporal punishment; the percent of students who were Hispanic was not predictive. The percent of county residents who were Black was associated with an increase in the number of students receiving corporal punishment, and this association decreased in strength at higher levels of the Black population. As with any SCP use, we re-examined these models for number of students experiencing SCP to consider whether the findings with regard to the county percent Black apply to other minority groups (results not shown). Once again, we found that the associations between percent non-White or percent

Hispanic and the number of students receiving SCP were negative and non-significant, respectively.

Figure 2 shows the key coefficients for the scaled version of the model predicting the number of students receiving SCP. Coefficients were generally small in magnitude and all of the variables with statistically significant associations with the number of students paddled had similarly sized coefficients. Post-hoc Wald tests revealed that the coefficient for Title 1 funding had a smaller absolute magnitude than percent Black students and percent college educated, but all other statistically significant coefficients were of statistically equivalent magnitude.

4.3. Racial Disparities

We focused on disproportionate use of SCP with Black students relative to other groups because there was no indication in our data (or in past work; Gershoff et al., 2015) that Hispanic students were at disproportionate risk of receiving SCP. That is, in our data, among the schools using corporal punishment that had student populations including Hispanics and non-Hispanic Whites, we found that Hispanic students had a slightly lower rate, on average, of SCP receipt. Yet, among schools using corporal punishment that had student populations including Black and non-Black students, Black students received corporal punishment at a rate 2.5 times higher than other students.

The results of three models examining the characteristics associated with disproportionate use of SCP against Black students (as compared with all other students) are found in Table 4. Results are shown in the form of odds ratios. Each model varies in how it limits the sample based on schools' racial diversity and amount of corporal punishment. Across all three models, three of our key variables were associated with disproportionate use against Black students. Schools in counties with high proportions of Evangelicals and Black residents, and schools with a high proportion of Hispanic students, were more likely to have racially-disparate SCP use. In the less-restrictive models, schools with a higher proportion of Black students were also more likely to have disparate use. In the least restrictive model only (the model requiring only 1 Black student and one SCP instance per school), the percent of Republican voters was associated with increased odds of a racial disparity in SCP use. Geographic and socioeconomic characteristics did not predict racially-disparate SCP use in any of the models.

5. Discussion

Prior research has described state-level correlates of the use of corporal punishment in schools (Gershoff, et al., 2015) and has described the geographic distribution of SCP use and disparities (Gershoff & Font, 2016). However, comprehensive and universal data on the nation's schools had not previously been used to understand the factors linked with individual schools' corporal punishment practices; this is the first paper to do so. We constructed our models under the assumption that schools' use of corporal punishment was at least in part a reflection of several aspects of their surrounding cultural, socioeconomic, and racial context. It has previously been observed that the legality, and prevalent use, of SCP is concentrated in the South (Gershoff & Font, 2016). Further, it was known that SCP

use varied significantly within states, with one study indicating greater usage in rural areas (McClure & May, 2008). This study sought to further explore the role of Southernness and rurality in the use of SCP, and to determine what other characteristics been explained variation in use. Aside from indicators of Southernness and rurality, we examined cultural characteristics (Evangelical Protestantism and Republicanism), socioeconomic factors (income and education levels), and racial composition.

Overall, we found fairly large associations between Southernness (the percent of county residents that were born in a Southern state) and the probability that a school used corporal punishment. Indeed, Southernness was the single best predictor of SCP use, after accounting for rurality and cultural, socioeconomic, and racial context variables. Rural counties also had higher odds of SCP use, and among schools using corporal punishment, Southernness was only associated with a higher amount of SCP use in rural counties. Overall, higher probability of SCP use and higher amounts of use in the South and rural areas were not fully explained by religious, political, socioeconomic, or racial attributes.

Both high county-level rates of Republican voters and of Evangelical Protestants were associated with increased odds of any SCP use, though only the level of Republican voters was predictive of higher amount of use. Evangelical Protestant affiliation consistently predicted racially-disparate use, whereas findings on Republican affiliation and racially-disparate use were dependent on model specification. We would expect Evangelical Protestantism and Republican voting to have similar associations with SCP, given that the majority of Evangelicals identifies as Republican or leans Republican in voting (Pew Research Center, 2016). The associations of these characteristics with SCP use are consistent with research that has linked political conservatism to support for both parental corporal punishment and harsh responses to crime (Duckitt, 2009; Ellison & Bradshaw, 2009) and with research linking Evangelical Protestantism with support for parental corporal punishment and harsh attitudes toward juvenile justice (Ellison & Sherkat, 1993; Gershoff, Miller, & Holden, 1999; Grasmick, Morgan, & Kennedy, 1992; Grogan-Kaylor & Otis, 2007). Moreover, the persistence of SCP in politically conservative areas, despite general declines in use across the U.S., may also reflect the fact that conservative attitudes have been found to be relatively more resistant to change than other political ideologies (Jost et al., 2007). Associations of Evangelical Protestant affiliation, and to a lesser degree, Republican voting, with disproportionate use of SCP against Black students is not entirely surprising. Whites who identify as Republican or Evangelical have been found in prior studies to be uninterested in, or opposed to, policies addressing racial inequalities and are less likely to view racial inequalities as the result of discrimination (McKenzie & Rouse, 2013; Reyna et al., 2006).

Turning to socioeconomic factors, the college education rate (the percentage of county adults with a bachelor's degree) was among the best predictors of the use of SCP and of the amount of use. A county's median household income and whether a school receives Title I funding were also predictive of SCP use and amount of use, but to a lesser extent than the college education rate. These findings are consistent with research indicating higher acceptance and support for parental use of corporal punishment among people with lower levels of education and income (Button, 2008; Douglas, 2006). Overall, the similarity in

associations of socioeconomic characteristics with both parental and school corporal punishment suggests that support for SCP and parental corporal punishment may stem from similar experiences and worldviews.

Our findings on race were somewhat consistent with expectations. First, the percent Black in the county was predictive of an initial increase in the odds of SCP use and the number of students receiving corporal punishment, but the negative coefficient for the squared term, along with a post-hoc examination of the predicted values, showed that these associations were attenuated as the percent Black reached high values. This indicates that there are greater differences in the probability of any SCP and the amount of SCP for counties where Blacks are a minority than in counties where Blacks are a majority. Second, the percent Blacks at the school level was not predictive of SCP use, but was strongly predictive of the amount of use among schools that had any use. That is, whereas racial contexts within a community may be driving decision-making around the permissibility of SCP, it appears that the racial demographics of the school drive how often it is applied. Though seemingly inconsistent, these findings likely reflect that school policy is often set at the district level (which may be better depicted by county demographics than by the demographics of students at any individual school) but implemented at the school level. That is, while the broader population of voters and parents in a district may influence whether SCP is allowed at all, where it is allowed, schools may be reacting primarily to their own student population in deciding how frequently it is applied. We also found that the percent Black in the county and in the school both predicted higher odds of racially-disparate use. There is at least one potential explanation that we were not able to test empirically, which relates to the potential use of opt-in and opt-out policies. Some districts and schools that use corporal punishment allow parents to opt out, and, given higher acceptance of corporal punishment among Black parents (Taylor et al., 2011), it is plausible that Black parents are less likely to opt out than White parents. Lower opt-out rates among Black parents could explain, in part, larger disparities in SCP as well as higher overall rates of use in areas with larger Black populations. Unfortunately, schools are not currently asked to provide information on opt-out policies in the mandatory federal Civil Rights Data Collection surveys. Future research should examine the use and effects of opt-in or opt-out policies on SCP use and disparities.

There are a few limitations of note. First, a significant limitation of this study is that we were unable to consider the potential effects of the racial composition of school staff and administrators. Representativeness—the extent to which teachers and administrators reflect the demographics of the school—has been shown to be significantly associated with disciplinary decisions, with more representative schools reducing disparities by race (Grissom, Kern, & Rodriguez, 2015). Second, although we argue that the community influences school practices, specific groups within a community may vary in their level of influence, based on whether they are engaged with school activities, attend local school board meetings, or participate in parent-teacher associations. Lastly, our findings rely on cross-sectional data and so we cannot say definitively whether changes to the local context would significantly alter SCP use.

6. Conclusion

The present findings hold important implications for the well-being of disadvantaged children. We found that the same factors associated with parental use of corporal punishment (i.e., religious and political conservatism, low socioeconomic status), in aggregate, also predicted schools' use of corporal punishment as a part of its disciplinary system. Given racial disparities in SCP as documented here and elsewhere (Gershoff & Font, 2016) and the concentration of SCP use in socioeconomically-disadvantaged areas, it appears that the children most likely to be exposed to SCP are the same children who are likely to receive corporal punishment in the home. Rates of corporal punishment are higher in Black families and families with lower socioeconomic status than in families from other racial or ethnic groups and socioeconomically-advantaged families (Gershoff et al. 2012; Wissow 2001; Youssef, Attia, & Kamel, 1998). Thus, for some children, particularly Black children and children from socioeconomically-disadvantaged communities, it may be the case that neither home nor school provides an environment free of the threat of violence. Moreover, given what is known about the potential harm associated with parental use of corporal punishment (Gershoff & Grogan-Kaylor, 2016), there is little reason to suspect that the impacts of SCP would be more positive; to the contrary, SCP may compound the negative impacts of parental corporal punishment. Behavioral problems are both an antecedent to and consequence of harsh physical punishment (Font & Berger, 2015); thus, schools' use of paddling may exacerbate the very problems they aim to discourage. However, future research is necessary to identify the effects of SCP on children's socialization and achievement.

In this study, we identified several significant county- and school-level factors linked with whether SCP is used in a school, how often it is used, and whether it is used disproportionately with Black students than with their peers. Given the recent call by the U.S. Secretary of Education (King, 2016) for schools to end corporal punishment and the broader federal push to institute positive school disciplinary practices (Duncan, 2014; Losen & Martinez, 2013; Noltemeyer, Ward, & McLoughlin, 2015), our findings help pinpoint the schools and counties that will need the most assistance in replacing SCP with alternative methods of discipline. In addition, given that schools receiving Title I funds were more likely to use corporal punishment, tying Title I funding to changes in disciplinary regimes is a potential avenue for reducing SCP use. However, given difficulties in passing federal legislation, state-level efforts to ban school corporal punishment, perhaps beginning with the states that have very few schools currently reporting use, may be the most promising path toward providing all children with a school environment free of permissible violence.

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Highlights

- We examined correlates of school corporal punishment (SCP) use and disparities
- Cultural, socioeconomic, and racial characteristics all predicted SCP use
- School and county racial composition predicted disparate use against Black students

Figure 1.

Factors associated with whether school corporal punishment is used in a school among 19 states where it is legally permitted (N = 38,003).

Note: Input variables rescaled using Gelman's (2008) recommendations; coefficients for quantitative and binary variables are directly comparable. Results are from models that include all listed variables as well as controls for school instruction level, percent of students with disabilities, and total enrollment. Error bars indicate 95% confidence intervals.

Figure 2.

Factors associated with the number of students subjected to school corporal punishment among schools that use it ($n = 5,534$).

Note: Input variables rescaled using Gelman (2008) recommendations; coefficients for numeric and binary variables are directly comparable. Results are from models that include all listed variables as well as controls for school instruction level, percent of students with disabilities, and total enrollment. Error bars indicate 95% confidence intervals.

Table 1

Characteristics of schools and their surrounding counties in the 19 states that allow school corporal punishment (SCP).

Variable Name	Schools that did not use SCP in 2011–2012 <i>n</i> = 32,469	Schools that did use SCP in 2011–2012 <i>n</i> = 5,534
County-Level Cultural Factors		
Percent Southern-born	51.77	77.92
Rural county	0.22	0.60
Farming- or mining-dependent county	0.05	0.11
Percent Evangelical	24.60	38.98
Percent Republican	54.31	64.75
County and School Racial Composition		
Percent Black (county)	13.55	14.87
Percent Hispanic (county)	13.28	7.23
Percent Black (school)	20.08	20.06
Percent Hispanic (school)	22.91	13.23
County and School Socioeconomic Factors		
Percent with bachelor's degree (county)	25.06	16.22
Median household income (\$1,000s) (county)	48.46	40.35
School received Title I funding	0.55	0.76
School-Level Covariates		
Student enrollment	571	457
Percent students with disabilities	14.60	13.86
Charter school	0.07	0.01
Alternative school	0.05	0.01
Pre-K / Kindergarten ¹	0.56	0.53
Grades 1–5	0.60	0.64
Grades 6–8	0.39	0.51
Grades 9–12	0.26	0.27

Note: Means or proportions are shown.

¹Given that schools may have more than one grade across these categories, percentages in columns do not add to 100.

Table 2

Results of Multilevel Logistic Regression Predicting Any SCP Use (Unsealed version)

County-level factors	
Percent Southern-born	1.037(.008) ***
Rural county	2.043(.357) ***
Southern-born x Rural	1.006(.004)
Farming- or mining-dependent	.934(.190)
Percent Evangelical Protestant	1.013(.006) *
Percent Republican voters	1.054(.009) ***
Percent college-educated	.895(.012) ***
Median household income	.955(.011) ***
Percent Black residents	1.036(.010) ***
Percent Black residents, squared	.999(.000) **
School-level factors	
Receives Title I funds	1.954(.148) ***
Percent Black students	.997(.002)
Percent Hispanic students	.991(.003) **
Variance components (constant)	
State	4.008(1.057)
State County	.996(.208)
State County District	6.791 (.481)

Notes: $N=38,003$. Model was restricted to states where SCP is legal. Model includes controls for school instruction level, enrollment, and percent of students with disabilities.

Exponentiated coefficients are presented. Standard errors are in parentheses.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 3

Incidence-Rate Ratios for the Number of Students Receiving Corporal Punishment (Unsealed Version)

County-level factors	
Percent Southern-born	1.000(.003)
Rural county	1.027(.076)
Southern-born x Rural	1.006(.002) *
Farming- or mining-dependent	1.051 (.071)
Percent Evangelical Protestant	1.002(.002)
Percent Republican voters	1.008(.004) *
Percent College-educated	.980(.005) ***
Median household income	.987(.004) **
Percent Black residents	1.011(.004) **
Percent Black residents, squared	1.000(.000) ***
School-level factors	
Receives Title I funds	1.157(.047) ***
Percent Black students	1.007(.001) ***
Percent Hispanic students	.998(.001)
Variance components (constant)	
State	.229(.093)
State County	.087 (.022)
State County District	.243 (.026)

Notes: $n=5,534$. Model was restricted to schools reporting SCP in states where SCP is legal. Model includes controls for school instruction level, enrollment, and percent of students with disabilities. Exponentiated coefficients are presented. Standard errors are in parentheses.

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.

Table 4

Factors associated with racial disparities in SCP.

	Schools at least 1 Black and 1 non- Black student and with at least one instance of SCP (<i>n</i> =4,967)	Schools with at least 15 Black and 15 non-Black students and with at least one instance of SCP (<i>n</i> =3,041)	Schools with at least 15 Black and 15 non- Black students and with at least 10 instances of SCP (<i>n</i> =1,994)
County-level factors			
Percent Southern-born	1.001 (.004)	1.001 (.005)	.998 (.009)
Rural county	1.260 (.184)	1.387 (.277)	1.285 (.384)
Southern-born x rural	.999 (.004)	.992 (.006)	.998 (.009)
Farming- or mining- dependent	1.019(.124)	1.198(.178)	1.068 (.188)
Percent Evangelical Protestant	1.009(.003) **	1.012(.004) **	1.014 (.005) **
Percent Republican voters	1.012(.006) *	1.009(.008)	1.011 (.010)
Percent college-educated	.995 (.008)	.992 (.009)	.991 (.011)
Median household income	1.012 (.008)	1.012(.009)	1.020(.011)
Percent Black residents	1.036(.006) ***	1.021 (.007) **	1.019(.009) *
Percent Black residents, squared	1.000(.000) ***	1.000(.000)	1.000 (.000)
School-level factors			
Title 1 funding	.985 (.092)	1.003 (.111)	1.070(.149)
Percent Black students	1.018 (.002) ***	1.013 (.002) ***	1.004 (.003)
Percent Hispanic students	1.005 (.002) **	1.007(.003) **	1.007 (.004) *
County variance component	.077(.070)	.097(.050)	.175 (.050)

Note: Models were restricted to states where SCP is legal. Results are from models that include controls for school instruction level, percent of students with disabilities, and total enrollment. Standard errors are in parentheses.

*
 $p < .05$,

**
 $p < .01$,

 $p < .001$.