

Racial disparities in school discipline in Collier County, Florida

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SUMMARY

Racial disparities in school discipline have existed throughout America's history. Schools suspend Black students at higher rates than White students for similar or lesser levels of poor behavior. The purpose of this study was to examine whether these racial disparities existed in our local community of Collier County, Florida, and, if present, to determine whether these disparities had decreased between the 2013-14 academic year and the latest year for which we had data (2020-21). We analyzed data from the Florida Department of Education Office of Safe Schools regarding disciplinary outcomes in Collier County public schools in 2020-21. Black students were 2.98 times more likely to receive in-school suspensions and 2.38 times more likely to receive out-of-school suspensions than White students in 2020-21, which supported our first hypothesis. However, our second hypothesis was not supported, as the racial discrepancy in Collier County increased for in-school suspensions and decreased minimally for out-of-school suspensions over those seven years.

INTRODUCTION

Over half a century ago, schools introduced suspensions to correct student behavior (1). In 1976, O'Brien described one of the earliest in-school suspensions in Minneapolis, Minnesota (2). Suspension generally refers to the short-term exclusion of a student from the educational setting because of a violation of school behavior policies.

The majority of public schools in America in the mid-1990s adopted "zero-tolerance" policies as part of the "War on Drugs" and mandated immediate, strict, and harsh penalties (3). While these "zero-tolerance" policies initially focused on illegal drug use and weapons, many public schools expanded the scope of these policies to include more minor offenses, including truancy, tobacco possession, and disobedience (3). Moreover, considerable variability existed across America in the application of these policies. The Gun-Free Schools Act of 1994 responded to an increased prevalence of weapons at or near schools and school mass shootings such as Columbine (3). This act mandated the expulsion of any student found to have a weapon, including a knife or firearm, at school (3). Some argue that the Gun-Free School Act caused an unwarranted increase in punitive and exclusionary discipline outcomes (4).

Systemic racism and discrimination have existed in America since before the country's founding and have taken many forms, from outright chattel slavery to Jim Crow laws

to other acts of harm in many areas of life. In particular, discriminatory school discipline remains a salient issue across America. Various states have attempted to address the issue of discriminatory school discipline. For example, the 2016 Illinois Public Act 99-0456 required districts to amend their discipline policies to limit disciplinary exclusion, such as out-of-school suspensions and expulsions (5). The law also addressed the "school-to-prison pipeline" by legislating guidelines for discipline, especially in response to minor behavior problems (5). In addition, it required school administrators, educators, and staff to undertake professional development training regarding the importance of cultural sensitivity while considering alternatives to school suspension (5).

Race is undoubtedly a critical factor in education in America (6). Significant racial disparities exist in school resources, educational opportunities, and dropout rates between Black and White children (7). Moreover, several studies demonstrate that Black schoolchildren are subject to disproportionately more severe disciplinary measures compared to White schoolchildren for similar or lesser levels of poor behavior (6, 8). Furthermore, another study demonstrated that one in four Black high school students received at least one suspension during the 2009-10 school year (9). This suspension rate was 3.5 times the rate of White students during the same period (9).

A study that examined racial, ethnic, and gender differences in school discipline over fourteen years between 1991 and 2005 found that despite a decrease in school discipline rates over that period for most racial groups, the discipline rates for Black students increased over this same period (3). Moreover, the authors noted that differences in socioeconomic status are often proposed as reasons for differences in race-based disciplinary discrepancies and utilized logistic regression analysis to demonstrate that these differences do not account for the discrepancies (3). Additionally, a 2014 study of ninth-grade students in Florida revealed that 39% of Black students had been suspended, compared to 22% of White students (10).

On average, Black boys receive harsher discipline outcomes than all other demographic groups sorted by race and gender (6). However, racial disparities in disciplinary outcomes are not restricted to Black boys: one study revealed that Black girls received a disproportionate share of harsh disciplinary outcomes compared to White or Latinx girls (11). Moreover, the U.S. Department of Education data also revealed that Black girls are six times as likely as White girls to receive an out-of-school suspension (12). This represents an even higher racial disparity in discipline outcomes than boys, as Black boys are 3.3 times more likely than White boys to be suspended or expelled (3). The intersectionality of

race and gender, introduced by Kimberle Crenshaw, plays an integral role in the educational experiences of Black children (13). Another study examined the gendered racial stereotypes Black girls face at school, which often characterize these children as loud, hostile, and angry (14). Reasons for the sizeable racial discrepancy in disciplinary outcomes may be due to implicit and explicit racial biases possessed by teachers and school administrators (15). For example, Monroe demonstrated in 2005 that teachers unconsciously interpreted Black boys' behavior as threatening and expected Black boys to misbehave (16). The bias against Black girls may be due, in part, to the stereotype that they behave assertively and loudly, which contradicts American standards of "lady-like" behavior (17,18). Also, White students receive discipline for more objective reasons (e.g., vandalism, smoking, fighting), while Black students receive discipline for more subjective reasons (e.g., disrespectful behavior or behaving in a threatening manner) (15).

Undoubtedly, school districts must maintain the option to use suspensions to ensure their schools' safety (19). However, even as the rate of suspensions of Black students increases, it remains unclear whether suspensions improve students' behavior (20). Hundreds of thousands of students of all races are removed from the educational process in the United States each year due to school discipline (3). This exclusion of students from the learning environment is strongly associated with numerous adverse outcomes, including increased substance abuse and decreased academic achievement (21). Also, out-of-school suspensions have other undesirable effects on students, including worsening behavioral issues and increased rates of dropout and incarceration (22). For example, one study demonstrated that out-of-school suspensions significantly, negatively, and persistently affect math achievement after controlling for individual and school factors (23). This lower level of math achievement persisted over time, as suspended students' math scores were lower two years after the suspension (23). Moreover, studies have

demonstrated that schools with higher suspension rates are not safer, and the students are not better behaved (20).

The Black Lives Matter movement began in the summer of 2013 after the acquittal of George Zimmerman in the murder of Trayvon Martin. In addition, several other racial and social justice organizations became prominent after the Ferguson, Missouri protests in 2014 and continue to effect crucial social justice change today. An increased awareness nationwide about racial injustice may have precipitated changes in school policies that subsequently decreased racial disparities in school discipline.

In this study, we investigated whether racial disparities in disciplinary action between White and Black students were present in our local community. Our first hypothesis was that racial inequity in school discipline exists in Collier County, Florida. Our second hypothesis was that if racial inequity in school discipline in Collier County exists, the magnitude of that discrepancy would be less in 2020-21 than it was in 2013-14, correlating with the prominence of America's social and racial justice movements over that seven-year interval. Our results supported our first hypothesis with a statistically significantly higher percentage of Black students receiving both in-school and out-of-school suspensions than White students. However, our second hypothesis was not supported, as the racial discrepancy increased for in-school suspensions and was essentially unchanged for out-of-school suspensions over those seven years.

RESULTS

We used the most recent discipline data (2020-21) from the Florida Department of Education to examine racial disparities in school discipline in Collier County (24). There were 48,821 students enrolled in the Collier County Public School District in 2020-21 (25). Among enrolled students, 11.08% (n=5409) identified as Black, while 33.07% (n=16,147) identified as White (Figure 1).

During the 2020-21 school year in Collier County,

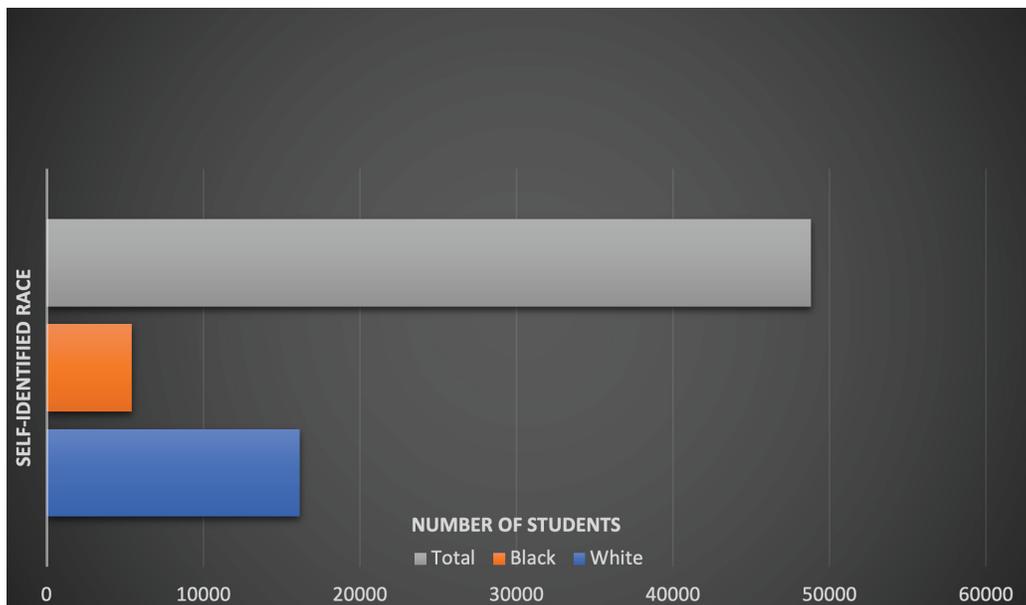


Figure 1: Collier County public school district students by race 2020-21. There were 48,821 total students of all races enrolled in the Collier County Public School District in 2020-21. 5,409 (11.08%) identified as Black and 16,147 (33.07%) identified as White.

13.00% (n=703) of Black students and 4.36% (n=704) of White students received in-school suspensions (**Figure 2**). A higher proportion of Black students received in-school suspensions than White students ($z = 22.23, p < .00001$ one-tailed). During this same school year, 7.91% (n=428) of Black students received out-of-school suspensions compared to 544 or 3.37% of White students (**Figure 3**). Likewise, a higher proportion of Black students received out-of-school suspensions ($z = 14.54, p < .00001$ one-tailed). Overall, Black students received in-school suspensions at 2.98 times the rate of White students and out-of-school suspensions at a

rate of 2.35 times the rate of White students.

We also used earlier 2013-14 discipline data from the Florida Department of Education to examine racial disparities in school discipline in Collier County (24). There were 43,861 students enrolled in the Collier County Public School District in 2013-2014 (32). The percentage of students who identified as Black was 12.04% (n=5,281), and 37.11% (n=16,275) of students identified as White (**Figure 4**) (25).

During the 2013-14 school year, 13.22% (n=698) of Black students and 6.19% (n=1007) of White students received in-school suspensions (**Figure 5**). A higher proportion of Black

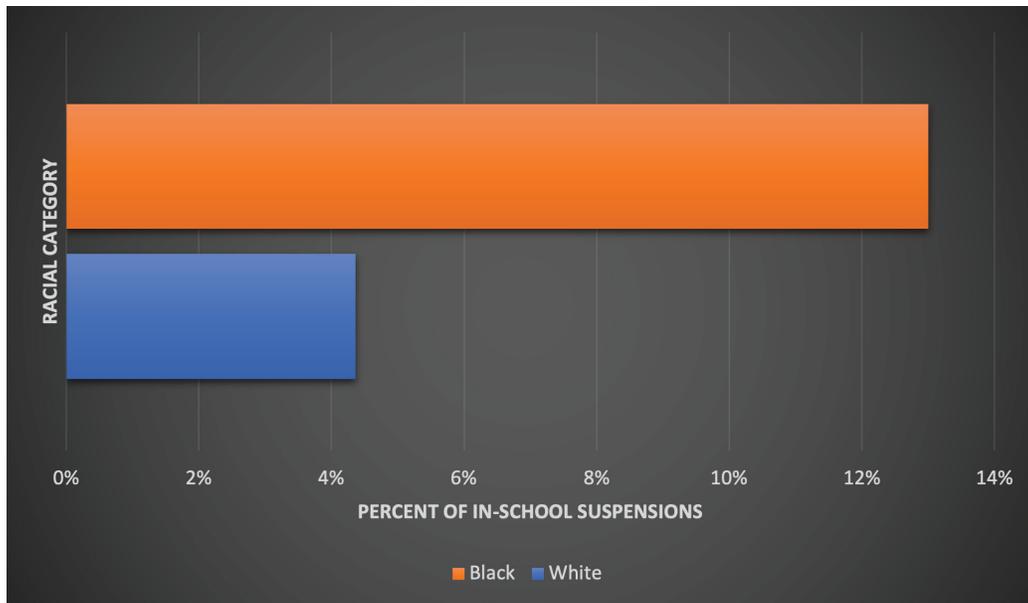


Figure 2: Collier County public school district percent of students who received in-school suspensions by race 2020-21. During the 2020-21 Collier Public School year, 703 (13.00)% of Black students and 704 (3.37%) of White students received in-school suspensions. $p < .00001$ (two-sample z-test of proportion).

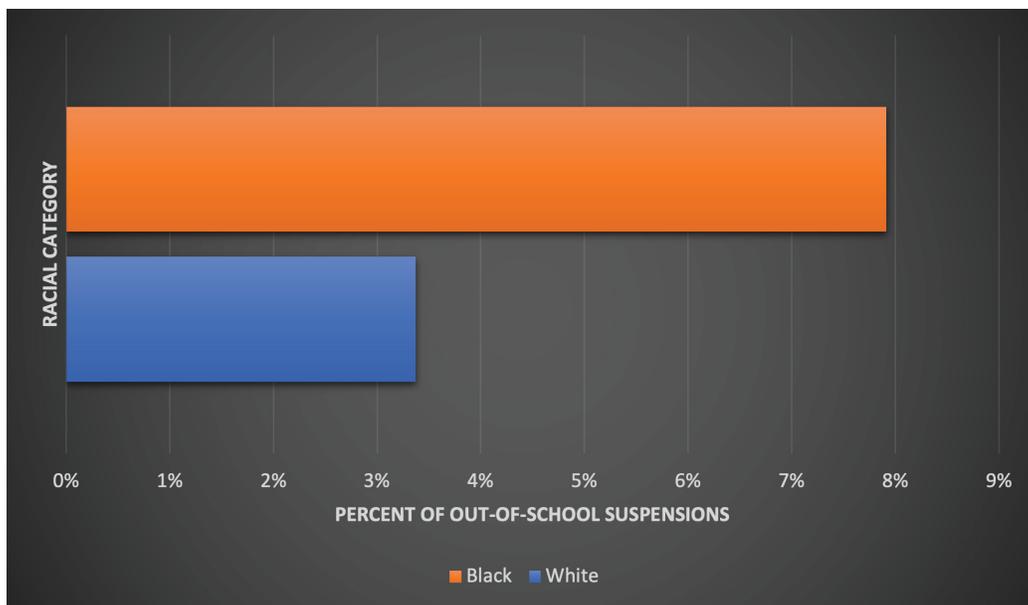


Figure 3: Collier County public school district percent of students who received out-of-school suspensions by race 2020-21. During the 2020-21 Collier Public School year, 428 (7.91)% of Black students received out-of-school suspensions compared to 544 (3.37%) of White students. $p < 0.00001$ (two-sample z-test of proportion).

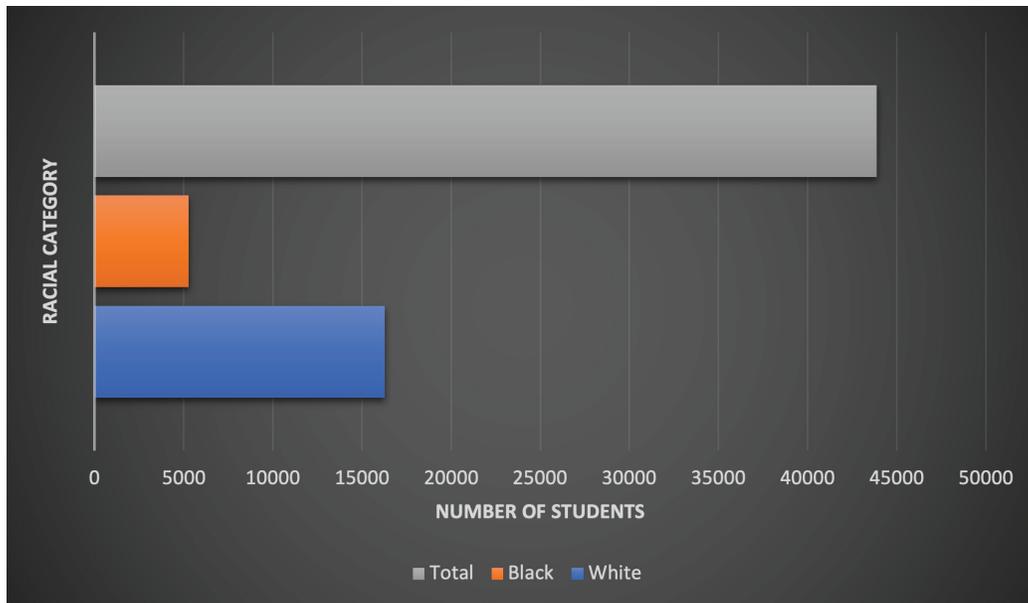


Figure 4: Collier County Public School District Students by Race 2013-14. There were 43,861 total students of all races enrolled in the Collier County Public School District in 2013-2014. 5,281 (12.04%) identified as Black and 16,275 (37.11%) of students identified as White.

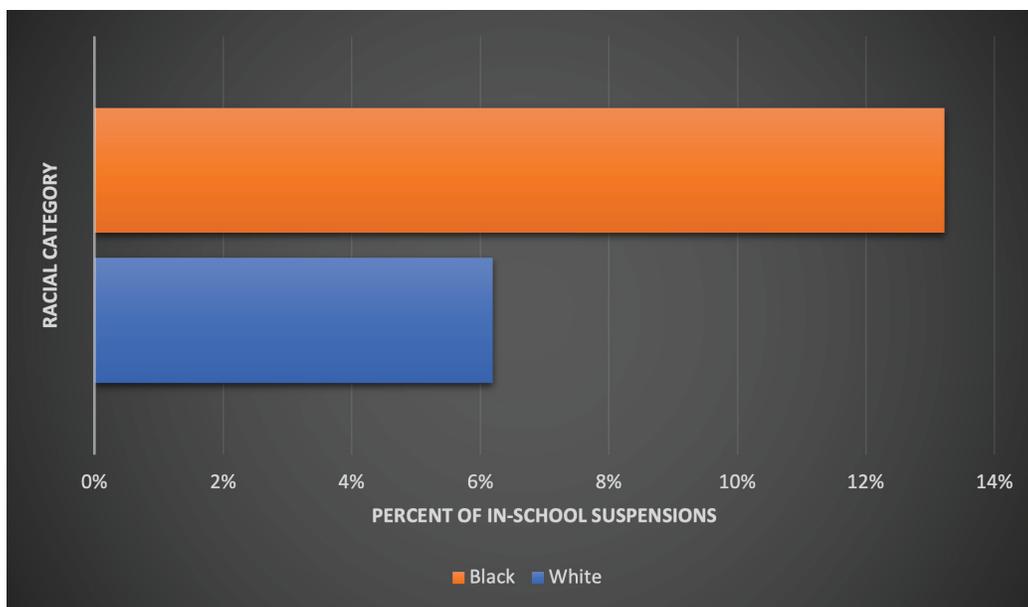


Figure 5: Collier County public school district in-school suspensions by race 2013-14. During the 2013-14 Collier Public School year, 698 (13.22%) of Black students and 1,007 (6.19%) of White students received in-school suspensions. $p < 0.00001$ (two-sample z-test of proportion).

students received in-school suspensions ($z = 16.45, p < .00001$ one-tailed). During this same school year, 8.09% ($n=427$) of Black students and 3.32% ($n=540$) of White students received out-of-school suspensions (Figure 6). A higher proportion of Black students received out-of-school suspensions ($z = 14.54, p < .00001$ one-tailed). Overall, Black students received in-school suspensions at a rate of 2.14 times the rate of White students and out-of-school suspensions at a rate of 2.44 times the rate of White students. In-school suspension discrepancies in Collier County increased substantially between 2013-14 and 2020-21, from a ratio of 2.14 to 2.98, and out-of-school suspension discrepancies were essentially

unchanged, dropping from a ratio of 2.44 to 2.38.

DISCUSSION

Our results demonstrated that a statistically significantly higher percentage of Black students received both in-school and out-of-school suspensions than White students during the 2013-14 and 2020-21 school years in the Collier County Public School District. These findings support our first hypothesis that racial inequity exists in school discipline outcomes in Collier County. Moreover, our results demonstrated that in 2020-21, Black students were approximately three times more likely to receive in-school suspensions and about 2.4

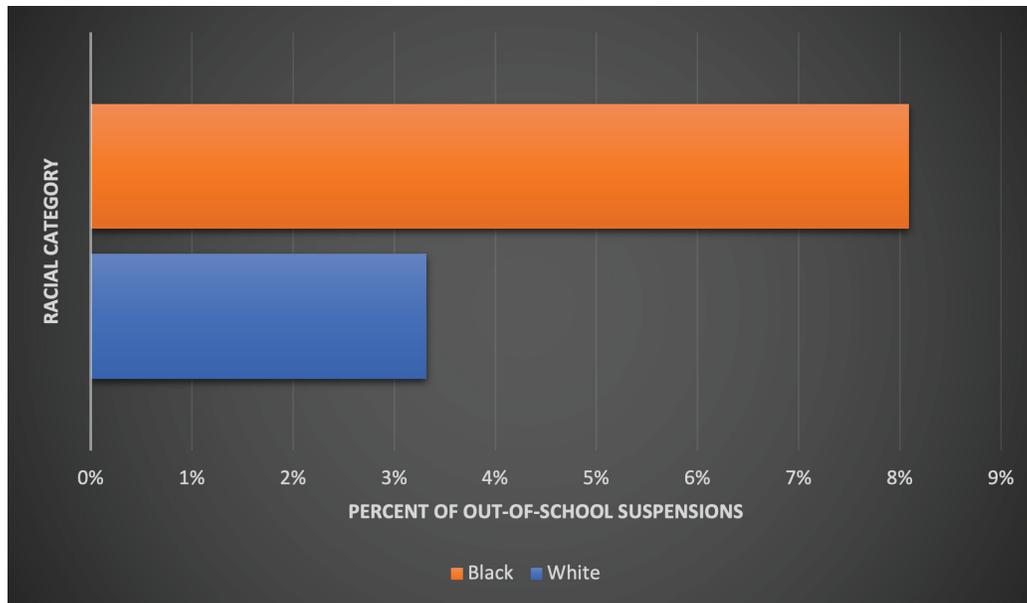


Figure 6: Collier County public school district percent of students who received out-of-school suspensions by race 2013-14. During the 2013-14 school year, 427 (8.09%) of Black students and 540 (3.32%) of White students received out-of-school suspensions. $p < 0.00001$ (two-sample z-test of proportion).

times more likely to receive out-of-school suspensions than White students. Our results are similar to those of the Losen and Martinez study, which examined data from the United States Department of Education for the 2009-10 school year demonstrating that Black students received 3.5 times more suspensions than White students (9).

Our results did not support our second hypothesis that racial discrepancy in school discipline outcomes in Collier County decreased during the seven years between 2013-14 and 2020-21. We chose the 2013-14 school year because the emergence and prominence of several racial and social justice organizations, such as the Black Lives Matter movement, occurred shortly after that. We hypothesized that the rise of these movements would increase awareness across America about racial discrimination and bias over those seven years and consequently cause a decrease in racial discrepancies in disciplinary outcomes in Collier County. While it is possible that an increase in awareness and a reduction in discrimination and racial bias occurred throughout the country, including Collier County, it did not seem to affect the racial inequity in school discipline outcomes in Collier County over those seven years. Several plausible explanations for this lack of inequity include structural and systemic racism ingrained in our education system, discriminatory school discipline policies, and the demographics of schoolteachers (predominantly White women) not reflecting the population of students they teach.

Florida has the fourth largest student population in America and suspends the highest percentage of students (12). Gagnon, Gurel, and Barber performed a state-level analysis of school punitive discipline practices in Florida and used multilevel regression analysis to demonstrate that schools with higher ratios of Black students more frequently utilized punitive discipline practices such as suspensions, expulsions, restraints, and corporal punishment (26). The authors also noted that schools used these punitive discipline

practices disproportionately with Black students (26).

Additionally, a study demonstrated that the most significant decrease in the odds of student academic success occurs with the first suspension, as the odds of graduating decline from 75% to 50%, and the odds of enrolling in post-secondary institutions of higher learning decrease from 58% to 39% (10). The authors also found that each additional suspension decreased the student's odds of graduating by 20% and the odds of pursuing post-secondary education by 12% (10). This evidence suggests that alternatives to out-of-school suspensions can significantly impact the trajectory of the educational experience for many students.

It is reasonable to examine whether the racial disparity displayed in our results is partly cyclical. A 2020 study examined the relationship between perceived racial fairness and school discipline (27). The authors found a significant and sizeable positive correlation between perceived racial fairness and out-of-school suspensions for Black boys (27). Their findings were consistent with previous studies demonstrating that behavior among Black high school students is significantly related to their perceptions of racial fairness (28). In addition, Griffin et al. have proposed that the association between Black high school students' perceptions of racial fairness and discipline outcomes may be bidirectional, as students who believe that discipline is inequitable may conclude that the school is acting in a discriminatory manner (27). In 2007, Mattison and Aber examined the relationship between school racial climate and students' self-reports of academic and discipline outcomes (28). On average, students in schools with higher suspension rates had more negative views of the racial school climate, with Black girls having the most negative perceptions (28). In addition, Black boys with more positive perceptions of school racial climate demonstrated fewer behavioral problems (28).

Thorough collection, analysis, and reporting of disciplinary data are vital to examine inequities in school discipline outcomes (29). Our study demonstrates the need to collect

and analyze school discipline data and disaggregate the data by race and gender. Moreover, schools and districts should be held accountable for racial disparities in discipline. Future studies may also include disaggregating the data by sexual orientation, religion, and disability, among other markers of student identity that may be risk factors for differential treatment due to implicit bias or overt discrimination. Additional studies are necessary to examine racial discrepancies in school discipline comparing other races to White students. In addition, future studies must examine teacher and administrator bias. Professional development for teachers and administrators on cultural sensitivity and cultural competence discipline panels that include community members may help decrease the racial disparity in school discipline. Moreover, failure to address these disciplinary racial disparities by implementing culturally relevant disciplinary practices could result in the failure of policies that have been put in place to close the racial achievement gap.

A limitation of our study includes the unknown effect of the COVID-19 pandemic on the 2020-21 data. Specifically, we are unaware of how returning to the classroom after a period of virtual learning affected students' behavior and how post-pandemic voluntary virtual learning was stratified by race. In addition, the exclusion of mixed-race students from the data warrants further investigation since many of these students are often identified as, and are viewed as Black. Lastly, we examined only two years of data and additional research is indicated to examine subsequent years as public awareness or racial injustices in America, including in our education system, continues to grow.

The issue of race-based inequities in America's school disciplinary practices has become an important social justice issue, and it is paramount that we as a nation move towards creating and maintaining racially unbiased school environments. Many policy changes, such as requiring implicit bias training in schools, can be made at the federal and state levels. There is a pressing need to dismantle racial inequities in school discipline, which cause more significant disruptions in learning for Black students than White students and persist in the face of increased social awareness of this critical inequity.

MATERIALS AND METHODS

Data on students in Collier County, including race and number of suspensions, from 2013 through 2021, were collected from the Florida Department of Education Office of Safe Schools (24). In an Excel spreadsheet, the most recent data (2020-21) regarding the number of in-school and out-of-school suspensions for Black and White students in Collier County Public Schools was entered.

Data from the Collier County Public Schools (CCPS) Data Profile for 2020-21 was then collected to determine the number of Black and White students enrolled in the district (25). This data was entered by race as a percentage of total district students on the same Excel spreadsheet. Students were not permitted to identify as both Black and White. We calculated the percentage of Black and White students suspended in and out of school in 2020-21 by dividing the number of Black students suspended by the total number of Black students in the district and dividing the number of White students suspended by the total number of White students in the district. A two-sample z-test of proportion in Excel was

used to compare Black and White students, as our data was primarily in proportions.

We also collected data from the Florida Department of Education Office of Safe Schools to test our second hypothesis (24). In an Excel spreadsheet, the data regarding the number of in-school and out-of-school suspensions for Black and White students in CCPS for the 2013-14 school year was entered.

Data from the Collier County Public Schools Data Profile for 2013-14 was then collected to determine the number of Black and White students enrolled in the district (25). This data was entered by race as a percentage of total district students on the same spreadsheet. Students were not permitted to identify as both Black and White. The percentage of Black and White students suspended in and out of school in 2013-14 was calculated by dividing the number of Black students suspended by the total number of Black students in the district and dividing the number of White students suspended by the total number of White students in the district. The data for Black and White students was compared using a two-sample z-test of proportion.

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REFERENCES

- Adams, A. Troy "The Status of School discipline and Violence" *American Academy of Political and Social Science*, vol. 567, no. 1, 1 Jan. 2000, pp. 140-156, <https://doi.org/10.1177/0002716200567001010>.
- O'Brien, Diane M. "In-School Suspension: Is It the New Way to Punish Productively?." *American School Board Journal*, vol. 163, no .3, Mar. 1976, pp. 35-37, eric.ed.gov/?id=EJ132549.
- Wallace Jr., John M, *et al.* "Racial, Ethnic, and Gender Differences in School Discipline among U.S. High School Students: 1991-2005." *The Negro Educational Review* vol. 59, no. 1-2, 2008, pp. 47-62, www.ncbi.nlm.nih.gov/pmc/articles/PMC2678799/.
- Smith, Edward J., and Shaun R. Harper. "Disproportionate impact of K-12 school suspension and expulsion on Black students in southern states." *Penn Graduate School of Education Center for the Study of Race and Equity in Education*, 2015, pp. 178-195.
- Reed, Kelsie N., *et al.* "Promoting statewide discipline reform through professional development with administrators." *Preventing School Failure: Alternative Education for Children and Youth*, vol. 64, no. 2, 23 Jan. 2020, pp. 172-182, <https://doi.org/10.1080/1045988X.2020.1716674>.
- Carter, Prudence L., *et al.* "You can't fix what you don't look at: Acknowledging race in addressing racial discipline disparities." *Urban Education* vol. 52, no.2, 1 Feb. 2017, pp. 207-235, <https://doi.org/10.1177/0042085916660350>.
- Wald, Johanna, and Daniel J. Losen. "Out of sight: The journey through the school-to-prison pipeline." *Invisible Children in the Society and its Schools*, 3rd ed.,

- Routledge, 2007, pp 23-27.
8. Skiba, Russell J., *et al.* "Race is not neutral: A national investigation of Black and Latino disproportionality in school discipline." *School Psychology Review*, vol. 40, no. 1, 2011, pp. 85-107, <https://doi.org/10.1080/02796015.2011.12087730>.
 9. Losen, Daniel J., and Tia. E. Martinez. "Out of school and off track: The overuse of suspensions in American middle and high schools.", 8 Apr. 2013, escholarship.org/uc/item/8pd0s08z.
 10. Balfanz, Robert, *et al.* "Sent home and put off-track: The antecedents, disproportionalities, and consequences of being suspended in the ninth grade." *Journal of Applied Research on Children: Informing Policy for Children at Risk*, vol. 5, no. 2, 2014, pp. 13, <https://doi.org/10.58464/2155-5834.1217>.
 11. Blake, Jamilia J., *et al.* "Unmasking the inequitable discipline experiences of urban Black girls: Implications for urban educational stakeholders." *The Urban Review*, vol. 43, no.1, Mar. 2011, pp. 90-106, <https://doi.org/10.1007/s11256-009-0148-8>.
 12. Losen, Daniel J., *et al.* "Are we closing the school discipline gap?." *UCLA: The Civil Rights Project / Proyecto Derechos Civiles*, 23 Feb. 2015. escholarship.org/uc/item/2t36g571.
 13. Morris, Edward W., and Brea L. Perry. "Girls behaving badly? Race, gender, and subjective evaluation in the discipline of Black girls." *Sociology of education*, vol. 90, no. 2, 1 Feb. 2017, pp. 127-148, <https://doi.org/10.1177/0038040717694876>.
 14. Archer-Banks, Diane AM, and Linda S. Behar-Horenstein. "Ogbu revisited: Unpacking high-achieving Black girls' high school experiences." *Urban Education*, vol. 47, no. 2, Jan. 2012, pp. 198-223, <https://doi.org/10.1177/0042085911427739>.
 15. Skiba, Russell J., *et al.* "The color of discipline: Sources of racial and gender disproportionality in school punishment." *The Urban Review*, vol. 34, no.4, Dec. 2002, pp. 317-342, <https://doi.org/10.1023/A:1021320817372>.
 16. Monroe, Carla R. "Why are "bad boys" always Black?: Causes of disproportionality in school discipline and recommendations for change." *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, vol. 79, no. 1, 2005, pp. 45-50, <https://doi.org/10.3200/TCHS.79.1.45-50>.
 17. Collins, Patricia Hill. *Black sexual politics: Blacks, gender, and the new racism*. Routledge, 1st ed., 2004, <https://doi.org/10.4324/9780203309506>.
 18. Crenshaw, Kimberle W., *et al.* "Black Girls Matter: Pushed out, overpoliced and underprotected." 2015, scholarship.law.columbia.edu/faculty_scholarship/3227.
 19. Noltemeyer, Amity L., Rose Marie Ward, and Caven Mcloughlin. "Relationship between school suspension and student outcomes: A meta-analysis." *School Psychology Review*, vol. 44, no. 2, Jun 2015, pp. 224-240, <https://doi.org/10.17105/spr-14-0008.1>.
 20. Rafa, Alyssa. "Suspension and Expulsion: What Is the Issue and Why Does It Matter? Policy Snapshot." *Education Commission of the States*, Jan. 2018, pp. 1-6, eric.ed.gov/?id=ED581500.
 21. Raffaele Mendez, Linda M. "Predictors of suspension and negative school outcomes: A longitudinal investigation." *New Directions for Youth Development*, no. 99, 2003, pp. 17-33, <https://doi.org/10.1002/yd.52>.
 22. Losen, Daniel J., and Russell J. Skiba. "Suspended education: Urban middle schools in crisis." *UCLA: The Civil Rights Project / Proyecto Derechos Civiles*, 13 Sept 2010, escholarship.org/uc/item/8fh0s5dv.
 23. Ibrahim, Habiba, and Odis Johnson. "School discipline, race-gender and STEM readiness: A hierarchical analysis of the impact of school discipline on math achievement in high school." *The Urban Review*, vol. 52, no.1, Mar. 2020, pp. 75-99, <https://doi.org/10.1007/s11256-019-00513-6>.
 24. Florida Department of Education Office of Safe Schools. "Discipline Data ." 2022, www.fl DOE.org/safe-schools/discipline-data.shtml.
 25. Collier County Public Schools. "District Profile ." 2022, www.collierschools.com/Page/349.
 26. Gagnon, Joseph Calvin, Sungur Gurel, and Brian R. Barber. "State-level analysis of school punitive discipline practices in Florida." *Behavioral Disorders*, vol. 42, no. 2, Apr. 2017, pp. 65-80, <https://doi.org/10.1177/0198742916688652>.
 27. Griffin, Charity Brown, *et al.* "Racial fairness, school engagement, and discipline outcomes in Black high school students: The important role of gender." *School Psychology Review*, vol. 49, no. 3, 19 Jun. 2020, pp. 222-238, <https://doi.org/10.1080/2372966X.2020.1726810>.
 28. Mattison, Erica, and Mark S. Aber. "Closing the achievement gap: The association of racial climate with achievement and behavioral outcomes." *American Journal of Community Psychology*, vol. 40, no. 1, Sep. 2007, pp. 1-12, <https://doi.org/10.1007/s10464-007-9128-x>.
 29. Gershoff, Elizabeth T., and Susan H. Bitensky. "The case against corporal punishment of children: Converging evidence from social science research and international human rights law and implications for U.S. public policy." *Psychology, Public Policy, and Law*, vol. 13, no. 4, 2007, pp. 231, <https://doi.org/10.1037/1076-8971.13.4.231>.

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