Hammill Institute on Disabilities

Behavioral Disorders
2018, Vol. 44(1) 40–52

DOI: 10.1177/0198742918773438
journals.sagepub.com/home/bhd
SAGE

Examination of American Indian/Alaska Native School Discipline Disproportionality Using the Vulnerable Decision Points Approach

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Abstract

The present study examined the extent to which racial disproportionality in office discipline referrals (ODRs) exists between American Indian/Alaska Native (AIAN) and White students in elementary (n = 140), middle (n = 67), and high (n = 48) schools. A multilevel logistic regression model was applied to examine overall levels of ODR disproportionality. For school levels with significant disproportionality, patterns of ODRs were analyzed to examine disproportionality of subjectively defined ODRs within the contexts of (a) student ethnicity, (b) time of day, (c) location, (d) severity of problem behavior, and (e) student gender. Results showed a sizable difference in subjective ODRs between AIAN and White students at the high school level.

Keywords

disproportionate representation, behavioral, interventions, positive behavioral supports

American Indian/Alaska Native (AIAN) students have historically been underrepresented in educational research and overrepresented in poor educational outcomes. Scholars have suggested that these outcomes may be due, in part, to the incongruence between American Indian cultures and school systems largely influenced by European cultures (Pewewardy, 2002; Pewewardy & Hammer, 2003). The United States has a dark history of using the education system to suppress American Indian culture. This history began in the 1600s with a Christian movement to use instruction to "civilize" AIAN youth and continued with the formal establishment of boarding schools in 1869 (Smith, 2004). These educational settings were used to assimilate AIAN students into the dominant culture, with little regard for their cultural background (U.S. Senate, 1969). Harsh means of discipline were often used to accomplish this goal (Meriam & Work, 1928). A proposed policy from Harry Pancoast, a Philadelphia lawyer, in 1882 provides an adequate summary of the governmental view of American Indian culture at the time, "We must either butcher them or civilize them, and what we do we must do quickly" (Smith, 2004, p. 99).

The boarding school movement and the attempt to "civilize" American Indian culture may have contributed to the enduring negative outcomes for AIAN youth that we see today. When educational outcomes for AIAN students are compared with students from all other racial/ethnic groups, the contrast is striking. AIAN students are at a much higher risk for dropout, suicide, substance abuse, and involvement in juvenile justice systems than their nonnative counterparts (Faircloth & Tippeconnic, 2010; Rolnick & Arya, 2008). In addition, AIAN students have the highest rates of special education identification (17% of AIAN student population) compared with other racial groups (15% of Black, 13% of White, 12% of Hispanic, 12% of two or more races, 11% of Pacific Islander, and 4% of Asian student populations; Kena et al., 2016).

AIAN disproportionality is also reflected in their levels of academic achievement. In the United States, AIAN students score significantly lower on tests of academic achievement than White students. In 2015, 26% of AIAN students were proficient in reading, compared with 45% of White students, and 30% of AIAN students were proficient in math, compared with 47% of White students (National Center for Education Statistics, 2015). AIAN students were also less likely to obtain a high school diploma (AIAN = 84%, White = 97%), an associate's degree (AIAN = 17%, White = 54%), and a bachelor's degree (AIAN = 10%,

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White = 43%; National Center for Education Statistics, 2016). These achievement statistics are deeply concerning and are not an anomaly. For decades, there has been an achievement gap between AIAN and White students, and this gap continues to widen (National Center for Education Statistics, 2015, 2016).

AIAN Disproportionality in School Discipline

One potential contributor to educational disparities between AIAN and White students may be related to the overuse of exclusionary discipline practices, such as office discipline referrals (ODR), in-school suspensions (ISS), out-of-school suspensions (OSS), and expulsions (Gregory, Skiba, & Noguera, 2010). The negative impact of these practices on outcomes for students and their peers has been well documented. Students who experience high rate of exclusionary discipline are more likely to have future discipline problems, drop out of school, and end up in the juvenile justice system (Ekstrom, Goertz, Pollack, & Rock, 1986; Nicholson-Crotty, Birchmeier, & Valentine, 2009; Tobin & Sugai, 1999; Tobin, Sugai, & Colvin, 1996). In addition, schools with high rates of exclusionary discipline have poorer ratings of school climate and governance, and lower levels of academic achievement (American Psychological Association, 2006). Despite extensive research on the negative impact of exclusionary discipline, few studies have examined the extent discipline disproportionality exists for AIAN populations.

Most of the research effort on disproportionality in school discipline to date has focused on the comparison of African American students with White students (e.g., Girvan, Gion, McIntosh, & Smolkowski, 2017; Skiba et al., 2011), with few studies examining the extent to which AIAN students experience exclusionary discipline at disproportionate rates compared with other racial groups. A total of six studies to date have examined the extent of disproportionality in school discipline for AIAN students (see Table 1). Most of these studies indicate at least slightly increased risk for disproportionate discipline for AIAN students, but the results are mixed (i.e., Brown & Di Tillio, 2013; Greflund, McIntosh, Mercer, & May, 2014; Whitford, 2017; Whitford & Levine-Donnerstein, 2014). In addition, these reviewed studies examined only overall disproportionality and did not include additional variables needed to identify specific patterns in AIAN disproportionality that might indicate which factors may contribute to increased rates of discipline disproportionality.

Research Gaps

The previous research on AIAN school discipline disproportionality leaves two specific gaps to be filled. First, the research to date has not included a sample of students across geographic locations and multiple grade levels. This sampling is problematic, considering conflicting findings regarding AIAN disproportionality across the studies reviewed. A sample of participants disaggregated by school level from a large national dataset may provide insight into understanding the extent of the problem across multiple contexts. Examining disproportionality by school level also may provide insights into how pervasive the problem is and specific contexts in which intervention supports may have the largest impact on increasing equity in school discipline.

Second, none of the studies to date have included contextual factors in their examination of the extent of AIAN disproportionality in school discipline. Previous research has identified overall rates of disproportionality for various types of exclusionary discipline (see Table 1), but has not examined which factors are associated with increased or decreased discipline disproportionality. Alternatively, African American school discipline disproportionality research has examined various factors that may be contributing to the inequities in exclusionary discipline for this population. For example, Bradshaw, Mitchell, O'Brennan, and Leaf (2010) and Skiba et al. (2014) studied the relation between type and intensity of behavioral infractions, socioeconomic status, and school characteristics (e.g., school size, socioeconomic status), in addition to race, to get a more robust understanding of a multifaceted problem.

Vulnerable Decision Points (VDP)

A misunderstanding of disproportionality is that it is a unidimensional process caused solely by explicit bias (e.g., racism). Previous research contradicts this view, and instead seems to suggest that it is much more likely that disproportionality is multidimensional (e.g., Skiba et al., 2011). It seems that disproportionality is more likely to be a product of unconscious implicit biases that are moderated by different factors within the educational environment. Thus, providing a blanket statement about why discipline disproportionality is occurring seems to be inappropriate. A better approach may be to understand the specific conditions which make educators more "vulnerable" to biased decision making.

The VDP model is a process that can be used to identify specific situations where increased disproportionality is more likely to occur (McIntosh, Girvan, Horner, & Smolkowski, 2014). Because exclusionary discipline decisions often occur quickly when emotions are high, educators may benefit from an intervention model that makes exclusionary discipline decisions more conscious. The VDP model may help educators use data to become aware of (a) situations where they are more prone to implicit bias in discipline decision making and (b) elements of the school environment that are poorly matched to student needs and could be revised.

Research has supported preliminary validation of the VDP model with African American students in elementary schools. Smolkowski, Girvan, McIntosh, Nese, and Horner

Table 1. Summary of School Discipline Disproportionality Research for AIAN Student Populations.

Study	Sample	Key findings
Brown and Di Tillio (2013)	• Academic year: 2010–2011 • *N* = 285, 329 incidents • 589 K–12 districts in Arizona	• AIAN students were 2.17 times more likely to receive an ODR than Latino students and 2.98 times more likely than White students. • AIAN students were 1.14 times more likely to be expelled that White students and 1.24 times more likely than Latino students. • AIAN students risk ratios of receiving ODR, ISS, and OSS were roughly on par with African American students (ODR = 0.94, ISS = 0.92, and OSS = 0.92). • African American students were at highest risk when compared with all other racial groups in terms of ODR, ISS, OSS, and expulsions.
Greflund, McIntosh, Mercer, and May (2014)	• Academic year: 2010-2012 • *N* = 1,750 students • Four elementary schools and one middle school in Canada	• Aboriginal students' risk ratios of receiving ODRs (0.96) and subjective ODRs (0.89) were roughly on par with non-Aboriginal students. • Aboriginal students were 1.33 times more likely to receive suspensions and 1.82 times more likely to receive harsh consequences for misbehavior than non-Aboriginal students.
Krezmien, Leone, and Achilles (2006)	• Academic year: 1995–2003 • All K–12 public school students in Maryland (*N* not indicated)	• Suspension odds ratios for AIAN students compared with White students increased from <1.0 in 1995 to >1.5 in 2003. • Only racial group with a higher odds ratio in 2003 was African American students (>2.0), all other racial groups had odds ratios of <1.0. • AIAN and African American populations were the only groups to see an increase in odds ratios over this timespan.
Vincent, Sprague, and Tobin (2012)	• Academic year: 2009–2010 • *N* = 64,088 students • 1,195 schools (Grades K–12) from one state in the Pacific Northwest	• AIAN students were significantly more likely to be cited for truancy, receive ISS or OSS, be expelled, and be removed from the general education environment and placed in alternative education settings when compared with White students. • AIAN students without disabilities were second behind African American students in days lost due to exclusionary discipline, and were third behind African American and Latino students in days lost due to exclusionary discipline for students with disabilities. • 26% of African American students and 10% of White students experienced out-of-school suspension for first violation (Student Level Risk Ratio = 2.6) • Controlling for other factors, African American students were 31% more likely to experience discretionary discipline violation than White students but 23% less likely to experience mandatory discipline. (African American/White Risk Ratio of discretionary versus mandatory discipline actions = 1.18)
Wallace, Goodkind, Wallace, and Bachman (2008)	• Academic year: 1991–2005 • *N* = Approximately 74,000 Grade 10 students • Survey data collected throughout the United States	• AIAN students were more likely to receive an ODR or detention than any other racial group. • AIAN students were second behind African American students to most likely be suspended or expelled from school. • AIAN students were approximately twice as likely to receive an ODR or detention than White students. • AIAN students were 1.7 to 2.6 times more likely to be suspended or expelled from school when compared with White students.
Whitford (2017)	• Academic year: 2011–2012 • *N* = 1,612 Grades K–12 students with disabilities • Two districts (17 schools) in Arizona	• White students with disabilities were 1.29 times more likely to receive one ODR, 1.01 times more likely to receive two to five ODRs, and 0.69 times less likely to receive six or more ODRs than AIAN students with disabilities. • Latino students with disabilities were 0.68 times less likely to receive one ODR, 0.90 times less likely to receive two to five ODRs, and 0.83 times less likely to receive six or more ODRs than AIAN students with disabilities. • Black students with disabilities were 3.04 times more likely to receive one ODR, 2.90 times more likely to receive two to five ODRs, and 2.50 times more likely to receive six or more ODRs than Latino students with disabilities. • White students with disabilities were 1.44 times more likely to receive ISS and 0.63 times less likely to receive OSS for an ODR than AIAN students with disabilities. • Latino students with disabilities were 0.96 times less likely to receive ISS and 0.63 times less likely to receive OSS for an ODR than AIAN students with disabilities. • Black students with disabilities were 1.20 times more likely to receive ISS and 1.13 times more likely to receive OSS for an ODR than AIAN students with disabilities.
Whitford and Levine-Donnerstein (2014)	• Academic year: 2010–2011 • *N* = 9,330 Grades Pre-K–12 students • Two districts (14 schools) in Arizona	• AIAN students were 1.92 times more likely to receive an ODR than White students, 1.93 times more likely than Latino students, 2.45 times more likely than Asian students, and 0.56 times less likely than African American students. • AIAN students were 1.24 times more likely to receive a referral for defiance, disrespect, or noncompliance than White students and 1.93 times more likely when compared with Latino students. • AIAN students were 1.23 times more likely to receive a referral for aggression than White students and 1.72 times more likely when compared with Latino students. • AIAN students were 1.35 times more likely to receive a referral for aggression than White students and 1.58 times more likely when compared with Latino students.

Note. AIAN = American Indian/Alaska Native; ODR = office discipline referrals; ISS = in-school suspensions; OSS = out-of-school suspensions.

(2016) found increased disproportionality in the ratio of subjective to objective ODRs for African American male and female students in classrooms, for major problem behavior, and in the first 90 min of the school day. These conditions are likely to vary depending on various factors that contribute to discipline disproportionality, and an examination of the appropriateness of the VDP model for other student groups and other grade levels is needed. Our approach in this study is to replicate the Smolkowski et al. (2016) study to guide the identification of the conditions that make disproportionality more likely for AIAN students.

Purpose of This Study

In this study, we investigated AIAN ODR disproportionality with the VDP model. The purpose was to examine the extent of disproportionality for AIAN students on a national scale. This model examines significant disproportionality for AIAN students and the conditions suggested by the VDP model that make AIAN ODR disproportionality more likely. We sought to identify how disproportionality is manifested across elementary, middle, and high schools by time of day, location, incident severity, and gender. The specific research questions to be answered in this study were the following:

Research Question 1 (RQ1): To what extent is there AIAN–White disproportionality in school discipline at each school level (i.e., elementary, middle, high) for all ODRs?

Research Question 2 (RQ2): To what extent is there AIAN–White disproportionality in school discipline for subjectively defined ODRs relative to objectively defined ODRs at the elementary, middle, and high school levels?

Research Question 3 (RQ3): Where significant disproportionality does exist, is it stronger early versus the end of school day, inside versus outside of the classroom, for major versus minor referral types, and for male versus female students?

Method

Participants and Settings

Data for this study were derived from an extant database of ODRs. This study included ODRs issued in 2011–2012 to 56,150 students by 9,314 educators across 140 elementary schools, 67 middle schools, and 48 high schools using the *School-Wide Information System* (SWIS; May et al., 2013), an online computer application for tracking and analyzing ODRs. Schools using SWIS have the option to sign a data-sharing agreement that allows their data to be used for research purposes. ODR data from schools who signed the data-sharing agreement were extracted from the SWIS database.

The average enrollment for the schools was 467 (SD = 178) for elementary schools, 676 (SD = 258) for middle schools, and 1,087 (SD = 625) for high schools. The average percentage of students receiving free or reduced-price meals for elementary was 57% (SD = 23%), middle 52% (SD = 22%), and high 46% (SD = 17%). The average percentage of non-White elementary students was 32% (SD = 24%), middle 35% (SD = 26%), and high 29% (SD = 24%). The average percentage of AIAN elementary students in each school was 10% (SD = 13%), middle 9% (SD = 15%), and high 9% (SD = 18%).

Restrictions were placed on the sample to ensure an adequate representation of diversity was present to be analyzed. These restrictions were similar to the analysis of ODRs for African American and White students previously published (Smolkowski et al., 2016). We included only schools that coded race or ethnicity for at least 80% of ODRs and with at least 10 AIAN and 10 White students to avoid using estimates from schools with little to no racial diversity. For the present analysis, we included only ODRs delivered to AIAN or White students to narrow our focus to the most common comparison for disproportionality (Skiba et al., 2011).

Measures

ODRs. ODRs are standardized forms used to document events that school personnel determine to be behavior violations (Sugai, Sprague, Horner, & Walker, 2000). They are completed and entered into a data system (e.g., SWIS) by school personnel. SWIS ODRs have previously been examined to show they are adequately reliable and valid indicators of problem behavior (Irvin, Tobin, Sprague, Sugai, & Vincent, 2004; McIntosh, Campbell, Carter, & Zumbo, 2009; Walker, Cheney, Stage, Blum, & Horner, 2005). All ODRs entered into SWIS include the severity of the ODR (i.e., major vs. minor), the type of problem behavior (e.g., defiance, fighting, dress code violation), the location of the problem behavior, the time the problem behavior occurred, and the demographic characteristics of the student (e.g., gender, ethnicity, grade level). In this study, we used the information of ethnicity (i.e., AIAN vs. White), problem behavior type (i.e., subjective vs. objective), time of day (i.e., earlier vs. end of day), location (i.e., classroom vs. other settings), severity (i.e., minor vs. major), and gender (i.e., male vs. female) to identify specific situations where AIAN disproportionality may be more likely (i.e., VDPs).

Subjectivity of ODRs. The classification of ODRs as subjectively or objectively defined has been completed through previous research. Greflund et al. (2014) used an expert panel, composed of researchers in school discipline, racial or ethnic disproportionality, or culturally responsive behavior support, who rated the specific SWIS behavior definitions used for ODRs. Each ODR behavior

type was classified as either subjective (e.g., defiance) or objective (e.g., truancy) by an expert panel. ODRs for behaviors in which the expert panel did not agree on a classification (e.g., dress code violation) were removed from analyses.

Severity of ODRs. In SWIS, ODRs are classified into two categories: major and minor. School personnel determine whether a problem behavior is major (i.e., needs administrative action) or minor (i.e., can be handled in the classroom or by the immediate adult). Most ODRs, and all subjective ODRs, can be classified as either major or minor; exceptions include certain major behaviors that pose safety concerns (e.g., arson, bomb threat).

School-level variables. School characteristics included in analyses were the proportion of students receiving free and reduced-price lunch, the proportion of AIAN students, and the proportion of students of color other than AIAN. These data were obtained from the National Center for Educational Statistics (NCES) and used as covariates to control for their influence on ODR patterns. These variables were assumed to be potential contaminants of the variables under investigation but not associated with their underlying constructs (Spector & Brannick, 2011).

Analytic Plan

Overall disproportionality for all ODRs (RQ1). Descriptive analyses were used to examine the extent of AIAN ODR disproportionality at each grade level for both subjectively defined and objectively defined ODRs. School-level risk ratios (RR) were generated for the first research question to provide a descriptive overview of AIAN ODR disproportionality at each grade level. School-level RRs were calculated at each level using the following equation:

$$\mathrm{RR}_{\mathrm{Sch}} = \frac{\left(\frac{\text{No. of AIAN students with any ODRs}_{\mathrm{Sch}}}{\text{Total no. of AIAN students}_{\mathrm{Sch}}}\right)}{\left(\frac{\text{No. of White students with any ODRs}_{\mathrm{Sch}}}{\text{Total no. of White students}_{\mathrm{Sch}}}\right)}.$$

School-level RRs indicate the likelihood of a student from a given population receiving an ODR at that school. They are easily interpretable and are commonly used to assess the breadth of disproportionality across students (e.g., Brown & Di Tillio, 2013). For example, a school-level RR of 2.0 for AIAN compared with White students indicates that an AIAN student is 2 times more likely to receive one or more ODRs than a White student. If student enrollments were equal and 10 White students received an ODR in our sample, 20 AIAN students would have also received an ODR.

Odds and odds ratios (ORs). To assess the odds and ORs associated with ODRs, we conducted a series of multilevel logistic regression models. The models predicted subjectivity of ODR events (subjective = 1 vs. objective = 0) and included two sources of random variation, the educator and schools. We fit an unconditional, school-level covariates model, and AIAN-plus-covariates model, as well as four additional models, each for the interaction between one hypothesized VDP (end of day, classroom, major ODR) or student gender and AIAN. The first three models and each of the final four represented a nested set of models, and the analysis and results details below assume this progression of models. The names of the predictors denote the event (coded 1) compared with the converse (coded 0). The AIAN predictor, then, is 1 for ODRs provided to AIAN students and 0 for White students. Similarly, the classroom predictor is coded 1 for ODRs delivered in classrooms and 0 in other settings. We present the full model results in the supplemental appendix available online (Tables A1-A3; see table notes for model comparisons). See Smolkowski et al. (2016) for additional analysis details.

Interpretation of coefficients. Logistic regressions are particularly useful to examine disproportionality because the results allow the calculation of ORs, a form of effect size, from the raw parameter estimates (Judge & Cable, 2004). A raw logistic coefficient by itself is not easily interpretable, but it can be converted into an OR to provide context about the extent of disproportionality. If the subjectivity model produced a raw logistic regression coefficient for AIAN of 0.27, then the OR = $e^{0.27}$ = 1.31, indicating that AIAN students are 1.31 times more likely than White students to receive a subjective ODR relative to an objective ODR. The OR is an estimate of the increase in odds per unit change of the predictor. To illustrate this example further, if a school had 100 White students and 100 AIAN students and White students received a total of 20 subjective ODRs, an OR of 1.5 would indicate AIAN students would have received a total of 30 subjective ODRs (i.e., 1.5 times more). An OR of 1 indicates that AIAN and White students are equally likely to receive a subjective ODR, whereas an OR of 2.0 indicates that the outcome is twice as likely, and an OR of 0.5 indicates that the outcome is half as likely. The OR for AIAN students is our primary indicator of disproportionality.

Disproportionality for subjectively defined ODRs (RQ2). We first examined the relative odds of an ODR for a subjectively defined behavior versus an objectively defined behavior. To assess this research question, we tested whether AIAN students were more likely than White students to receive a subjective versus objective ODR. For ease of interpretation when describing the analysis and results, we refer to this outcome as the odds of a subjective ODR or just use the term *subjective ODR*.

Table 2. AIAN–White Risk Ratio Percentiles [in Brackets] for Elementary, Middle, and High Schools.

School level	Number of schools	Student risk ratio percentile [25th, 50th, 75th]
Elementary	140	[0.10, 0.64, 1.26]
Middle	67	[0.46, 1.06, 1.46]
High	48	[0.70, 1.20, 1.79]

Disproportionality for subjectively defined ODRs by VDP (RQ3). To identify potential VDPs that make disproportionality more likely to occur, predictors of (a) AIAN and end of day, (b) AIAN and classroom, (c) AIAN and major ODR, and (d) AIAN and female were added to the analysis. Because ODRs were collected from different educators in different schools, we also included these two sources of random variation into all models (i.e., ODRs were nested within educators and schools).

Determining OR significance. In the United States, each state is left to determine its own criterion for significant racial disproportionality in education (U.S. Government Accountability Office, 2013), leaving little guidance for those seeking a benchmark for meaningful differences. To determine this threshold, we used the *four-fifths rule* or *80% rule* used by the Department of Justice and Equal Employment Opportunity Commission (EEOC) to identify employment practices that result in "serious discrepancies" based on race or other protected classes (EEOC, U.S. Civil Service Commission, U.S. Department of Labor, & U.S. Department of Justice, 1978). The four-fifths rule has also been used in previous research examining disproportionality using the VDP model (Smolkowski et al., 2016). The rule translates to an OR of 1.25 or greater or, equivalently, 0.80 or less. In our previous example, a school with 100 White and 100 AIAN students, an OR of 1.25 would indicate that AIAN students are 25% more likely to receive a subjective ODR than White students. For every 20 White students receiving subjective ODRs in this school, there would be 25 AIAN students who received a subjective ODR. Thus, we considered ORs equal to or outside of the interval (0.80, 1.25) to be especially problematic, consistent with previous research and EEOC recommendations.

Traditional statistical significance can be determined from the confidence intervals presented in the results tables. When the 95% confidence bounds exclude 1.0, the association is statistically significant at the .05 level. All interpreted ORs were statistically significant. We prefer the four-fifths rule, however, for its legal and policy significance.

Results

Overall Disproportionality for All ODRs (RQ1)

We provided RRs for AIAN versus White students by school level at the 25th, 50th, and 75th sample percentiles in Table 2 for descriptive purposes. Only elementary schools had an overall school-level RR that met the four-fifths rule (i.e., ≤0.80 or ≥1.25), which indicated underrepresentation of AIAN elementary students receiving any type of ODR. The 75th percentiles show that a substantial number of schools in this sample met the four-fifths rule (i.e., RR ≥ 1.25) for AIAN overrepresentation in ODR disproportionality, although a large number also indicated underrepresentation of AIAN students with ODRs (below the 25th percentile).

Table 3. AIAN–White Subjective Referral ORs for Elementary, Middle, and High Schools.

School level	OR	95% CI		Four-fifths rule
		Lower	Upper	
Elementary	0.81	0.74	0.89	↔
Middle	1.24	1.09	1.41	↔
High	1.31	1.09	1.58	>

Note. OR = odds ratio; CI = confidence interval.

Disproportionality for Subjectively Defined ODRs (RQ2)

Table 3 describes the ORs for AIAN versus White students receiving subjectively defined ODRs at each grade level. In this analysis, elementary and middle school mean ORs were between 0.80 and 1.25, indicating nonsignificant disproportionality at these grade levels. Only high schools met the four-fifths rule for AIAN overrepresentation (i.e., OR ≥ 1.25) in subjective ODR disproportionality, indicating the potential need to assess the presence of VDPs.

Disproportionality for Subjectively Defined ODRs by VDP (RQ3)

Based on the results for RQ2, we continued with VDP analyses for high schools and provided VDP tables for reference at the elementary and middle school levels. The VDP analysis included four models that examined the interaction between AIAN and each of four additional predictors: end of day, classroom, major ODR, and female. Tables 4 through 6 summarize the results of the models with odds or ORs, with each of the four VDP models presented in a separate section of each table. The rows of each table that describe a subgroup give the odds of a subjective ODR. For example, the odds of a White student receiving an ODR earlier in the day were 7.70 (first line in Table 4); the odds for a White student receiving an ODR at the end of the day were 9.24. The rows that compare two groups have terms separated by a colon and provide ORs. The OR for a White student receiving an ODR at the end of the day versus earlier is 1.20 (third row of Table 4), which equals the quotient of the first two rows (9.24 / 7.70

Table 4. High School Students' Odds and ORs of Subjective Referral for Specific Contrasts Between AIAN Versus White Students and Three Vulnerable Decision Points and Student Gender Estimated From Multilevel Logistic Regression.

Analysis focus	Student race	Vulnerable decision point or student gender	Odds or OR	95% CI		Four-fifths rule
				Lower	Upper	
Time of day	White	Earlier	7.70	5.48	10.83	
	White	End of day	9.24	6.42	13.28	
	White	End of day: Earlier	1.20	1.03	1.40	↔
	AIAN	Earlier	9.40	6.49	13.61	
	AIAN	End of day	20.38	12.49	33.25	
	AIAN	End of day: Earlier	2.17	1.49	3.16	>
	AIAN: White	Earlier	1.22	0.99	1.50	↔
	AIAN: White	End of day	2.21	1.48	3.28	>
	AIAN: White	End of day: Earlier	1.81	1.21	2.71	>
Location	White	Other settings	10.17	7.13	14.51	
	White	Classroom	7.35	5.22	10.34	
	White	Classroom: Other	0.72	0.64	0.82	<
	AIAN	Other settings	8.68	5.71	13.19	
	AIAN	Classroom	11.72	8.04	17.07	
	AIAN	Classroom: Other	1.35	1.01	1.81	>
	AIAN: White	Other settings	0.85	0.64	1.13	↔
	AIAN: White	Classroom	1.60	1.29	1.97	>
	AIAN: White	Classroom: Other	1.87	1.37	2.55	>
Referral	White	Minor	4.91	3.41	7.06	
	White	Major	12.55	8.72	18.08	
	White	Major: Minor	2.56	2.27	2.88	>
	AIAN	Minor	5.96	3.96	8.97	
	AIAN	Major	17.40	11.59	26.11	
	AIAN	Major: Minor	2.92	2.21	3.86	>
	AIAN: White	Minor	1.21	0.95	1.55	↔
	AIAN: White	Major	1.39	1.10	1.74	>
	AIAN: White	Major: Minor	1.14	0.85	1.53	↔
Gender	White	Male	9.04	6.44	12.69	
	White	Female	5.76	4.08	8.13	
	White	Female: Male	0.64	0.58	0.70	<
	AIAN	Male	11.93	8.22	17.30	
	AIAN	Female	7.64	5.09	11.46	
	AIAN	Female: Male	0.64	0.49	0.84	<
	AIAN: White	Male	1.32	1.08	1.62	>
	AIAN: White	Female	1.33	1.01	1.74	>
	AIAN: White	Female: Male	1.01	0.75	1.34	↔

Note. This table provides the odds or OR from specific contrasts created from the models in the supplemental appendix. For rows that contain singular terms (e.g., White, AIAN, Classroom, or Minor), the table reports information about the odds of subjective referral relative to an objective referral. For rows that contain comparison (e.g., AIAN: White, Major: Minor), the cells provide information about OR. Confidence intervals that exclude 1.0 indicate a statistically significant result. The four-fifths rule indicates whether a particular OR equals or exceeds (>) four-fifths (1.25), its reciprocal (<0.80), or does not meet the four-fifths rule (↔). OR = odds ratio; AIAN = American Indian/Alaska Native; CI = confidence interval.

= 1.20). We have also included a graphic representation (see Figure 1) to allow for a clearer interpretation of VDPs at the high school level (see supplement, Table A1). Tables 5 and 6 are included for interpretation of the results presented in Tables A2 and A3.

End of day. As shown in Table 4, the odds increase for both White and AIAN students at the end of the day. The last two rows provide ORs associated with AIAN versus White students for either early in the day or the end of day. Earlier in the day, AIAN high school students were 1.22 times more likely than White students to receive a subjective ODR. Near the end of the day, however, AIAN high school students were 2.21 times more likely than White students to receive a subjective ODR. This finding meets the criteria for disproportionality according to the four-fifths rule.

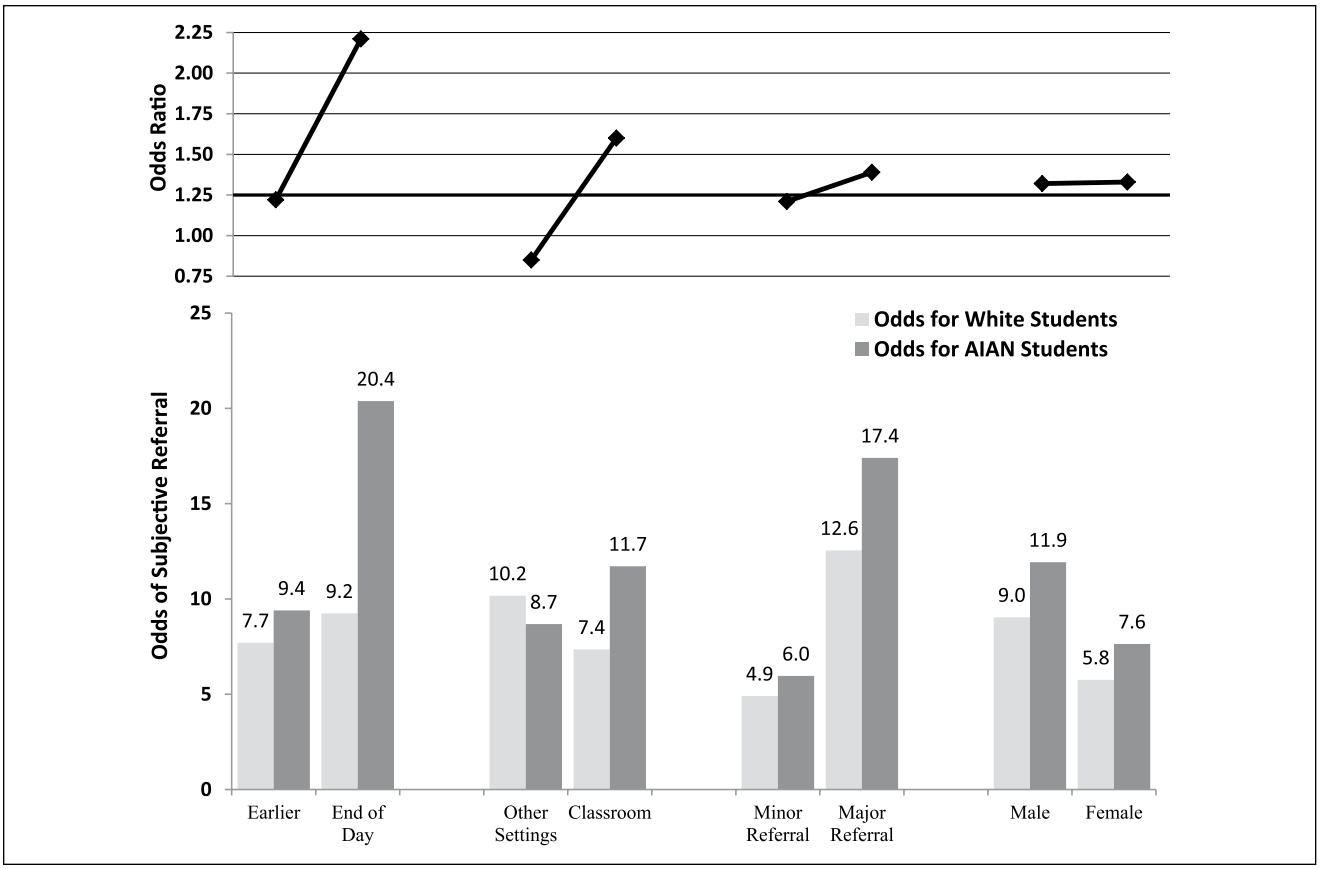

Figure 1. Graph of odds (lower) and ORs (upper) for AIAN students in high schools.
Note. The columns at the bottom represent the average odds of an ODR for a subjectively defined versus objectively defined behavior by student race for each clustered condition. The diamonds linked by lines represent the OR within each cluster (data for odds and ORs come from the first column of data in Table 4). ORs of 1 indicate no disproportionality in the clustered condition. The darker horizontal line at an OR of 1.25 indicates the threshold above which we interpret the magnitude of disproportionality to be particularly problematic. OR = odds ratio; AIAN = American Indian/Alaska Native; ODR = Office Discipline Referrals.

Classroom. Continuing with the same approach to interpretation, Table 4 shows that subjective ODRs are 1.60 times more likely to have been issued to AIAN high school students than White high school students in classroom settings, and 0.85 times less likely to receive ODRs in other settings. The model also shows that subjective ODRs were more likely in classrooms (odds = 11.72) than other settings (odds = 8.68) for AIAN students. The opposite pattern is true for White high school students, classroom (odds = 7.35) and other settings (odds = 10.17).

Major ODRs. AIAN high school students were also much more likely to receive major subjective ODRs compared with White students, OR = 1.39. For minor ODRs, the OR associated with AIAN was 1.21, also greater than 1.0, likely representing important levels of disproportionality but below our four-fifths criterion level for indicating a serious problem.

Gender. The results suggest that there was no interaction effect in ORs between AIAN males (OR = 1.32) and females (OR = 1.33), indicating disproportionality was equally likely for both groups.

Discussion

The results of the current research indicate that AIAN students are disproportionally more likely to receive a subjective ODR than White students with increased rates observed for high school students. Overrepresentation of ODR disproportionality for AIAN high school students, and underrepresentation for AIAN elementary students, is consistent with previous research that separates findings by school level (Greflund et al., 2014; Wallace et al., 2008). The finding that ODR disproportionality between AIAN and White students may vary by school level potentially provides a rationale for why research to date shows conflicting findings regarding AIAN disproportionality in school discipline. This study potentially adds more clarity to this issue.

In addition, the results of RQ1 show wide disparities between ODR disproportionality for individual schools at each

Table 5. Middle School Students' Odds and ORs of Subjective Referral for Specific Contrasts Between AIAN Versus White Students and Three Vulnerable Decision Points and Student Gender Estimated From Multilevel Logistic Regression.

Analysis focus	Student race	Vulnerable decision point or student gender	Odds or OR	95% CI		Four-fifths rule
				Lower	Upper	
Time of day	White	Earlier	11.91	8.74	16.22	
	White	End of day	15.63	11.35	21.53	
	White	End of day: Earlier	1.31	1.19	1.45	>
	AIAN	Earlier	14.64	10.55	20.32	
	AIAN	End of day	18.23	12.31	26.99	
	AIAN	End of day: Earlier	1.24	0.95	1.63	↔
	AIAN: White	Earlier	1.23	1.06	1.43	↔
	AIAN: White	End of day	1.17	0.88	1.54	↔
	AIAN: White	End of day: Earlier	0.95	0.71	1.26	↔
Location	White	Other settings	9.79	7.16	13.40	
	White	Classroom	13.07	9.60	17.78	
	White	Classroom: Other	1.33	1.22	1.46	>
	AIAN	Other settings	12.45	8.81	17.60	
	AIAN	Classroom	16.10	11.59	22.36	
	AIAN	Classroom: Other	1.29	1.05	1.59	>
	AIAN: White	Other settings	1.27	1.05	1.54	>
	AIAN: White	Classroom	1.23	1.06	1.44	↔
	AIAN: White	Classroom: Other	0.97	0.78	1.21	↔
Referral	White	Minor	12.25	8.96	16.75	
	White	Major	11.73	8.56	16.07	
	White	Major: Minor	0.96	0.87	1.05	↔
	AIAN	Minor	13.16	9.40	18.43	
	AIAN	Major	17.16	12.17	24.21	
	AIAN	Major: Minor	1.30	1.06	1.61	>
	AIAN: White	Minor	1.07	0.91	1.27	↔
	AIAN: White	Major	1.46	1.22	1.75	>
	AIAN: White	Major: Minor	1.36	1.09	1.70	>
Gender	White	Male	12.99	9.53	17.70	
	White	Female	9.31	6.80	12.76	
	White	Female: Male	0.72	0.66	0.78	<
	AIAN	Male	16.54	11.92	22.96	
	AIAN	Female	11.47	8.08	16.28	
	AIAN	Female: Male	0.69	0.57	0.85	<
	AIAN: White	Male	1.27	1.10	1.47	>
	AIAN: White	Female	1.23	1.01	1.50	↔
	AIAN: White	Female: Male	0.97	0.78	1.20	↔

Note. This table provides the odds or OR from specific contrasts created from the models in the supplemental appendix. For rows that contain singular terms (e.g., White, AIAN, Classroom, or Minor), the table reports information about the odds of a subjective referral relative to an objective referral. For rows that contain comparisons (e.g., AIAN: White, Major: Minor), the cells provide information about ORs. CIs that exclude 1.0 indicate a statistically significant result. The four-fifths rule indicates whether a particular OR equals or exceeds (>) four-fifths (1.25), its reciprocal (<0.80), or does not meet the four-fifths rule (↔). OR = odds ratio; AIAN = American Indian/Alaska Native; CI = confidence interval.

level. There was a substantial number of schools with disproportionality above 1.25 and below 0.80, indicating meaningful overrepresentation and underrepresentation. This finding may also support the idea that ODR disproportionality varies by school and this variation could be contributing to conflicting findings from previous research using smaller sample sizes.

The VDP analyses suggest that, at the high school level, disproportionality is most likely at the end of the school day, in the classroom, for major ODRs, and is similar for both male and female students. These results are consistent with previous VDP research examining these effects for African American elementary students, with two exceptions. Smolkowski et al. (2016) found that disproportionality for subjective ODRs was more likely in the classroom and for major problem behavior, but they also found that disproportionality was more likely earlier in the day and for

Table 6. Elementary School Students' Odds and ORs of Subjective Referral for Specific Contrasts Between American Indian or Alaskan Native (AIAN) Versus White Students and Three Vulnerable Decision Points and Student Gender Estimated From Multilevel Logistic Regression.

Analysis focus	Student race	Vulnerable decision point or student gender	Odds or OR	95% CI		Four-fifths rule
				Lower	Upper	
Time of Day	White	Earlier	12.80	9.58	17.10	
	White	End of day	14.42	10.64	19.55	
	White	End of day: Earlier	1.13	1.01	1.26	↔
	AIAN	Earlier	10.29	7.63	13.87	
	AIAN	End of day	16.91	11.89	24.05	
	AIAN	End of day: Earlier	1.64	1.33	2.04	>
	AIAN: White	Earlier	0.80	0.73	0.89	<
	AIAN: White	End of day	1.17	0.93	1.48	↔
	AIAN: White	End of day: Earlier	1.46	1.15	1.85	>
Location	White	Other settings	11.29	8.45	15.10	
	White	Classroom	16.31	12.17	21.86	
	White	Classroom: Other	1.44	1.32	1.58	>
	AIAN	Other settings	10.57	7.77	14.38	
	AIAN	Classroom	12.01	8.87	16.26	
	AIAN	Classroom: Other	1.14	0.98	1.32	↔
	AIAN: White	Other settings	0.94	0.82	1.07	↔
	AIAN: White	Classroom	0.74	0.66	0.82	<
	AIAN: White	Classroom: Other	0.79	0.67	0.93	<
Referral	White	Minor	15.29	11.42	20.48	
	White	Major	9.93	7.39	13.35	
	White	Major: Minor	0.65	0.59	0.72	<
	AIAN	Minor	11.29	8.36	15.26	
	AIAN	Major	13.10	9.37	18.30	
	AIAN	Major: Minor	1.16	0.95	1.41	↔
	AIAN: White	Minor	0.74	0.67	0.81	<
	AIAN: White	Major	1.32	1.08	1.61	>
	AIAN: White	Major: Minor	1.78	1.44	2.21	>
Gender	White	Male	14.26	10.66	19.07	
	White	Female	10.61	7.89	14.28	
	White	Female: Male	0.74	0.68	0.81	<
	AIAN	Male	11.37	8.43	15.35	
	AIAN	Female	8.96	6.52	12.32	
	AIAN	Female: Male	0.79	0.67	0.92	<
	AIAN: White	Male	0.80	0.72	0.88	<
	AIAN: White	Female	0.84	0.72	0.99	↔
	AIAN: White	Female: Male	1.06	0.89	1.26	↔

Note. This table provides the odds or OR from specific contrasts created from the models in the supplemental appendix. For rows that contain singular terms (e.g., White, AIAN, Classroom, or Minor), the table reports information about the odds of a subjective referral relative to an objective referral. For rows that contain comparisons (e.g., AIAN: White, Major: Minor), the cells provide information about ORs. CIs that exclude 1.0 indicate a statistically significant result. The four-fifths rule indicates whether a particular OR equals or exceeds (>) four-fifths (1.25), its reciprocal (<0.80), or does not meet the four-fifths rule (↔). OR = odds ratio; AIAN = American Indian/Alaska Native; CI = confidence interval.

African American females. The findings for AIAN high school students from this study suggest that disproportionality is more likely at the end of the day and there is not significant ODR differentiation between males or females.

Limitations and Future Directions

This study has several limitations related to the confidence and generalizability of the findings. First, this study examines AIAN ODR disproportionality across schools. Individual school systems seem to vary considerably (see Table 2) in their levels of AIAN ODR disproportionality. Thus, it is likely that disproportionality is represented differently for individual schools, and school teams should test both overall disproportionality and specific VDPs using their school data. Local school data may vary by time of day, location, type of problem behavior, and gender. Thus, it may be more valuable for educational personnel to understand and apply the process for identifying potential

VDPs within their own context, as opposed to planning intervention based on the results of this study. For reference, McIntosh, Barnes, Morris, and Eliason (2014) proposed a four-step guide for using school discipline data to identify potential VDPs and address disproportionality. This process mirrors the well-established four-step problem-solving model used by school teams to address behavior and academic issues (e.g., Newton, Algozzine, Algozzine, Horner, & Todd, 2011). Data-based problem solving involves school teams collecting and using data for (a) problem identification (i.e., Is there a problem?), (b) problem analysis (i.e., Why is it happening?), (c) plan implementation (i.e., What should be done?), and (d) plan evaluation (i.e., Is the plan working?). Researchers and practitioners may want to consult this guide to drive intervention efforts to reduce discipline disproportionality.

Second, this study was correlational in nature, and causal inferences should not be made from these findings. It remains unclear why disproportionality is more likely in high schools and for the VDPs previously mentioned. This study should be used as a piece of information that helps to better identify the mechanisms that may contribute to AIAN ODR disproportionality, and should be used to guide future intervention research to reduce this problem. Future research may want to use the process of identifying VDPs, hypothesize why disproportionality may be occurring, and implement interventions aimed to make exclusionary discipline practices more equitable for all students.

Third, the data used in this study were from extant datasets (i.e., SWIS and NCES). Although these datasets included a large sample of ODRs, there are issues of unknown reliability and a lack of specificity in the data collected. The research questions asked in this study were somewhat constrained by the data available. Additional research may want to include other variables like geographic differences, cultural differences, and school experiences (e.g., Bureau of Indian Education [BIE] schools vs. public schools vs. other) for a more robust examination of AIAN discipline disproportionality. Likewise, considering these findings and limitations, future research may want to investigate deeper into the contextual variables used in this study. For example, examination of major subjective problem behavior types (e.g., defiance, inappropriate language), end of the day contextual variables (e.g., classes, routines), and classroom variables (e.g., teaching pedagogy, classroom management) in greater detail could lead to a more refined problem analysis and effective intervention to improve equity for this student population.

Implications

This study provides additional information beyond the simple analysis of the existence of discipline disproportionality for AIAN students, supporting the theory that disproportionality is multidimensional. This could mean disproportionality is more likely a product of unconscious implicit biases that are moderated by different factors within the educational environment, as opposed to explicit racism, which is encouraging for practice and future intervention research. If disproportionality is indeed a product of environmental factors influencing implicit biases, then efforts to identify when educators are more vulnerable to act on these biases could reduce the effects of discipline disproportionality.

Second, this study suggests that the theory of VDPs driving discipline disproportionality holds for both African American and AIAN student groups. The evidence that disproportionality is not universal (e.g., across grade level, across time of day, across behaviors, across schools) seems to suggest that VDPs may influencing discipline decision making. Thus, the VDP model could be applied across racial groups or other groups experiencing inequities in school discipline (e.g., students with disabilities). A stronger preponderance of evidence is needed to establish the usefulness of the VDP model across groups, but findings so far are encouraging.

Finally, the process of identifying VDPs and manipulating malleable variables within the environment may be a way to reduce disproportionality in school discipline. This is possibly the most encouraging contribution to the literature. Behavioral research has been predicated on the ability to identify environmental factors contributing to behavior and manipulating these factors to produce favorable outcomes. It could be that disproportionality in school discipline is no different. If we can identify the environmental stimuli that contribute to exclusionary discipline decision making, then we can change these structures to make the environment more equitable for all.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The development of this research was supported by the Institute of Education Sciences, U.S. Department of Education (#R324A170034). The opinions expressed are those of the authors and do not represent views of the Office or U.S. Department of Education.

Supplemental Materials

The online supplementary material is available at http://journals.sagepub.com/doi/suppl/10.1177/0198742918773438.

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