As the student population of American schools becomes increasingly diverse, the demographics of America's teachers have not followed suit. In fact, the racial demographic gap between teachers and students has increased. With greater numbers of non-white students each year, nearly every single state in the U.S. has disproportionate numbers of white teachers leading its classrooms (Boser 2014; Grissom, Kern, Rodriguez 2015, 190). Perhaps this disproportion would not be as troubling if educational attainment gap between socio-demographic groups of students did not remain as intractable and large as they are today.

Among often studied metrics of educational attainment and success include college retention and persistence rates – the endogenous or dependent variable of our research question. Specifically, we are interested in applying critical mass theory to examine the impact of teacher and administrator racial diversity at the secondary level on college retention and persistence rates. The subsequent paragraphs will define critical mass theory, review the research behind critical mass theory, cover major studies on college retention and persistence rates, and discuss the connection our research will make between these two fields.

The idea of a 'critical mass' is grounded in the argument that institutional bureaucracies should be demographically representative of the constituents they serve in order to best meet the needs of each social class (Kingsley 1944). In her work focusing on gender representation on teams, Kanter introduces critical mass theory to argue that gender diversity below a threshold of 35% is ineffectual in enhancing team performance because minority members are largely reduced to symbolic representatives, or tokens, of specific social group (1977). The power of the critical mass lies in its solidary, as "minority members are potentially allies, can form coalitions, and can affect the culture of the group" (Kanter 1977, 206). Since then, numerous studies have applied critical mass theory to racial representation and diversity within the field of education – this will be discussed in the following paragraphs.

The full spectrum of ways in which teachers, who share the racial background as their students, positively impact these students is well-documented. Studies applying representative bureaucracy consider teachers as "street-level bureaucrats" and their students as "clients" (Grissom, Kern, Rodriguez 2015, 186). Moving forward we will forgo utilizing this terminology and simply refer to educators and the youth they teach as teachers and students.

In terms of empathy, shared backgrounds between non-white teachers and students may facilitate better communication and help non-white teachers more effectively identify the supports a student needs (Grissom, Kern, Rodriguez 2015, 187). Non-white students may also be more inclined to exert great effort and investment in their schooling for a fellow non-white teacher they view as a role model (Dee 2005, 159; Grissom, Kern, Rodriguez 2015, 187, Cole 1986, 332).

Studies have also uncovered the discretionary power that teachers exert over students of color, but especially black and brown students, when it comes to special education services or gifted program assignment. An observed, "negative association between the proportion of minority teachers and the proportion of minority students in special education" is present (Grissom, Kern, Rodriguez 2015, 188). Fraga, et al. showed that Hispanic students are less likely to be assigned to special education in the presence of larger numbers of Hispanic teachers (1986). On the other end of the spectrum, black students are observed to be three times more likely to be assigned to gifted programs by black teachers than non-black teachers (Grissom & Redding 2016, 10). Evidence has also shown that a critical mass of 20-40% of teachers who are black or Hispanic is required to see a noticeable increase in the number of black and Hispanic students enrolled in talented and gifted programs (Grissom, Rodriguez, Kern 2017; Nicholson-Crotty, Grissom, Nicholson-Crotty 2011, 591). This demonstrates the wide gulf in expectations that teachers, particularly white teachers, hold between white students and non-white students (Papageorge et al. 2016). This divergence has been

shown to further manifest at the classroom-level with implications for student achievement in the future, as it pertains to college-going and retention rates.

Case studies have also shown that as percentage of black teachers increase, the disproportionate discipline of black students decreases; this holds especially true for in-school-suspensions and expulsions (Meier & Stewart 1992). When there is racial mismatch between teacher and student, there is a higher chance of the student being viewed as inattentive or sub-par in their work completion rates (Dee 2005, 162-163). These unintentional and unconscious biases in teachers manifest themselves with insidious consequences. Concrete differences in student outcomes, such as lower drop-outs rates in high school, higher graduation examination passage rates, and higher scores on standardized tests have been observed when teacher representation matches that of students (Pitts 2007, 514; 517; Meier & Stewart 1992, 166). This thus informs the necessity of further studying the long-term consequences of achieving a critical mass of racially diverse teachers. With the scope of research predominately focused on the K-12 years, we must also look towards post-secondary year of education to examine the impact of critical mass on college retention and persistence rates.

Recent research into the factors affecting college retention and persistence rates often cite Tinto's 1975 interactionalist argument that both academic integration and social integration matter in determining college retention rates. Tinto's widely cited claim is that drop-outs result from "insufficient interactions with others in the college and insufficient congruency with the prevailing value patterns of the college collectivity" (1975, 92). While this argument continues to be widely accepted, other researchers have built off of Tinto's work to study other factors – both individual and institutional – that impact college retention and persistence rates.

Reason (2003) cites Astin, Korn, & Green among the many studies that have shown variables such as high school grade point average (GPA) and college admissions test scores

(SAT/ACT) as consistent predictors of retention (Astin, Korn, & Green 1987; Reason 2003). Yet, we know from previously cited studies that teacher demographics and diversity have clear impacts on student achievement and test scores, which highlight the need to further examine this critical mass theory.

In a similar vein, black male student assignment to black teachers in at least one grade between the 3rd and 5th grade has been shown to reduce the chances of high school drop outs in these students as well as increase the likelihood of college attendance (Gerchenson et al. 2017). Specifically, the probability of dropping-out for these students is lowered by 39% and the expressed intent to attend college increased by 29% among the black male students in the study (2-3; 35). Such findings open up other avenues to study the long-run impact of teacher diversity on educational outcomes.

The purpose of this research paper is to provide a previously unmade connection between these two broad and important fields. Understanding that non-white teachers may play an outsize role in impacting academic outcomes for students, but especially non-white students, we will examine whether this impact extends to college retention rates. We take on a previously constructed model hypothesizing the nonlinear relationship between "representative bureaucracy" and "student outcomes" using critical mass theory (Meier, Wrinkle, Polinard 1999, 1032-1033); and will specify it to predict college retention and persistence rates for public school graduates in Chicago to answer the question of whether a critical mass of non-white teachers at a school be used to predict an observable difference of that school's college-going graduates to remain enrolled after their first year.

References

Astin, A., Korn, W., & Green, K. (1987, Winter). Retaining and satisfying students. Educational Record, 36-42.

Boser, Ulrich. "Teacher Diversity Revisited." Center for American Progress, 4 May 2014, www.americanprogress.org/issues/race/reports/2014/05/04/88962/teacher-diversity-revisited/.

Cole, Beverly P. "The Black Educator: An Endangered Species." The Journal of Negro Education, vol. 55, no. 3, 1986, pp. 326–334. JSTOR, JSTOR, www.jstor.org/stable/2295103.

Dee, Thomas S. "A Teacher like Me: Does Race, Ethnicity, or Gender Matter?" The American Economic Review, vol. 95, no. 2, 2005, pp. 158–165. JSTOR, JSTOR, www.jstor.org/stable/4132809.

Fraga, Luis Ricardo, Kenneth J. Meier, and Robert E. England, "Hispanic Americans and Educational Policy: Limits to Equal Access," The Journal of Politics 48, no. 4 (Nov., 1986): 850-876.

Gershenson, Seth, Cassandra M. D. Hart, Constance A. Lindsay, and Nicholas W. Papageorge. 2017. The Long-Run Impacts of Same-Race Teachers. Bonn, Germany: IZA Institute of Labor Economics.

Grissom, Jason A., and Christopher Redding. "Discretion and Disproportionality." AERA Open, vol. 2, no. 1, 2016, pp. 1–25., doi:10.1177/2332858415622175.

Grissom, Jason & Kern, Emily & Rodriguez, Luis. (2015). The "Representative Bureaucracy" in Education: Educator Workforce Diversity, Policy Outputs, and Outcomes for Disadvantaged Students. Educational Researcher. 44. 185-192. 10.3102/0013189X15580102.

Grissom, Jason, Luis A. Rodriguez, and Emily C. Kern, "Teacher and Principal Diversity and the Representation of Students of Color in Gifted Programs: Evidence from National Data," The Elementary School Journal 117, no. 3 (March 2017): 396-422.

Kanter, R. M. Men and Women of the Corporation. NY: Basic Books, 1993.

Kingsley, J. Donald. "Representative bureaucracy." Representative Bureaucracy: Classic Readings and Continuing Controversies (1944): 12-18.

Meier, Kenneth J., and Joseph Stewart. "The Impact of Representative Bureaucracies: Educational Systems and Public Policies." The American Review of Public Administration, vol. 22, no. 3, 1992, pp. 157–171., doi:10.1177/027507409202200301.

Meier, Kenneth J., et al. "Representative Bureaucracy and Distributional Equity: Addressing the Hard Question." The Journal of Politics, vol. 61, no. 4, 1999, pp. 1025–1039. JSTOR, JSTOR, www.jstor.org/stable/2647552.

Nicholson-Crotty, Jill, Jason A. Grissom, and Sean Nicholson-Crotty, "Bureaucratic Representation, Distributional Equity, and Democratic Values in the Administration of Public Programs," The Journal of Politics 73, no. 2 (April 2011): 582-596.

Papageorge, N. W., Gershenson, S., & Kang, K. (2016). Teacher expectations matter. IZA Discussion Paper No. 10165.

Pitts, David W. "Representative Bureaucracy, Ethnicity, and Public Schools." Administration & Society, vol. 39, no. 4, 2007, pp. 497–526., doi:10.1177/0095399707303129.

Reason, Robert D. "Student Variables That Predict Retention: Recent Research and New Developments." Journal of Student Affairs Research and Practice, vol. 40, no. 4, Mar. 2003, doi:10.2202/1949-6605.1286.

Tinto, Vincent. "Dropout from Higher Education: A Theoretical Synthesis of Recent Research." Review of Educational Research, vol. 45, no. 1, 1975, p. 89., doi:10.2307/1170024.