

# More Choices, More Problems? Ranked Choice Voting Errors in New York City

American Politics Research  
2023, Vol. 0(0) 1–14  
© The Author(s) 2023  
Article reuse guidelines:  
[sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)  
DOI: 10.1177/1532673X231220640  
[journals.sagepub.com/home/apr](https://journals.sagepub.com/home/apr)



Lindsey Cormack<sup>1</sup> 

## Abstract

Examining the impacts of ranked choice voting (RCV) on voter efficacy is important as more areas consider adoption. The greater number of choices provided by longer RCV ballots may introduce opportunities for voters to misunderstand the ballot, make errant marks, or accidentally mark two or more candidates for one ranking, resulting in voidable ballots due to “overvoting.” Using ballot data from the 2013 general election, the 2017, and 2021 New York City democratic mayoral primaries, this paper asks whether voidable overvote ballots are more concentrated in constituencies with lower levels of educational attainment, average household incomes, and differing racial make-ups, and if this relationship is more pronounced under RCV than traditional elections. In the first RCV election in 2021, voters in locations with lower levels of educational attainment and median household incomes had higher shares of overvote voidable ballots than those in locations with higher educational attainment and incomes.

## Keywords

ranked choice voting, electoral systems, voter efficacy

## Introduction

Most elections in the US operate under one-time, single-winner plurality rules. This means that the candidate who receives the highest number of votes wins the seat, without requiring the winner to earn a majority (Santucci, 2018). However, Ranked Choice Voting (RCV) is an increasingly adopted electoral reform in US cities and states. In 2021, New York City - home to the the largest municipal government of the United States - agreed to hold municipal partisan primaries using RCV (Fortin, 2020).<sup>1</sup> Like traditional elections RCV elections in the US are also generally single-winner contests<sup>2</sup> that do not require a majority threshold to select a winner. RCV elections have multiple tabulation stages, where ranked votes transfer from the least selected candidates to others until the final top two candidates emerge, and the winner is determined as the highest vote getter. In this paper I assess one of the unintended consequences of implementing RCV for voters, the possibility that their ballots are voided due to marking errors.

In recent years, scholars have shown a greater interest in assessing the potential promises and pitfalls of the RCV system. More outlets are dedicating issues to theoretical, experimental, and empirical analyses of how RCV works in the US context (Tolbert and Kuznetsova, 2021) as well as the potential for RCV to influence voters’ attitudes towards democracy in general (Gutiérrez et al., 2022). As more states and municipalities consider implementing RCV, it is

important to assess how the system performs empirically across a range of questions. In this paper, I explore the possibility that the additional choices allowed in RCV may unintentionally present downsides for voters. Specifically, I find that for certain voters, this change may lead to reduced electoral efficacy due to errors that result in voided ballots.

## Voters and Voting Decisions

Voters’ levels of political knowledge and interest are often related to demographic characteristics and overall voting performance (Carpini & Keeter, 1996; Brady et al., 1995; Brehm and Rahn, 1997). Generally, better educated and wealthier voters tend to be more informed about political matters and elections on average (Lind and Rohner, 2017). When it comes to making ballot errors, even on non-RCV ballots, less educated individuals tend to make more errors compared to those who are more educated (Hermson et al., 2012). These differences in knowledge and education may

---

<sup>1</sup>Stevens Institute of Technology, Hoboken, NJ, USA

### Corresponding Author:

Lindsey Cormack, College of Arts and Letters, Stevens Institute of Technology, 1 Castle Point on Hudson, Morton 318, Hoboken, NJ 07030, USA.

Email: [lindsey.cormack@gmail.com](mailto:lindsey.cormack@gmail.com)

translate into ballot errors, especially in low-information, local election contexts such as the NYC closed-party municipal primaries.

In its most basic sense, RCV ballot design is more complex than standard plurality voting. RCV ballots have more columns and more choices for voters. Research has shown that longer ballots, in general, result in more errors during marking and scanning (Bernardo et al., 2022). Additionally, voters must be aware of more candidates and understand how to order their preferences to participate correctly. In RCV elections, voters can rank more than one candidate in order of preference. In NYC, voters can rank up to five candidates, although they can choose fewer.

The increased number of choices and decisions faced by voters in RCV elections, compared to single-selection elections, increases the cognitive task associated with voting. Instead of selecting just one candidate, voters are asked to select multiple candidates and indicate their order of preference. This added complexity can be burdensome for voters (Lau and Redlawsk, 2006). Furthermore, if voters strategize their preferences, they may consider how others in the electorate will vote and adjust their internal candidate preferences to “game” the system by placing candidates in different ranking spots to increase the likelihood of candidates progressing to successive rounds or others being eliminated in earlier rounds (Brams and Fishburn, 2007).

Whether strategic calculations come into play for individual voters or not, the fact remains that a ballot asking for up to five candidate rankings is more complex than a ballot that asks for only one. In assessing the increased difficulty of RCV ballots, there are two types of “errors” or unintended uses of the ballot. The first is *under-voting*, where a voter does not fully express their preferences by ranking fewer than five candidates. Under-voting may be intentional if a voter has evaluated all candidates and decided to support fewer than five or is uncertain about the remaining candidates. Under-voting may also be accidental if a voter is unaware of some candidates and believes there is no reasonable way to rank them or if a voter simply does not understand the options allowed by ranked-choice voting. When voters under-vote, their ballots are more likely to be exhausted or eliminated in the final round to determine the winner (Burnett and Kogan, 2015).

The second type of ballot error is *over-voting*, where a voter either intentionally (due to a misunderstanding of the RCV rules) or accidentally selects a candidate or multiple candidates for more than one ranking.<sup>3</sup> In NYC, as is the standard elsewhere, if a voter selects the same candidate as their first, second, third, fourth, and fifth choice, that ballot is counted only once with the candidate used as the first choice and then never transferred in successive rounds if the candidate is eliminated. However, if a voter makes an over-vote error by ranking one candidate for multiple positions and ranking another candidate in any other position on the ballot (whether intentionally or accidentally), the vote for that race is voided, and the ballot is discarded for that race in NYC. This type of ballot spoiling through over-vote errors is the focus of this paper.

As a primary expectation, I hypothesize that the rate of ballot voidable over-voting will increase after the adoption of RCV in NYC primary elections (H1). However, regardless of the overall levels of ballot voidable over-votes, I do not hypothesize that voter errors in RCV elections will be distributed equally. Instead, I expect that different voting populations in NYC will be more or less prone to casting ballot voiding overvotes.

Undervotes and overvotes are different in that overvotes entirely mute a voter’s voice from an election, while undervotes simply turn down the volume. If rates of overvoting are evenly distributed among the electorate or occur randomly, they would still be undesirable. However, there would be fewer concerns regarding equity or political fairness. If ballot voiding through overvoting occurs more frequently in certain groups concentrated in specific geographic locations, efforts should be made to identify these patterns and understand the underlying reasons to work towards political fairness. In the case of NYC, ballot data is released with sufficient granularity as individual voter Cast Vote Records (CVRs), allowing us to determine where overvoting occurs and assess any potential population patterns associated with overvoting.

## Prior Literature on Ranked Choice Voting and Ballot Errors

In previous studies of RCV contexts outside of NYC, voters generally perceive RCV election instructions as more challenging to understand than standard plurality voting. Older voters face the greatest difficulties, but many voters report understanding the system with sufficient explanation (Donovan et al., 2019). Recognizing that interacting with a more complex ballot poses a greater challenge for some voters, scholars have sought to assess how different types of voters engage with RCV ballots and elections, even if their basic understanding of the process is similar. Although RCV usage is still limited, there are lessons from other locations that can inform expectations for the NYC context.

During the first 3 years of RCV elections in San Francisco, disqualifying overvotes were concentrated in neighborhoods with higher numbers of African American and foreign-born residents. However, over time, as voters became more experienced with the more involved RCV ballots, the occurrence of overvotes decreased (Neely and Cook, 2008). A more comprehensive analysis of elections in California revealed that voided ballots were still, “more common in precincts where more African-American citizens reside and are often observed at higher rates in precincts that contain more Latino, elderly, foreign-born, and less wealthy residents.” (Neely and McDaniel, 2015).<sup>4</sup> Similar racially and ethnically divided results were found in Los Angeles County, with communities that had more foreign-born and Spanish-speaking residents exhibiting higher rates of disqualifying overvoting (Sinclair and Alvarez, 2004).

In the San Francisco Mayoral races, [Mcdaniel \(2016\)](#) found that increasing the complexity of an election with RCV discouraged voter turnout, particularly in places with older and less affluent residents. However, the results regarding racial differences were mixed. In earlier elections, voters from higher-income and higher-education areas in San Francisco were more likely to be aware of RCV before going to the polls, while Black and Latine voters were more likely to express difficulties in understanding RCV compared to white voters ([Neely et al., 2005](#)).

Although the electorates of the California cities studied differ from that of NYC, some similarities can be drawn. Like certain parts of California with RCV, NYC has a highly diverse and geographically segregated population. Previous studies that found higher rates of overvoting and lower rates of prior RCV awareness in locations with fewer non-white voters, lower wealth, and lower average educational attainment may suggest that similar patterns could occur in NYC. Areas with lower average educational attainment and lower household incomes are more likely to have working adults with limited time to invest in learning about RCV and politics in general. Voter turnout in these areas in NYC tends to be lower compared to wealthier areas (see [Figure 1](#)) and candidates tend to spend less time in these areas as they are less fruitful in generating campaign donations and large numbers of votes. Although distinct, there is a positive and high correlation between the share of voters with a 4-year college degree and median household income, with a rho of .85 in 2019, and .84 in 2016 and 2012.

### Expectations

Debate exists regarding the causal mechanisms, but it has long been observed that voters with higher levels of education and income are generally more likely to turn out ([Mayer, 2011](#), [Franko et al., 2016](#)), complete ballots ([Lamb and Perry, 2020](#)), and be more politically engaged ([Sunshine Hillygus, 2005](#)). Differences in education and income also influence familiarity with voting and changing electoral systems ([Burden, 2009](#); [Sondheimer et al., 2010](#); [Tenn, 2007](#)), which

could contribute to a higher likelihood of ballot voiding errors among voters in lower education and lower income areas.

Educational differences are also highly geographically divided. In a deeper look at locations known to be where elites live and politicians spend the most time in – over 60% of the over 25 population has a bachelor’s degree, while other areas of NYC have populations with 18–34% of those over 25 with such a degree ([Rakich, 2021](#)).

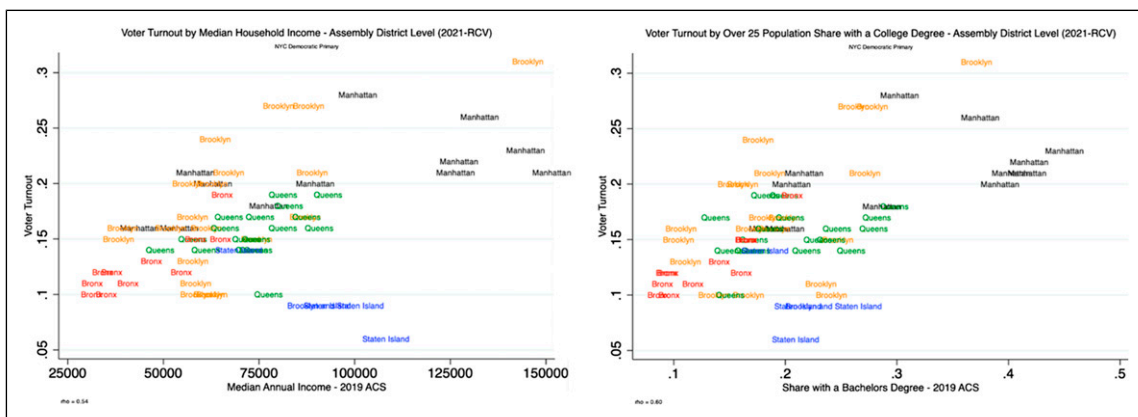
Lower-income areas in NYC are often overlooked during campaigns, leading to reduced overall awareness about elections ([Velasquez et al., 2021](#)). Additionally, language barriers tend to be concentrated in NYC assembly districts with lower proportions of white and poorer residents ([Cartegen, 2008](#)), which may contribute to a misunderstanding of ballot instructions and unintentional overvoting.

Furthermore, voting locations in poorer and more minority-dense areas tend to have lower voting precinct quality ([Barreto et al., 2009](#); [McClendon et al., 2019](#)). In such precincts, the in-person instruction level on the day of voting may be less helpful when navigating a new system such as the transition to RCV. Based on this previous research, I propose the following additional hypotheses:

- H2:** Ballot voidable overvoting will occur at higher rates in assembly districts with a lower proportion of adults (25+) holding college degrees.
- H3:** Ballot voidable overvoting will occur at higher rates in assembly districts with lower average household incomes.
- H4:** Ballot voidable overvoting will occur at higher rates in assembly districts with a lower proportion of white adults.

### The First New York City Experience with RCV

In NYC, the Board of Elections (BOE) utilized mailers and public infrastructure, such as bus and subway stops, to advertise the new system. Registered voters received explanatory mailers, which included images like those shown in [Figures 2 and 3](#).



**Figure 1.** Voter turnout by median household income & population share with a college degree at the assembly district level in 2021 (RCV).

The NYC Campaign Finance Board and City Board of Elections also provided instructions on what not to do, which were produced and disseminated, as shown in [Figure 3](#).

Although the BOE and the NYC Campaign Finance Board made efforts to educate voters about RCV, the majority of effective person-to-person outreach was left to individual campaigns. Candidates and campaign staff were responsible for informing voters about the new system, but their willingness and abilities to discuss RCV varied. Candidates from districts with lower levels of English speakers expressed concerns about the lack of translated materials and equivalent terms for “ranked choice voting” in other languages during online training sessions.<sup>5</sup>

While some research suggests that candidates in RCV elections tend to have more positive campaign messages ([Donovan et al., 2016](#); [Kropf, 2021](#); [Sarah & Douglas, 2017](#)), in NYC candidates continued to campaign using the previous approach of simply asking for voters’ votes, without explaining the intricacies of RCV. In televised Mayoral Debates, most candidates were unwilling to provide instructions on how voters should rank candidates other than themselves, relying instead on traditional appeal tactics to ask for support. Andrew Yang came out asking voters to rank Kathryn Garcia second, though Garcia issued a series of statements indicating that she did not coordinate with his campaign and said she wanted Yang to stop instructing voters to do that ([Lach, 2021](#)), though she did go on to do a campaign event together 3 days before the election ([Fitzsimmons & Mays, 2021](#)). [Table 1](#) presents the distribution of references to ranked choice voting in the email campaign messages sent by each leading mayoral candidate from May 28th to Election Day on June 22nd.

Importantly, in none of these communications did candidates offer longer explanations of how the RCV system worked or how to use the ranked ballots, but instead sent messages of,

“We need an all-hands-on-deck effort in these last few days to make sure that every supporter of Eric’s casts their ballot and ranks Eric #1”

“And in a ranked-choice simulation, Kathryn narrowly edges out Eric Adams 52%–48% in the final round.”

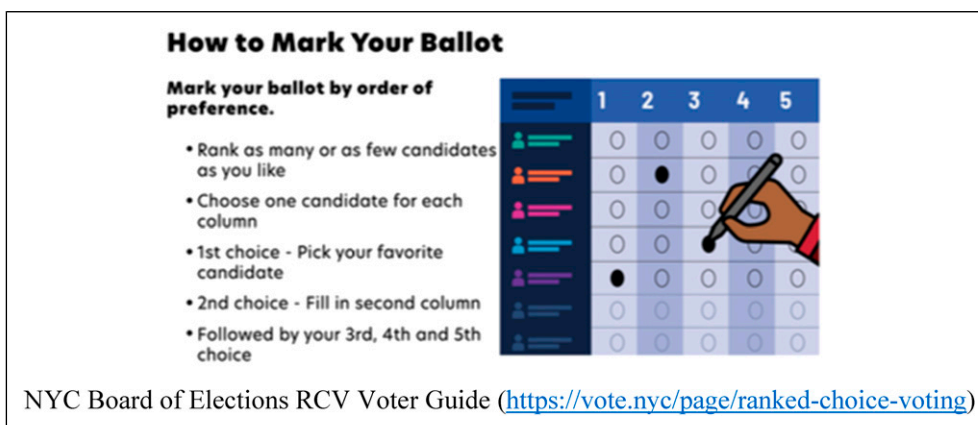
“Right now, every contribution, no matter the size, will go to ensuring we can get Ray’s message to more New Yorkers [sic] so they know to rank Ray first for the greatest, most inclusive comeback in our history.”

“Join me and countless others this election by making your plan to rank Andrew #1 on your ballot before or on June 22nd.”

Voters in NYC headed to the ballot box on primary day to experience a new voting system, with differing levels of time and resources available for political engagement. Though some survey research indicates that voters of all races and ethnicities claimed to understand what RCV was ([Donovan et al., 2022](#)), like findings in other jurisdictions that adopted RCV, there are indications that voters may have varying degrees of success in using the new system, particularly during their initial encounter. An analysis of exit polls on the day revealed that wealthier, more educated, and white voters were more inclined to rank multiple candidates – which might be indicative of more familiarity with the system or candidates ([Wendland and Carman, 2023](#)). Bringing to bear the actual voting data on how the first time with RCV, I now describe how I test the data I use to test occurrences of ballot voiding over-votes and the relationship to assembly district voter characteristics.

## Data and Methods

To test hypotheses 1-4, I utilize voting data from the 2021 and 2017 Democratic primary elections and the 2013 general election for the mayoral race in NYC. The objective is to examine how voting errors and voided ballots differ between the RCV system and the previous traditional election style. The term “ballot voidable errors” is used to describe the dependent variable, which refers to ballots with over-voting errors. This terminology is chosen for two reasons. Firstly,



**Figure 2.** NYC board of elections RCV voter guide.



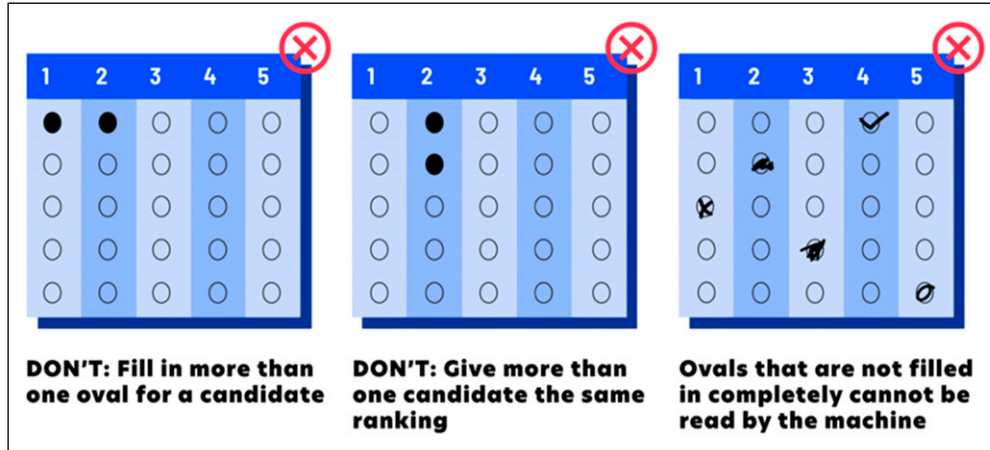


Figure 3. NYC board of elections RCV voter guide.

Table 1. Mayoral Campaign Emails Mentioning RCV.

Candidate	Share of email campaign communications mentioning RCV
Eric L. Adams	15%
Kathryn A. Garcia	10%
Maya D. Wiley	-
Andrew Yang	6%
Raymond J. McGuire	4%
Scott M. Stringer	0%
Shaun Donovan	0%

<sup>a</sup>Campaign emails for Maya D. Wiley were not captured. After a successful addition to the campaign database no further communications were sent – in error.

ballots with over-votes in one race are still valid for other races without errors, indicating that only specific portions of the ballot are voided. Secondly, there are discrepancies in how advocates, candidates, and election officials define and communicate what constitutes a ballot voidable over-vote. In-person voting in NYC involves optical character scanning, which alerts voters to errors and allows them to request a new ballot or proceed with scanning. For mail-in ballots with errors, there is a curing period, and the final vote counts include all cast and cured ballots as long as at least one race has a valid vote per voter. When analyzing ballot voidable errors, I adopt the most inclusive interpretation in favor of the RCV system, meaning that casting a ballot multiple times for the same candidate is not considered a ballot voidable over-vote.

The outcome data consist of rates of ballots cast with voidable over-voting across assembly districts (ADs) in the 2013 general election, as well as the 2017 and 2021 Democratic Mayoral Primaries in NYC. For the 2013 election, AD-level ballot voiding data are available only for the general election. These data are obtained from the NYC BOE, which produces and maintains them. The focus is on the mayoral primary since it is the highest-profile election during the

municipal primary and general cycles, attracting significant media attention and voter turnout.

The voting data are released at the election district (ED) and AD levels, while explanatory variables are generally provided at the AD level. Therefore, the AD is the unit of analysis. An assembly district (AD) refers to a division of the city for the lower chamber, the New York State Assembly, with approximately 130,000 residents in each district ([The Center for Urban Research, 2012](#)). NYC is comprised of 65 ADs across the five boroughs of Brooklyn, the Bronx, Manhattan, Queens, and Staten Island.

In 2013 and 2017 (pre-RCV years) ballot voiding is determined by looking at two AD-wide totals: The “total votes” cast and the votes “unrecorded” which means those that were cast, but for whatever reason there was an error, and these were voided and not a part of the public counting total. In 2021, as a part of the RCV adoption process, the Board of Elections was made to release a “cast vote record” (CVR) for all the elections conducted with RCV. CVRs include votes cast by voter rather than the aggregate reporting style used in previous years. This means that we have a better individual sense of what ballots were voided, but that the aggregate measure must be summed. In 2021 a voter had to cast at least

one non-voidable vote on a ballot in at least one of the RCV elections to make it into the CVR at all. When comparing ballots with voidable over votes in the 2021 RCV election to the 2017 and 2013 elections a few details must be kept in mind. The CVR release of the 2021 records the “over vote” designation on the ballots, in earlier years no such reason is marked as to why ballots were voided – though under voting would not be a reason a vote was “unrecorded” in the 2017 and 2013 plurality election, it would be considered not cast.

I compare the totals of voidable ballots in 2013, 2017, and 2021 at the AD level, along with AD demographic measures reported in 2012, 2016, and 2019, respectively. The AD demographic data are obtained from the US Census.<sup>6</sup> Despite its small geographical size, NYC exhibits significant disparities in terms of wealth, education, and race across its neighborhoods and assembly districts. In 2019, the AD with the lowest median annual family income was AD 84 in the Bronx, with \$26,947, while AD 73 on the Upper East Side had the highest median annual family income at \$144,888. AD 66, covering parts of Manhattan, had the highest proportion of college graduates, with 44% holding at least a bachelor’s degree, whereas AD 86 in the Bronx had the lowest share of college graduates at 8.8%. Racial distributions also vary, with AD 62 in Staten Island having the highest proportion of white residents at 92%, while AD 58 in Brooklyn has the lowest proportion of white residents at 4%.

Studies on over-voting rely on some level of aggregation due to the nature of released voting records. The typical approach is to use the smallest geographic level that provides information on ballot usage and reliable demographic data. However, this strategy carries the risk of ecological inference errors because the unit of analysis is larger than the unit of action-individual voters (Freedman, 1999). A finding at the aggregate level showing more over-votes in areas with lower average incomes does not imply that individuals with lower incomes are solely responsible for over-voting, or that only individuals with low incomes engage in over-voting. It is even possible that over-voting errors in areas with lower average incomes originated from higher-income individuals, indicating a different issue.

However, these ecological inference errors are less concerning when there is no theoretical reason to believe that a finding is incorrectly rooted. There are valid reasons to anticipate that over-voting errors would occur more frequently and be observable at the aggregate level of ADs. In NYC, areas with lower average incomes, lower education rates, and fewer white residents tend to exhibit lower political engagement and utilization of available rankings in the 2021 RCV election (Anuta, 2021). That is, other ballot indicators beyond over-voting also signal overall usage patterns that differ based on income, education, and sometimes race or English familiarity.

Racial divisions within ADs may not best be characterized by the proportion of white residents, though it is the most

straightforward measure available. New York City’s boroughs encompass diverse population centers of various minority groups. By considering the share of white and non-white voters, the analysis aims to capture a broader picture that goes beyond individual racial or ethnic groups. While this approach may obscure specific language and group dynamics, hopefully these analyses and results lay the groundwork for future research to delve into more specific pathways across different groups of voters.

## Analyses and Results

The initial analyses involve simple comparative correlations. Subsequently, the results of OLS regressions are presented. Noting that the small sample size and the high correlation among independent variables somewhat complicates the assessment of the question at hand. For each year, the relationship between the total number of ballot voidable errors in an AD and the most recent measures of (1) the share of residents over 25 with a college degree (indicating educational attainment in the AD), (2) median household income (reflecting AD earning power)<sup>7</sup>, and (3) the share of white resident (as a measure of the racial composition of the AD) are examined.

Table 2 provides a descriptive overview, organized by borough, of the main variables of interest derived from the 2019 American Community Survey of the Census. A significant portion of the variance in most measures stems from comparisons between boroughs rather than variations within boroughs.

Recall that the initial focus is on the 2021 mayoral election, followed by an examination of the 2017 and 2013 elections to assess the rates of ballot voiding due to overvotes and its correlation with education, income, and race.

Hypothesis 1 proposed that there would be a higher number of discarded ballots overall in 2021 compared to 2017 and 2013. However, the results in NYC do not support this hypothesis. In 2021, the average percentage of discarded ballots by AD was 1.2%, ranging from .4% to 4.1%. In 2017, the average was 1.8%, ranging from .3% to 5.1%, and in 2013, the average was 1.4% with a range of .5%–4.4%. If anything, overall ballot voiding was slightly lower in 2021 compared to previous elections. While the results do not provide support for H1, analyzing the data at the aggregate level may mask important variation discussed in H2-H4 as these findings do not provide insights into the distribution of ballot voidable overvotes.

To visually represent the relationships between ballot voidable overvoting and education by AD, I present the correlation between these measures for each year. Figure 4 illustrates the results from the 2021 Democratic Primary for Mayor.

For each of the 65 ADs, the borough is indicated by name and a distinct color. There is a strong correlation

of  $-.73$  between the share of voidable overvoting ballots and the proportion of the population with a bachelor's degree or higher. In areas with a higher percentage of college-educated residents, the rate of voided ballots is lower compared to areas with a lower share of individuals with a college education. This relationship is quite evident. Although there is some overlap in ADs where the share of college-educated residents ranges from 18% to 25%, there is a clear overall pattern indicating the association between the share of college-educated residents and voidable overvoting. This effect is not solely driven by differences between boroughs. Within every borough except Staten Island (which has a smaller number of ADs and voters), there are negative and significant correlations between the share of voters with a bachelor's degree and the percentage of ballots with voidable overvoting. Specifically, the correlation within the Bronx is  $-.82$ , Brooklyn is  $-.65$ , Queens is  $-.73$ , and Manhattan is  $-.87$ .

However, it is worth considering that voters in areas with lower overall education levels may also make more errors in standard elections. To examine the historical patterns of ballot voiding in NYC, I employ the same correlation approach for the 2017 primary election and the 2013 general election, as depicted in Figures 5 and 6, respectively.

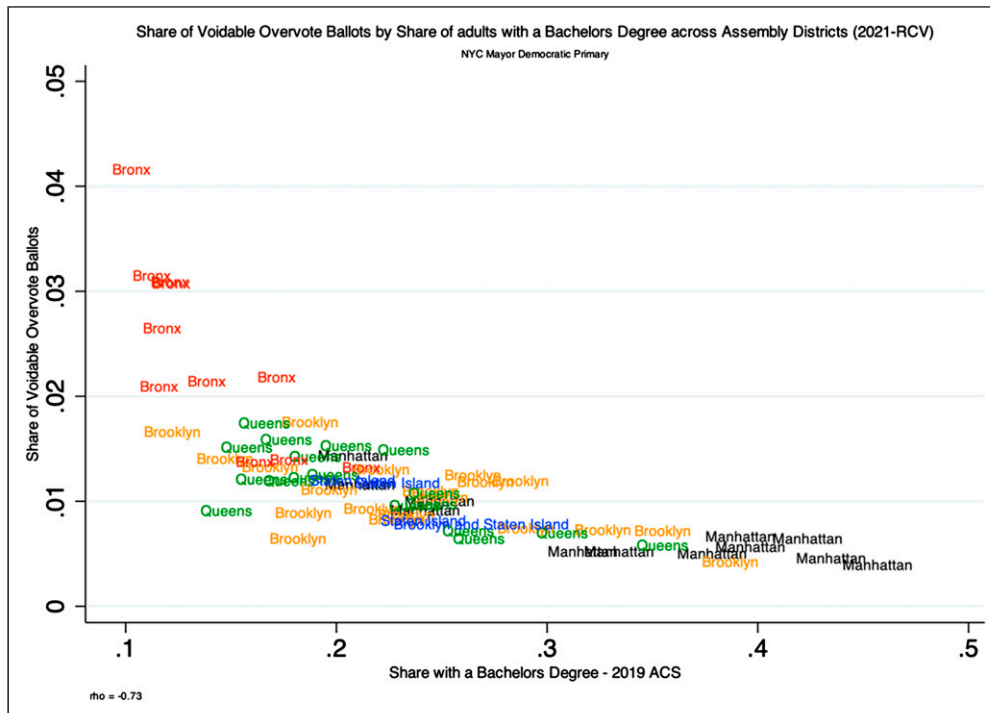
Applying the same analysis strategy to the 2017 and 2013 elections in NYC, the correlations do not raise the same fairness concerns. Figure 5 illustrates that in the most recent non-RCV election, ballot errors exhibit a weak correlation with education levels ( $\rho = .18$ ). There is a scattered distribution of errors across different education levels and within boroughs, indicating no clear relationship. In the 2013 general election, which had fewer ballot errors overall, the correlation with education levels in the assembly district is also insignificant.

Similarly, when examining median annual income using the same approach (Figures 7–9), the pattern is comparable.

**Table 2.** Borough Wide Statistics 2019.

	# Of ADs	Median household income	Share of 25+ with a B.A.	White %	Black %	Asian %	Hispanic/Latine %
Bronx	11	41,116	13%	22	35	4	56
Brooklyn	20.5	63,338	22%	45	31	12	19
Manhattan	12	90,899	32%	57	14	12	25
Queens	18	69,036	20%	38	18	25	28
Staten Island	3.5	82,140	21%	74	10	1	19

Brooklyn and Staten Island have one Assembly District split between the boroughs.



**Figure 4.** Share of voidable overvote ballots by share of adults with a bachelors degree across assembly districts (2021-RCV).

Voters in areas with higher median household incomes tend to have higher percentages of valid ballots, whereas lower income areas have higher proportions of voidable ballots resulting from overvoting in the 2021 RCV election. However, this trend is not observed in the standard elections of previous years. Furthermore, this pattern holds true within boroughs.

The correlation coefficient between the share of college-educated residents and the rate of voidable overvoting in the RCV election is statistically significant at the .05 level, with a coefficient of  $-.67$ . However, in the 2017 Democratic primary, there is no detectable relationship ( $\rho = .02$ ), and in 2013, the correlation is also insignificant ( $\rho = .08$ ), indicating no significant correlation between these two measures in those elections.

When examining the relationship between race and overvoting, a different presentation strategy is employed. The correlations between the share of white residents, Black residents, Asian residents, Hispanic/Latino residents, and overvoting are calculated for each assembly district. These correlations are presented in Table 3.

These results indicate that in the 2021 election, assembly districts with higher proportions of white and Asian residents tended to have fewer voidable overvotes, while districts with larger populations of Black and Hispanic/Latino residents tended to have more voidable overvotes. However, when examining the results from 2017 and 2013, the relationships become more varied. In 2017, areas with more white residents showed no relationship to voting but exhibited a stronger relationship to ballot voiding in 2013. For areas with more

Black voters, there were lower levels of ballot voiding in both 2017 and 2013. In 2017, there were higher levels of ballot voiding in areas with more Asian voters, but no relationship was observed in 2013. Lastly, areas with higher proportions of Hispanic/Latino voters did not show a consistent relationship in the earlier years. It's important to note that these findings are more nuanced due to the dynamic nature of districts and the varying racial compositions within them.

To further assess the comparative impacts of these different factors on ballot voiding overvotes, OLS regression analysis is employed as a final test with results presented in Table 4.<sup>8</sup>

When considering each factor comparatively, it appears that the variables most closely associated with ballot voiding over voting is the share of those with a college education or more, and the median annual income within an assembly district. Although these variables are highly correlated, there is a statistically significant relationship observed in the first regression between education and ballot voiding as well as income and ballot voiding. In the 2017 election, none of the variables appeared to be significantly related to the outcome, indicating less variation explained by these factors compared to 2021. In the 2013 election, the share of median annual income was related to ballot voiding, with higher-income areas experiencing lower levels of voiding, but areas with a higher proportion of white voters tending to have more voiding.

Focusing solely on the 2021 election, I calculate the predicted probabilities of ballot voidable overvoting by comparing districts at the 25th percentile of education

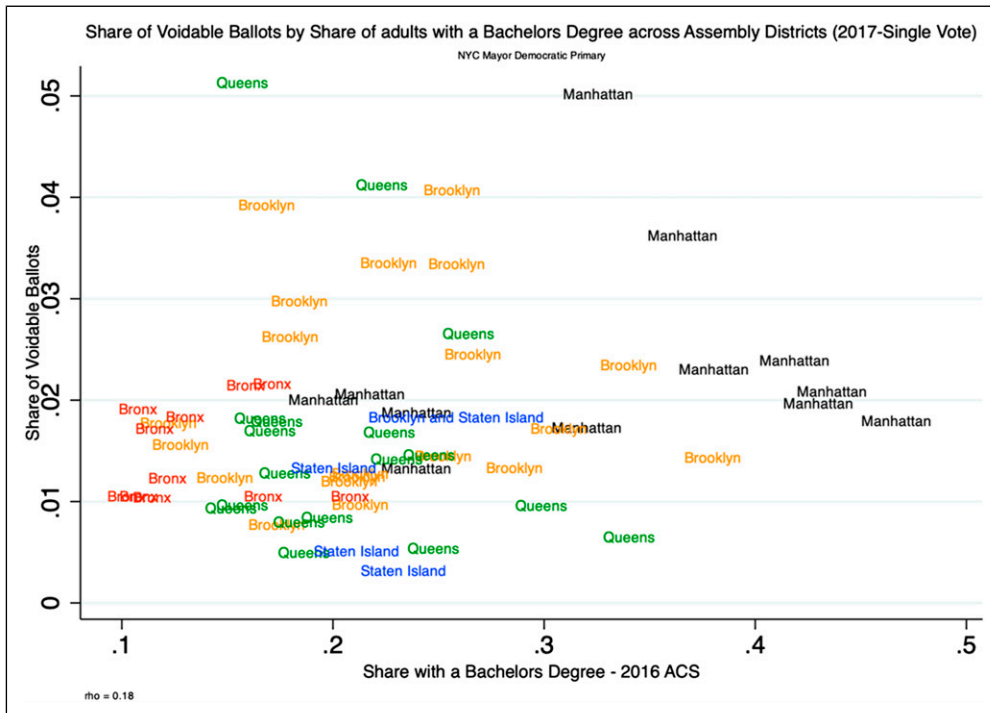


Figure 5. Share of voidable ballots by share of adults with a bachelors degree across assembly districts (2017-single vote).



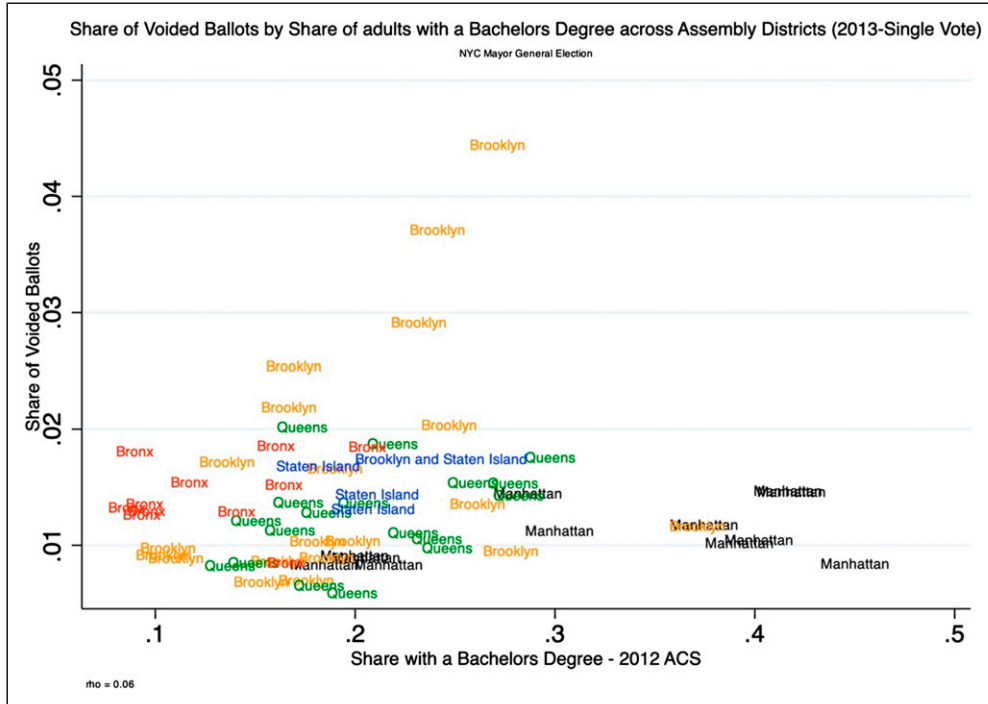


Figure 6. Share of voided ballots by share of adults with a bachelors degree across assembly districts (2013-single vote).

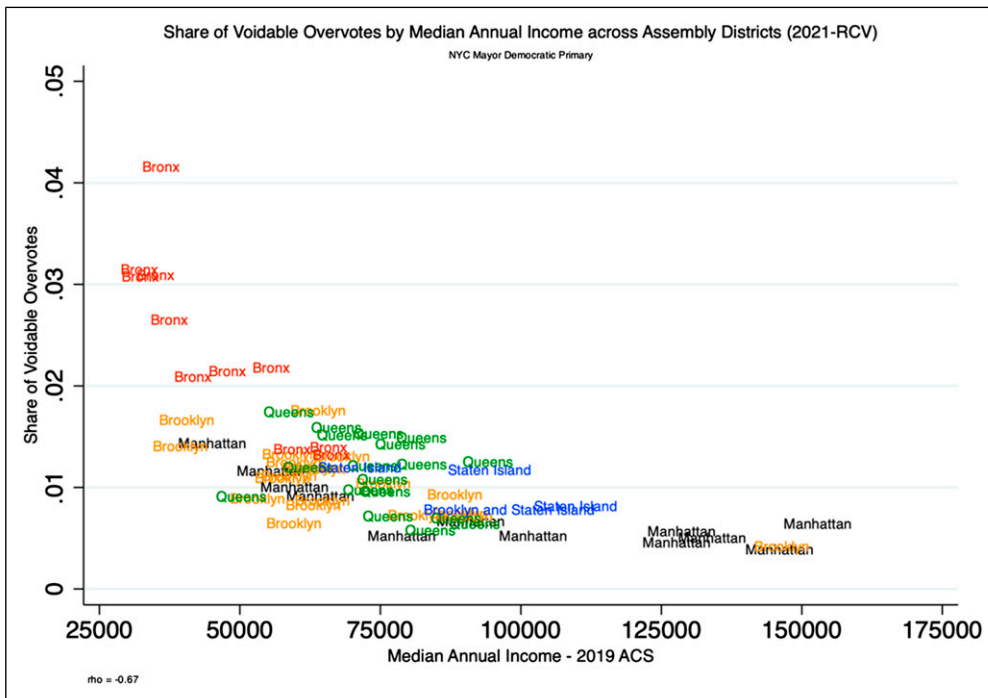


Figure 7. Share of voidable overvotes by median annual income across assembly districts (2021-RCV).

(15.8% of the population over 25 holds a Bachelor’s Degree or higher) to districts at the 75th percentile of education (25% of the population over 25 holds a Bachelor’s Degree or higher), while holding other factors constant. In the

25th percentile, an estimated 1.5% of ballots would be lost to voiding, whereas in the 75th percentile, only .9% would be lost, representing a difference of .6, which accounts for 30% of the overall estimated scale. Although the raw number of

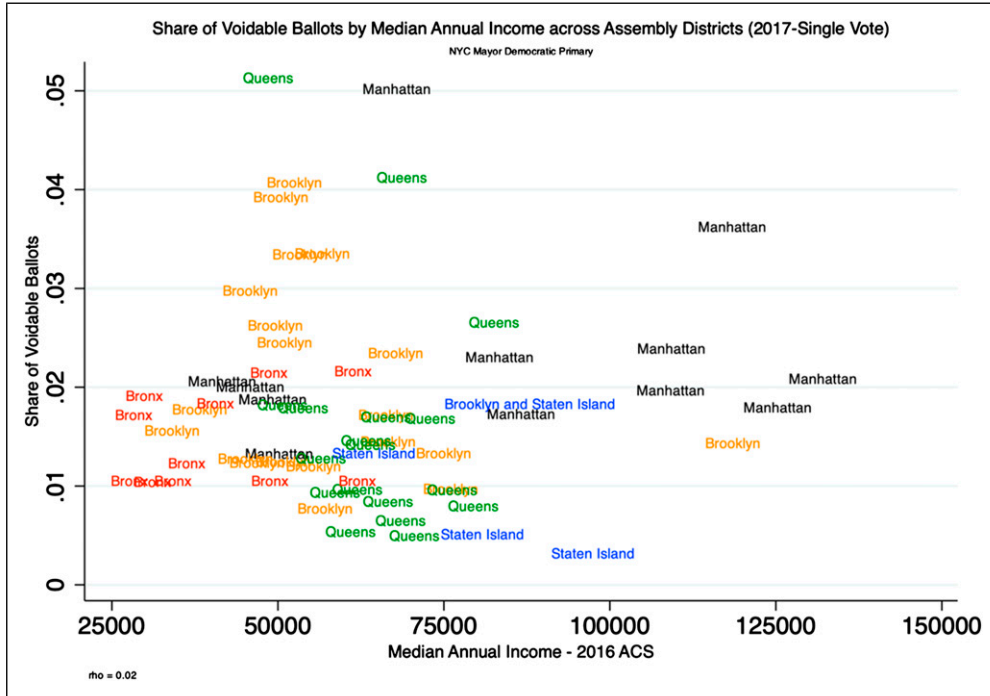


Figure 8. Share of voidable ballots by median annual income across assembly districts (2017-single vote).

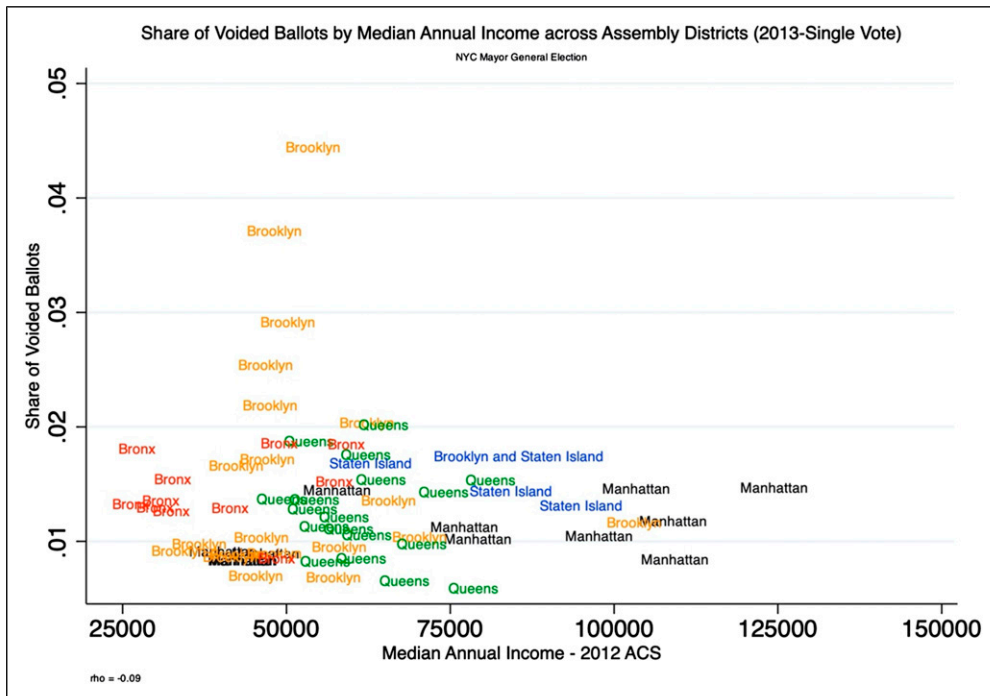


Figure 9. Share of voided ballots by median annual income across assembly districts (2013-single vote).

**Table 3.** Correlation Between Shares of Different Races and Ballot Voiding Across Assembly Districts.

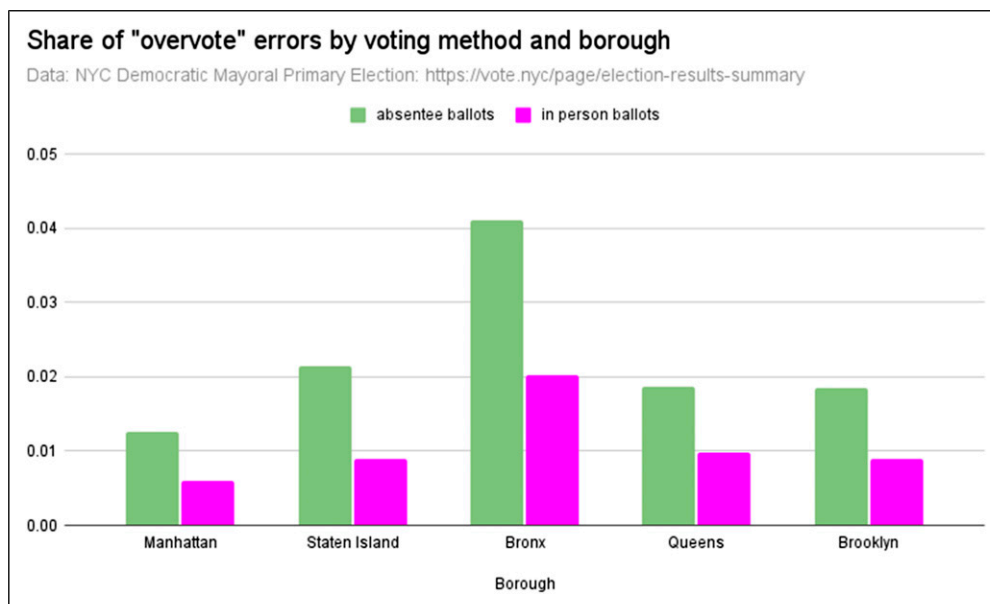
Population Share	2021 Ballot voiding	2017 Ballot voiding	2013 Ballot voiding
White	-.60 <sup>a</sup>	.18	.43 <sup>a</sup>
Black	.36 <sup>a</sup>	-.43 <sup>a</sup>	-.48 <sup>a</sup>
Asian	-.34 <sup>a</sup>	.63 <sup>a</sup>	.11
Hispanic/Latino	.71 <sup>a</sup>	-.17	-.13
Overall ballot voiding	.01	.01	.01

<sup>a</sup>p < .05.

**Table 4.** Shares of Ballot Voiding Overvotes by Education, Income, and Race by Assembly Districts (OLS).

	2021 Ballot voiding	2017 Ballot voiding	2013 Ballot voiding
Share of voters with A Bachelor's degree or higher	-.02 <sup>a</sup> (.01)	.04 (.03)	-.01 (.01)
Median annual income	-.01 <sup>a</sup> (.00)	-.01 (.01)	-.01 <sup>a</sup> (.00)
Share of white population	-.00 (.00)	.02 (.02)	.02 <sup>a</sup> (.00)
Constant	.12 (.03)	.14 <sup>a</sup> (.06)	.11 <sup>a</sup> (.04)
N	65	65	65
R <sup>2</sup>	.61	.22	.41

<sup>a</sup>p < .05.



**Figure 10.** Share of "overvote" errors by voting method and borough.

discarded ballots due to overvoting may seem small, the difference in the distribution of voided ballots based on education levels in the electorate is significant.

### Conclusion and Discussion

In the first use of ranked choice voting in NYC in 2021, areas with a higher percentage of college-educated residents tended to have a lower rate of voided ballots due to overvoting. This

pattern was not evident in the standard elections of 2017 and 2013, where there is a scattered distribution of errors across different education levels. In the 2021 RCV election, areas with higher median incomes generally had fewer voided ballots, while lower-income areas tended to have a higher proportion of voidable ballots. However, this does not consistently hold for the standard elections of 2017 and 2013. The racial make-up of assembly districts in NYC was not found to be independently related to the rate of ballot voiding over votes in 2021, though in

2013 areas with fewer shares of white voters tended to more ballot voiding. Altogether, this study underscores that educational attainment and income levels have a significant impact on the rates of discarded ballots due to overvoting in the 2021 RCV election, but not in previous elections.

Ranked choice voting has gained significant traction as a contemporary electoral reform. Advocacy groups supporting RCV have successfully promoted its adoption in various contexts. Proponents of this reform highlight benefits such as increased voter expression, greater candidate diversity, and more civil campaigns. While these goals are appealing, it is essential to pay attention to the equity concerns associated with RCV. There is a lack of opposition to RCV in the decision-making process at the municipal and state levels, resulting in an abundance of positive advocacy research and limited research on potential negative consequences.

By emphasizing expressiveness in voting, we may inadvertently exacerbate participation inequalities. Communities that already have lower political engagement and receive less attention from politicians could face further marginalization if a higher proportion of votes are voided. The increased number of candidates and the requirement for voters to rank five choices make the voting process slightly more challenging. It demands more attention and accuracy in marking the ballot compared to a standard single-choice election.

While no one accuses advocates of good governance reform of intentionally creating barriers for low-income or low-education populations, evidence suggests that this occurred in the initial implementation of RCV in NYC. Similar findings have been observed in other locations and are likely to persist if the reform is adopted elsewhere without proactive measures to prevent, mitigate, and rectify these issues.

In addition to the complexities of RCV, NYC voters face the challenge of simultaneous elections using both RCV and single choice voting methods. This increases the importance of proper ballot use and attention. Furthermore, RCV is currently limited to party primaries, creating a “whiplash” effect where voters need to be aware of which elections and years feature RCV. NYC also expanded mail-in voting, and [Figure 10](#) shows that a higher share of voidable overvotes occurred among mail-in ballots compared to in-person voting.

The higher occurrence of voidable overvote ballots by mail in the NYC context is not surprising. In-person balloting using optical-scan methods can alert voters to potential uncountable ballots, reducing error rates ([Ansolabehere and Stewart III, 2005](#); [Kimball and Kropf, 2005](#)). Municipalities using different, non-scanned systems are likely to have higher risks of voidable overvoting, highlighting the impact of balloting mechanics on various outcomes ([Bullock and Hood, 2002](#); [Sinclair and Alvarez, 2004](#)).

Efforts can be made to maintain multiple voting options while minimizing the negative impact on voter efficacy disparities. Governments considering RCV can invest extra efforts in educating voters in low-income and lower educational attainment areas on properly filling out a ballot to ensure its

validity. Legislators with a focus on voting equity should allocate targeted funding to address issues related to unfamiliar ballots, especially after adopting balloting reforms like RCV. Election boards should take measures to address incorrectly filled-out mail-in ballots, particularly in the context of a balloting reform such as RCV. Alternatively, legislators interested in reform may explore other approaches like Approval Voting, which allows voters to mark any number of candidates they approve of, eliminating the overvote error present in ordinal systems while still capturing the expressive nature of RCV.

When reforms fall short of delivering on their promises or result in unfair outcomes, voters may contemplate abandoning new election styles. This switching could lead to a heightened sense of distrust in election institutions. Since the year 2000, certain jurisdictions have taken this route, including Henderson in North Carolina, Memphis in Tennessee, Pierce County in Washington, Aspen in Colorado, and temporarily in Burlington, Vermont, as well as on a statewide basis in Maine. A survey of municipal clerks in Maine found that most did not want to continue with RCV ([Anthony et al., 2021](#)). A number of these locales have repealed their RCV systems shortly after their implementation due to various concerns related to fairness - though Maine has since reinstated RCV for some elections and is considering an expansion of RCV for more positions ([Whittle, 2023](#)).

As the demand for pro-democracy reforms continues to grow, it becomes imperative to meticulously assess the advantages and disadvantages of various approaches. If the ultimate objective is to achieve a more representative and functional democracy by encouraging greater voter participation, it's crucial to ensure that existing political inequalities are not worsened by the introduction of new electoral reforms. For jurisdictions adopting new electoral reforms, going in with an open understanding of the challenges faced by certain voters should serve to make rollout efforts more equitable.

### 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) received no financial support for the research, authorship, and/or publication of this article.

### ORCID iD

Lindsey Cormack  <https://orcid.org/0000-0001-8464-1806>

### Notes

1. RCV systems are sometimes known as single-transferable vote (STV) systems because each voter only ever selects one candidate in each round, depending on how others in the electorate cast ballots. RCV is also sometimes known as instant runoff voting (IRV) because unlike traditional runoff elections that

happen on two different days, the “run off” stage of RCV happens instantly after the ordering of candidates is established. For this paper I refer to the balloting system as RCV, as that’s how voters in NYC referred to it.

2. Cambridge, MA is an exception for some elections.
3. For the New York City statute describing over-voting see: <https://govt.westlaw.com/nycrr/Document/14fa94c82cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=sc.Default>
4. Considering another sizable minority population in the California context, areas with greater shares of people of Asian descent have not shown higher rates of over voting.
5. The New York City Campaign Finance Board group, NYCVotes, held a series of “Train the trainer” zoom sessions in early 2021 (<https://nycvotes.nyccfb.info/rcvttt01-20>) in which election workers and advocates who worked with non-English speaking populations voiced concerns about not having consistent translations of the term “Ranked Choice Voting.”
6. 2019 median household income data are from the 2019 American Community Survey (Median Income in The Past 12 Months (In, 2019 Inflation-Adjusted Dollars). 2016 median household income data are from the 2016 American Community Survey, 2012 median household income data are from the 2012 American Community Survey. Assembly district race totals are from the 2012, 2016, 2019 ACS Demographic and Housing Estimates. Assembly district educational attainment totals are from the 2012, 2016, 2019 Educational Attainment for The Population 25 Years and Over.
7. The logarithm of this variable is used in the regression analyses.
8. Noting that most of the variation comes from across boroughs rather than within boroughs I do not include borough fixed effects.

## References

- Ansolabehere, S., & Stewart, C. III. (2005). Residual votes attributable to technology. *The Journal of Politics*, 67(2), 365–389.
- Anthony, J., Fried, A., Glover, R., & Kimball, D. C. (2021). Ranked choice voting in maine from the perspective of local election officials. *Election Law Journal: Rules, Politics, and Policy*, 20(3), 254–271.
- Anuta, J. (2021). Lower-income communities showed less engagement with ranked-choice voting in NYC primary. <https://www.politico.com/states/new-york/city-hall/story/2021/09/08/lower-income-areas-of-nyc-had-a-harder-time-with-ranked-choice-voting-1390719>
- Barreto, M. A., Cohen-Marks, M., & Woods, N. D. (2009). Are all precincts created equal? The prevalence of low-quality precincts in low-income and minority communities. *Political Research Quarterly*, 62(3), 445–458.
- Bernardo, N. D., Pearson-Merkowitz, S., & Macht, G. A. (2022). The effect of ballot characteristics on the likelihood of voting errors. *State Politics and Policy Quarterly*, 22(2), 121–139.
- Brady, H. E., Verba, S., & Lehman, K. S. (1995). Beyond SES: A resource model of political participation. *American Political Science Review*, 89(2), 271–294.
- Brams, S., & Fishburn, P. C. (2007). *Approval voting*. Springer Science & Business Media.
- Brehm, J., & Rahn, W. (1997). Individual-level evidence for the causes and consequences of social capital. *American Journal of Political Science*, 41(3), 999–1023.
- Bullock, C. S., & Hood, M. V. (2002). One person—no vote; one vote; two votes: Voting methods, ballot types, and undervote frequency in the 2000 presidential election. *Social Science Quarterly*, 83(4), 981–993.
- Burden, B. C. (2009). The dynamic effects of education on voter turnout. *Electoral Studies*, 28(4), 540–549.
- Burnett, C. M., & Kogan, V. (2015). Ballot (and voter) “exhaustion” under Instant Runoff Voting: An examination of four ranked-choice elections. *Electoral Studies*, 37, 41–49.
- Carpini, M. X., & Keeter, S. (1996). *What Americans know about politics and why it matters*. Yale University Press.
- Cartegena, J. (2008). Voting rights in New York city: 1992–2006. *Review of Law and Social Justice*, 17(12), 501–576.
- Donovan, T., Tolbert, C., & Gracey, K. (2016). Campaign civility under preferential and plurality voting. *Electoral Studies*, 42, 157–163.
- Donovan, T., Tolbert, C., & Gracey, K. (2019a). Self-reported understanding of ranked-choice voting. *Social Science Quarterly*, 100(5), 1768–1776.
- Donovan, T., Tolbert, C., & Harper, S. (2022). Demographic differences in understanding and utilization of ranked choice voting. *Social Science Quarterly*, 103(7), 1539–1550.
- Fitzsimmons, E. G., & Mays, J. C. (2021). Yang and Garcia Form Late Alliance in Mayor’s Race, Drawing Adams’s Ire. *The New York Times*.
- Fortin, J. (2020). Why ranked-choice voting is having a moment. *The New York Times*. <https://www.nytimes.com/2020/02/10/us/politics/ranked-choice-voting.html>
- Franko, W. W., Kelly, N. J., & Witko, C. (2016). Class bias in voter turnout, representation, and income inequality. *Perspectives on Politics*, 14(2), 351–368.
- Freedman, D. A. (1999). Ecological inference and the ecological fallacy. *International Encyclopedia of the social & Behavioral sciences*, 6(4027–4030), 1–7.
- Gutiérrez, M., Simmons, A. J., & Transue, J. (2022). Ranked-choice voting and democratic attitudes. *American Politics Research*, 50(6), 811–822.
- Herrnson, P. S., Hanmer, M. J., & Niemi, R. G. (2012). The impact of ballot type on voter errors. *American Journal of Political Science*, 56(3), 716–730.
- Kimball, D. C., & Kropf, M. (2005). Ballot design and unrecorded votes on paper-based ballots. *Public Opinion Quarterly*, 69(4), 508–529.
- Kropf, M. (2021). Using campaign communications to analyze civility in ranked choice voting elections. *Politics and Governance*, 9(2), 280–292.
- Lach, E. (2021). Kathryn Garcia doesn’t want adrew Yang’s praise. <https://www.newyorker.com/news/our-local-correspondents/kathryn-garcia-doesnt-want-andrew-yangs-praise>



- Lamb, M., & Perry, S. (2020). Knowing what you don't know: The role of information and sophistication in ballot completion. *Social Science Quarterly*, 101(3), 1132–1149.
- Lau, R. R., & Redlawsk, D. P. (2006). *How voters decide: Information processing in election campaigns*. Cambridge University Press.
- Lind, Jo T., & Rohner, D. (2017). Knowledge is power: A theory of information, income and welfare spending. *Economica*, 84(336), 611–646.
- Mayer, A. K. (2011). Does education increase political participation? *The Journal of Politics*, 73(3), 633–645.
- McClendon, G. G., Kyle, A. P., Michael, S., & Aura, A. (2019). Will I be able to cast my ballot? Race, income, and voting access on election day. *CSD Report No. 19-36*. Washington University, Center for Social Development.
- McDaniel, J. A. (2016). Writing the rules to rank the candidates: Examining the impact of instant-runoff voting on racial group turnout in San Francisco mayoral elections. *Journal of Urban Affairs*, 38(3), 387–408.
- Neely, F., Blash, L., & Cook, C. (2005). *An assessment of ranked-choice voting in the San Francisco 2004 election*. Public Research Institute, San Francisco State University.
- Neely, F., & Cook, C. (2008). Whose votes count? Undervotes, overvotes, and ranking in San Francisco's instant-runoff elections. *American Politics Research*, 36(4), 530–554.
- Neely, F., & McDaniel, J. (2015). Overvoting and the equality of voice under instant-runoff voting in San Francisco. *California Journal of Politics and Policy*, 7(4).
- Rakich, N. (2021). *The 5 'Political Boroughs' Of New York City*. FiveThirtyEight. <https://fivethirtyeight.com/features/the-5-political-boroughs-of-new-york-city/>
- Santucci, J. (2018). Maine ranked-choice voting as a case of electoral-system change. *Representation*, 54(3), 297–311.
- Sarah, J., & Douglas, A. (2017). Candidate civility and voter engagement in seven cities with ranked choice voting. *National Civic Review*, 106(1), 25–29.
- Sinclair, B., & Alvarez, M. (2004). Who overvotes, who undervotes, using punchcards? Evidence from Los Angeles county. *Political Research Quarterly*, 57(1), 15–25.
- Sondheimer, R. M., Donald, P., & Green (2010). Using experiments to estimate the effects of education on voter turnout. *American Journal of Political Science*, 54(1), 174–189.
- Sunshine Hillygus, D. (2005). The missing link: Exploring the relationship between higher education and political engagement. *Political Behavior*, 27, 25–47.
- Tenn, S. (2007). The effect of education on voter turnout. *Political Analysis*, 15(4), 446–464.
- The Center for Urban Research. (2012). 2010 CENSUS POPULATION FOR NYS LEGISLATIVE DISTRICTS AND CONGRESS. <https://www.gc.cuny.edu/Page-Elements/Academics-Research-Centers-Initiatives/Centers-and-Institutes/Center-for-Urban-Research/CUR-research-initiatives/2010-Census-population-for-NYS-legislative-district>
- Tolbert, C. J., & Kuznetsova, D. (2021). Editor's introduction: The promise and peril of ranked choice voting. *Politics and Governance*, 9(2), 265–270.
- Velasquez, J., Maldonado, S., Ann, C., & Will, W. (2021). Showing up: Map of mayoral candidates' campaign stops highlights value of being there. <https://www.thecity.nyc/2021/7/14/22578035/mapping-nyc-mayoral-campaign-stops>
- Wendland, J., & Carman, E. (2023). New or "normal" election? Understanding ranking activity in New York City's first ranked choice voting election. *Social Science Quarterly*, 104(4), 591–604.
- Whittle, P. (2023). Maine considers ranked choice voting for governor races. *Associated Press*.