Easy as 1, 2, 3? Challenges of the 2020 Census and Implications for Political Science

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ABSTRACT

The core political implications of the decennial census for American politics are well known — as the basis for reapportionment and redistricting — unfortunately, numerous challenges facing the 2020 enumeration, threatening the accuracy and utility of the data. In this paper, we outline key challenges to the 2020 Census, highlighting why political science should be interested not only in the outcomes of the decennial count but also in the process itself.

Keywords: Census; redistricting; apportionment

The U.S. Constitution requires a count of every person living in the United States every 10 years for the purpose of re-apportioning seats in the U.S. House of Representatives. While the most fundamental use of the decennial census is to determine the number of seats a state gets in Congress — and thus voting strength in the Electoral College — the total population count has many other uses. States rely on the decennial count to redraw congressional districts and other political boundaries within a state. Current projections suggest that states won by Republican Donald Trump are likely to gain seats after the 2020 count as the result of population trends over the last decade (Brace, 2019). Census numbers are also used to allocate billions of dollars in federal program funds to states, counties, and cities — in 2017, $1.5 trillion in federal money was distributed based on the 2010 decennial census data (Reamer, 2019). Census data are also the primary source of information about

the nation's population. They inform business decision-making and community planning about government services such as schools, libraries, and hospitals. Social scientists use these data to conduct scientific research about society, economics, and politics. Census numbers provide the benchmark against which every other data collection about the population is evaluated and adjusted, and the decennial count sets the sample frame for surveys throughout the federal statistical system.

The political and economic stakes are clearly high for this once-per-decade population count, but there are many reasons to be concerned about the quality of the 2020 count. The issue is not just the overall numerical accuracy of the total count, but the *distributional accuracy* — the proportional distribution of the population by geography or population groups. Apportionment, the first and most enduring purpose of U.S. census taking is based on statistical proportionality. Yet, a myriad of challenges have disproportionate implications for some population groups more than others. Motivated by cost savings, fundamental design changes were made to the census process — for example, the 2020 count will be the first to be conducted mostly online — that increase the risk that hard-to-count (HTC) populations will be missed.[1] Moreover, the Trump administration's failed effort to add a citizenship question has sown fear and confusion in HTC immigrant communities. Because HTC populations are not equally distributed across the country, an undercount of these populations can have implications for political power. Additionally, it appears that there will be considerable geographic variation in the efforts by local and state governments to ensure that HTC groups are counted — some states are spending millions of dollars on outreach efforts, while other states are spending nothing. In addition to these threats to the completeness and fairness of the 2020 count, the introduction of a disclosure avoidance system using differential privacy raises additional concerns about the quality of the 2020 census data. Finally, the coronavirus epidemic hit the United States just as the enumeration was getting underway, upending operational plans and casting additional uncertainty on the quality of decennial count.

In this article, we outline these key threats to the quality of 2020 Census in more detail, while underscoring the importance of the census for political scientists. We start by providing some relevant background on the process. The decennial census seems like it should be so easy — simply count every person living in the country — but it is in fact an immensely complex and controversial undertaking.

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[1]Households can be hard to count because they are hard-to-locate, hard-to-contact, hard-to-interview, or hard-to-persuade. For more background on these distinctions see Tourangeau *et al.* (2014).

Standards for Evaluating Data Quality in the Census

When evaluating data quality, it is perhaps most common to think only about the overall accuracy of the information collected. However, most conceptual frameworks for quality assessment — including those governing national statistical systems across the world — are far more nuanced and detailed.[2] Since 2002, the U.S. Census Bureau has had formal standards for data quality governing its information products and the processes that generate them. These guidelines require that all information collected and disseminated by the U.S. Census Bureau be designed to ensure and maximize the utility, objectivity, and integrity of the information. *Utility* or "fitness of use" refers to the "usefulness of the information for its intended users;" *Objectivity* means the information is "accurate, reliable, and unbiased, and is presented in an accurate, clear, complete, and unbiased manner;" *Integrity* refers to the security of the information — protection from unauthorized access or revision.[3] This quality framework underlies the Census Bureau mission to "count everyone once, only once, and in the right place."

Critically, objectivity refers not only to the overall accuracy of the information but also to the completeness and fairness of the information — it is possible to have a census in which the overall accuracy of the count is high even as the count of population subgroups is not. This happened in 2010 because non-Hispanic White individuals had a net *overcount* at the same time that Black and Hispanic individuals had a net *undercount.* The difference between population groups is called the *differential undercount.* Given the unequal geographic distribution of HTC groups and geographic variation in outreach efforts to count HTC groups, an undercount of a population subgroup can have negative implications for the allocation of political representation and government funding (Mule, 2012).[4]

Overview of Census Process and Significant Design Changes

Because of the size and scope of the undertaking required to enumerate the entire U.S. population, the Census Bureau engages in years of preparation, research, and testing — planning for the next census starts even before the last count gets underway. Some of the aspects of this pre-enumeration process include significant research and testing of the planned design and engaging

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[2]See, for example, the United Nations national quality assurance framework for official statistics. Also see Biemer and Lyberg (2003).

[3]See the U.S. Census Bureau Statistical Quality Standards.

[4]Estimations of the undercount in 2010 concluded that the estimated percent net undercount for persons for each state and the District of Columbia was not statistically different from zero.

with stakeholders about potential design decisions. Since 1970, the U.S. Census Bureau has conducted an "actual enumeration" of all U.S. households and their demographic characteristics by enlisting the U.S. population in a multi-year, multi-part process that, generally speaking, proceeds in the following steps.[5]

Master Address File: The process starts with the creation of the Master Address File (MAF), a database containing every known housing unit in the country. The creation of the MAF is critical to the decennial count because the Census Bureau uses the MAF at all stages of the enumeration process as the basic list of addresses from which to engage with U.S. households — whether sending a census questionnaire or following up with an enumerator.[6] In previous years, the MAF was created through address canvassing — sending field staff to verify every possible household in the country. For the first time in 2020, the bulk of households will be added to the MAF without field verification, relying instead on in-office address verification through sources such as U.S. postal office records and aerial imaging.

Self-Response and Census Outreach: The Census Bureau then sends a mailing to (almost) every household in the MAF asking households to self-respond to census questionnaire with information about their household. In prior years, that self-response request asked households to mail back a census questionnaire that asked information about each member of the household. For the first time in 2020, the mailing will direct most households to complete the census questionnaire online.[7] Specifically, each household will receive a letter with a unique code to complete the census online. It is also possible to complete the census without the code or by telephone by calling a Questionnaire Assistance Center.[8] In an effort to boost self-response and to encourage participation among anyone omitted from MAF, the Census Bureau engages in a massive advertising and outreach campaign.

Non-response Follow-Up and Imputation: Households that do not self-respond will be visited at least once by an in-person enumerator as part of the Non-response Follow-Up (NRFU) operation. In 2010, the enumerator made six visits to the household in an attempt to count the household; after six failed contact

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[5]An actual enumeration of each household does not imply that statistical estimation is not used — only that the process attempts to collect information directly from each household. For a review of the legal debates regarding the use of statistical methods in enumeration, see Cantwell *et al.* (2004).

[6]As discussed further below, if a household is not included in the MAF, it would be necessary for a household member to initiate contact with the Census Bureau in order to be counted.

[7]Households in census tracts with limited internet access will receive a paper questionnaire along with a unique ID to complete online. A telephone number will also be provided which allows completion of census over the phone.

[8]Census tracts with low levels of Internet connectivity will sometimes be simultaneously mailed a paper form to complete as an option.

attempts, the enumerator would make three attempts to gather household information from a proxy respondent, such as a neighbor, landlord, or postal worker (U.S. Department of Commerce, 2011). In 2020, for the first time, the Census Bureau will use administrative records from federal and state government agencies to enumerate the household after the first enumerator visit is unsuccessful. If the household cannot be enumerated with administrative records, an enumerator will return to the household for at least two more in-person attempts. After three unsuccessful attempts to contact a member of the household in person, the NRFU enumerator will become proxy-eligible.[9] If enumeration-by-proxy fails, the Census Bureau will impute the number of household members and their characteristics based on nearby responding households.[10] In 2020, the Census Bureau has significantly reduced the number of field and staff offices for NRFU operations.

Data Release: Finally, the Census Bureau is required to release the apportionment population counts to the President within 9 months of Census Day (April 1). Within 1 year, the Bureau must release to the states the more detailed population data for the purposes of redistricting. In 2020, the Census Bureau intends to implement a new disclosure avoidance system relying on differential privacy to protect individual responses upon release, which applies to all data products at a geographic level lower than the state (including the redistricting file).

After the enumeration is complete, the Census Bureau conducts an independent coverage assessment to evaluate the accuracy of the census count, including estimates of the differential undercount of subgroups of the population. The coverage assessment relies on two different approaches to determine omissions (i.e., people who *should* have been counted, but were not) and erroneous enumerations (people who *should not* have been counted, but were, including duplications):[11] (1) an independent Post-Enumeration Survey (PES) of a sample of census blocks; and (2) a Demographic Analysis (DA) that compares census results to independent estimates of the population using administrative records, including birth, death, and immigration records, estimates of undocumented immigration, and Medicare data. This independent coverage assessment has consistently found that some segments of the population, including racial and ethnic minorities, are systematically undercounted, although the

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[9]Recent research by the Census Bureau finds significantly lower-quality data if provided by a proxy. For example, Mule (2012) reports that proxy provided data has a correct enumeration rate of 27.1% lower than mail in self-responses, while Rastogi and O'Hara (2012) find the person-linkage rate is 62.9% lower for proxies than mail-in self responses.

[10]The percentage of households enumerated by hot-deck imputation is small — fewer than 1% of households in 2010 (Cohn, 2011). A somewhat larger percent has the characteristics of the household imputed. For example, 4.5% of Hispanic ethnicity was imputed in 2010 (Rothhass *et al.*, 2012).

[11]The general term coverage error refers to any error that results from (1) the failure to include all eligible persons or housing units, or (2) the inclusion of some persons or housing units erroneously. Examples of coverage errors include omissions and duplications.

Race/Origin Domain	2010	2000	1990
U.S. Total	-0.01%	-0.49%	1.61%
Non-Hispanic White	-0.84%	-1.13%	0.68%
Black	2.06%	1.84%	4.57%
Hispanic	1.54%	0.71%	4.99%
Black Differential Undercount	2.90%	2.97%	3.89%
Hispanic Differential Undercount	2.38%	1.84%	4.31%

Figure 1: Recent net and differential census undercounts (Post-Enumeration Survey).

Note: Numbers reported in DSSD 2010 Census Coverage Measurement Memorandum Series #2010-G-01 (Table 7).

undercount for these groups has generally improved in recent censuses. In previous censuses, efforts to improve the differential undercount compared to earlier decennial counts were the fundamental driver of census research, planning, and effort.

Figure 1 reports the Census Bureau's estimates of the net undercount and the differential undercount of Black individuals and Hispanic individuals (compared to non-Hispanic White individuals) in the last three censuses from the independent post-enumeration survey that is conducted for the coverage assessment.[12] As can be seen, non-Hispanic Whites continue to be overcounted in 2010, while Blacks and Hispanics continue to have net undercounts. Figure 2 graphs the differential undercount of the Black population compared to non-Black populations since 1940 based on the Census Bureau's Demographic Analysis. Here we see that the net undercount of Black populations has decreased over time, but the differential undercount between Black populations and non-Black populations has improved little since 1940.[13] A looming question for the 2020 decennial count is how this differential undercount will measure up compared to past enumerations.

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[12]There is variation in the literature as to whether an undercount is represented as a negative or positive number. In this table, a negative number represents an overcount. It is also worth noting that the undercount of some subgroups of racial and ethnic minorities is even worse. For example, the net undercount rate for Black males aged 30–49 in 2010 was 10%, with an omissions rate of 16.7%. And the net undercount is also worse for young minority children — 6.3% for Black children age 0–4 and 7.5% for Hispanic children aged 0–4 (O'Hare, 2019, p. 53).

[13]It is thought that the decreasing proportion of White individuals in the non-Black category masks the extent of the differential undercount. See id. at 30.
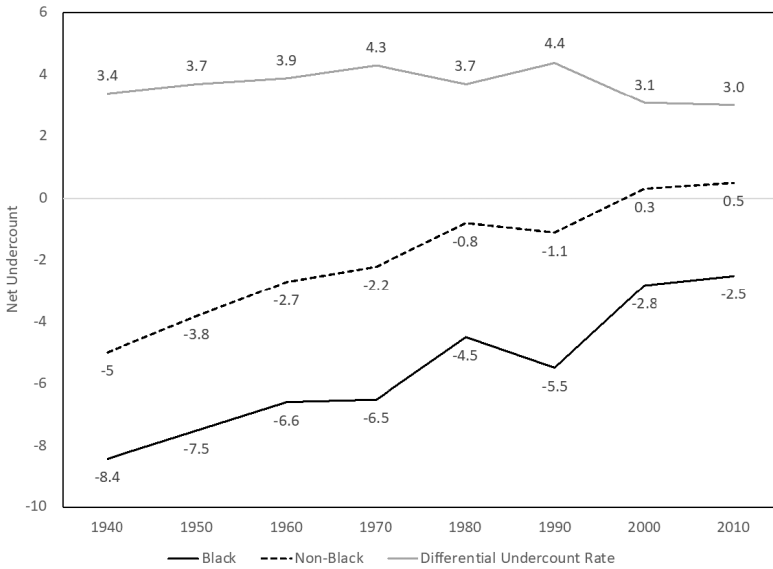
Figure 2: Undercount of Black populations (Demographic Analysis).

Source: Census data as reported in Figure 8.2 of O'Hare (2019). In this figure, the net undercount is represented with a negative number, following O'Hare (2019).

Threats to 2020

Since the very beginning stages of planning for the 2020 count, the Census Bureau has recognized that it was likely to be more challenging to conduct an accurate and complete census compared to 2010.[14] The proportion of the hard to count in the population — immigrants, racial and ethnic minorities, complex households — has continued to grow since 2010. Trust in government has also declined, especially among many of these groups (Schaeffer, 2019; Rainiee and Perrin, 2019). Response rates for all surveys and censuses, including Census Bureau surveys, have declined in recent years. Although the decennial census is different from a typical survey in that it is mandatory, it is not immune from the general decline in response rates afflicting surveys and censuses around the world (Czajka and Beyler, 2016). Completion of the decennial census and the American Community Survey (ACS) are required by law, but prosecutions are almost non-existent. The Bureau is a statistical agency, not an enforcement

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[14]For example, a 2010 report on lessons learned from the 2010 decennial for the 2020 count, the GAO observes that "a complete and accurate census is becoming an increasingly daunting task, in part because of the national's population is growing larger, more diverse, and more reluctant to participate in the enumeration" (U.S. Government Accountability Office, 2010).

agency, and has publicly confirmed that nobody had been fined for failing to participate (Selby, 2014).

1) Inadequate Funding

Despite recognition of the increased challenge for conducting a complete and accurate count in 2020, the Census Bureau has been forced to prioritize cost savings over quality. In 2011, Congress instructed the Census Bureau to spend no more on the 2020 Census than was spent on the 2010 Census, *not adjusting for inflation* (S. Rep. No. 112-78 2011). The Bureau had historically invested considerable research and resources into improving the enumeration of HTC populations because of the consequences for the accuracy and fairness of the decennial count. As summarized by statisticians Seeskin and Spencer (2018): "For at least the last five censuses, high accuracy was sought and spending was adjusted to try to attain it.... By contrast, for the 2020 census, Congress adopted a cost target instead of an accuracy target, and the Census Bureau is held responsible to achieve acceptable accuracy at that cost".

In an effort to meet its cost targets, the 2020 Census was redesigned with major methodological changes. We briefly outline these design changes along with the available evidence pointing to the potential impact on the differential undercount, and highlighting the need for testing to mitigate any anticipated negative effects.

2) 2020 Design Changes

a) Master Address File

One methodological change to the 2020 Census design has been the method for constructing the Master Address File to make use of satellite imagery and administrative records rather than sending canvassers to walk every street to verify each housing unit. An accurate address list is the cornerstone of a quality census because only addresses in the MAF will receive mailed communications from the Census Bureau (which include the link to the online Census form) or an in-person visit as part of the NRFU operation. In many ways, the in-field approach was an inefficient use of Census Bureau resources. However, the changes have also created concerns about how potential changes could disproportionately miss hard to count communities. One reason for an undercount of racial and ethnic minorities is that they live in unusual or concealed housing units.[15] Large ethnographic studies in a number of different localities confirm "irregular housing," such as informal conversions from single family to multi-family arrangements as one reason for undercounts (De la Puente, 1993; Kissam *et al.*, 2019; Terry *et al.*, 2017). While satellite imagery and administrative records are useful for identifying newly-constructed housing

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[15]For a review of the literature, see reports by Kissam (2016) and O'Hare *et al.* (2016).

or structures, their utility in identifying unconventional housing arrangements remains unclear. According to an Office of the Inspector General (OIG) investigation, the address canvassing portion of the 2018 Census Test had significant issues and inaccuracies — 61% of the 433 locations tested showed significant differences between the in-office and in-field results (U.S. Office of Inspector General, 2019). The investigation reported that a 2016 test estimated that 1.4 million households could be missed as a result of inaccuracies from in-office canvassing. Because of these results, the Census Bureau has increased the in-field canvassing — but it is still not clear if they are doing so in the right areas of the country and in ways that mitigate the potential impact on the undercount. As reported in the latest operational plan, the Master Address File Coverage Study was "paused in FY2017 due to budget considerations" (U.S. Census Bureau, 2018). The canceled Master Address Coverage Study had been the way the Census Bureau planned to "locate areas that are in need of in-field address canvassing" and "generate national and sub-national estimates of MAF coverage" (Boyd *et al.*, 2016). As reported by the OIG, the Census Bureau has not evaluated "which populations or regions will be most affected by the missed households." Moreover, the Bureau "has not conducted any analysis to show that [proposed mitigation] strategies will fix the problems — and does not plan to conduct any analysis before the 2020 decennial census. As a result, the Bureau does not know how the error rate of in-office address canvassing will affect the quality of the 2020 decennial census" (U.S. Office of Inspector General, 2019).

Localities have the opportunity to validate and supplement the addresses through community-based address canvassing as part of the Local Update of Census Address (LUCA) program. For communities that participate, it can be one way to help identify unconventional housing units and potentially reduce the undercount of minority communities. Researchers found that community-based canvassing identified hidden housing units that otherwise would have been omitted from MAF, and that these units were overwhelmingly minority households: "the neighborhoods where in-field community-based address canvassing added newly-identified housing units are mostly ones with high proportions of households headed by noncitizens, racial/ethnic minority respondents, and heads of household with lower-than average educational attainment" (Kissam *et al.*, 2018). In Missouri, such efforts added over 100,000 addresses, 4% of their total housing units, to the MAF in time for the 2020 Census (Suntrup, 2020).

Unfortunately, LUCA participation has been uneven across the country with some local areas vigorously seeking to improve the MAF, but other jurisdictions doing little or nothing. For example, California budgeted $7 million for LUCA efforts in order to overcome the challenges faced in areas with unconventional housing situations (Jibilian, 2019). In Texas, in contrast, there are many border areas with HTC tracts that had neither a county nor
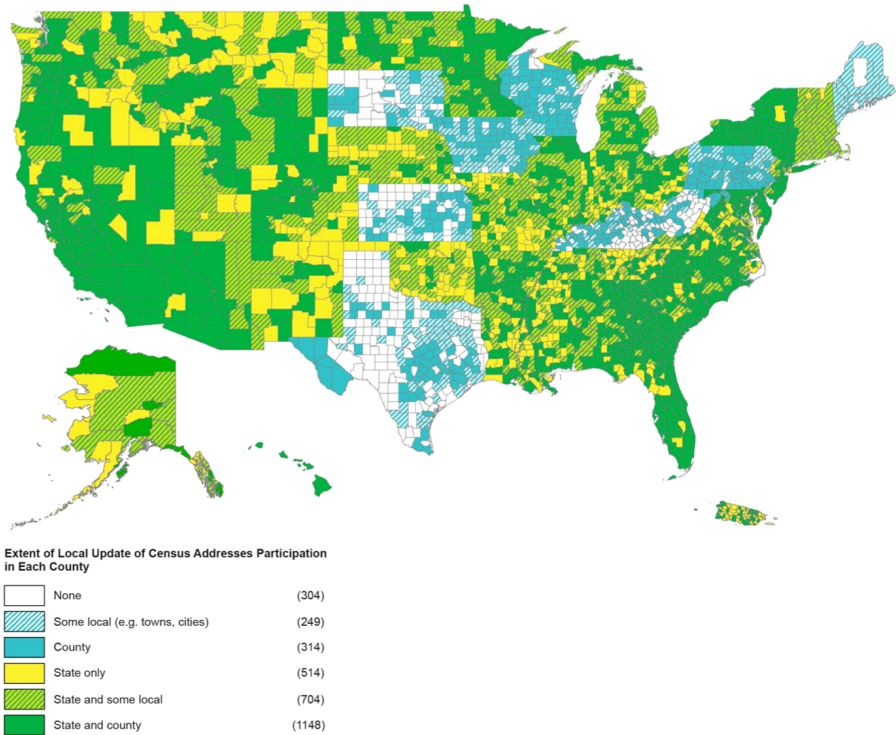
Extent of Local Update of Census Addresses Participation in Each County

	None	(304)
	Some local (e.g. towns, cities)	(249)
	County	(314)
	State only	(514)
	State and some local	(704)
	State and county	(1148)

Figure 3: Variation in LUCA participation.

Source: GAO-20-17 report. LUCA Participation as reported by GAO analysis of Census data.

state-level LUCA partnership. Figure 3 depicts the extent of LUCA participation at the county level, as reported in a recent GAO report (U.S. Government Accountability Office, 2019). Although some areas have state, county, and local engagement with the LUCA program, a handful of locales across the country — especially in Texas, Kansas, South Dakota, Kentucky, and West Virginia — are not covered by participation at any level of government.

b) Internet Self-response

The 2020 Census will be first census in which the majority of households will self-enumerate online. Although this is a design change that could make completion of the census more convenient for many households, there is also considerable evidence that it could exacerbate the differential self-response of racial and ethnic minorities. There are well-recognized disparities in access and comfort with the Internet across racial and ethnic groups. A 2018 Census Report

shows that 73% of Black households have an Internet subscription compared to 84% of non-Hispanic White households (Ryan and Lewis, 2017). It is not simply a gap in access, however. In the 2016 American Community Survey (ACS),[16] just 23% of Black households responded by Internet compared to 43% of White households (O'Hare, 2019, p. 156). In other words, Blacks are more reluctant to self-respond online *even when they have Internet access* (Beatty and Cantwell, 2015). Given research showing racial and ethnic minorities have lower trust in government, greater concerns about census confidentiality, and greater fears of repercussions from completing the census, it should be no surprise to find resistance to completing the census online, given recognized risks of cyberattacks and data breaches (Hamby, 2019; McGeeney *et al.*, 2019).

Moreover, last minute changes to the online response system to be used by the Census, as well as the recent technological debacle in the 2020 Iowa presidential caucus have raised concerns among lawmakers about the actual security of the online platform — as well as perceptions of that security (Ross, M. (Ed.), 2020). A report released by the Government Accountability Office (GAO) in February 2020 placed the 2020 Census on the GAO's High-Risk list and described the readiness of the Census Bureau as "mixed" (U.S. Government Accountability Office, 2020). Specifically, the report noted that the Census Bureau still needed to fully test their new online system, as well as finalize contingency plans for any potential disruptions. Any notable technological issues early in the process would do little to assuage concerns about data privacy and confidentiality among some groups in the population. Public opinion surveys show that Blacks and Hispanics are generally more concerned about Internet data security, digital privacy, and the threat of hackers.[17]

c) Changes to NRFU Operations[18]

In previous censuses, in-field enumerators visited the home of every household that did not self-respond to the census, as many as six or more times if needed. In 2020, administrative records will play a central role in the NRFU portion of the decennial count. If a household is not counted after one visit from an in-field enumerator, administrative records will be used to identify vacant households and to fill in the responses if the administrative records are deemed to be of adequate quality. In a study of public opinion toward the use of administrative records, census researchers explicitly acknowledge:

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[16]The American Community Survey is an ongoing survey conducted by the Census Bureau that collects socioeconomic and demographic information about the population that was once collected by the decennial census long-form. See U.S. Census Bureau, About the American Community Survey, https://www.census.gov/programs-surveys/acs/about.html.

[17]An AP-NORC Poll from April 2018, for example, found that 58% of Black social media users were concerned about hackers gaining access to their data compared to 36% of White social media users (Associated Press-NORC, 2018).

[18]A fourth design change — re-engineering field operations to increase use of technology and reduce staffing and infrastructure — is discussed in the next section.

"Due to the increasing and unsustainable cost of conducting censuses in the traditional manner, the Census Bureau is looking to leverage administrative records housed elsewhere in the government to supplement and/or replace costly non-response follow-up operations in future censuses" (Bates *et al.*, 2012).

Unfortunately, administrative records are less available and lower quality for racial and ethnic minorities (Griffin, 2014). A concern is that the lack of administrative records for hard to count groups could increase the likelihood that occupied non-White households get mistakenly classified as vacant (U.S. Government Accountability Office, 2017b). Indeed, census research using administrative records predicted a higher frequency of vacant households than indicated in 2010 in areas with a high concentration of Blacks (U.S. Government Accountability Office, 2017b, p. 6). Another concern is that the use of administrative records increases the risk and perception of risk about the confidentiality of the census, which disproportionately affects Black and Hispanic households. Census research examining public opinion toward administrative records found that Blacks and Hispanics were less likely than Whites to say that they would prefer to have their household enumerated using administrative records rather than with an interviewer coming to their homes. Despite concerns raised by stakeholders and advisory committees, the Census Bureau has not directly evaluated the impact of the use of administrative records on the count of HTC households (U.S. Census Bureau, 2016). When they raised the need for additional research and testing, the Census Scientific Advisory Committee (on which Hillygus served) was told that testing "could not be extended simply because time is too short" (Dillingham, 2019).

In addition to changing the NRFU operations, the Census Bureau has reduced the field staff and offices. Despite a larger population, more hard-to-count households, and an anticipated lower self-response rate, the Census Bureau is budgeting for fewer enumerators and assuming a higher productivity rate. The Census Bureau has also increased the staff to supervisor ratio from 1:8 in 2010 to 1:20 in 2020, despite concerns by the OIG and GAO regarding an observed failure to adequately manage staffing during census tests (U.S. Census Bureau, 2017; U.S. Government Accountability Office, 2017a).

In short, each of these design changes was explicitly motivated by potential cost savings. While many of these changes have the potential to make it more efficient to count the easy-to-count households, inadequate funding through the decade has meant we do not have a clear understanding of these changes that will impact the enumeration of hard-to-count households. As the GAO has repeatedly noted, design changes introduce risks and require substantial investment in research and planning (U.S. Government Accountability Office, 2017c). The National Academy of Sciences (NAS) recommended and supported design changes but emphasized that "the matter of implementing them should

be guided by research on how each type of change may influence the tradeoff between census accuracy and cost" (National Research Council, 2011).

Unfortunately, Congress has jeopardized the quality of the 2020 count by providing inadequate funding through the decade. For the first 7 fiscal years of the decade, Congress allocated less than the Bureau requested, resulting in reductions in research and testing. Former Director John Thompson has said that the Bureau "has been underfunded by about $200 million to produce the kind of census that they were planning" (Gunter, 2017). Some of the specific delays and cancellations include cancellation of 13 of 25 initially scheduled tests from the 2010 Census designed to inform the 2020 Census; delays in field tests and preparatory work related to 2014 field tests (Mesenbourg, 2013); delays in 2015 Census test outreach limited activities; funding limitations meant there were no non-English language television ads (Vines, 2015), cancellation of the 2017 Master Address File Coverage Study; cancellation of field tests in Puerto Rico, the Standing Rock Reservation in North Dakota and South Dakota, and the Colville Reservation and Off-Reservation Trust Land in Washington state; delays in work on the Integrated Communications Contract in 2017; delays in hiring partnership specialists and opening regional census offices in 2017; cancellation of the 2018 End-to-End tests in Washington state and West Virginia, and cancellation of coverage assessments of the 2018 End-to-End Test. The consequences of test cancellations can be difficult to quantify but are widely recognized to impact both cost and quality. In 2011, then-Director Robert Groves pointedly concluded "[a] cut of this magnitude in our periodic programs account means we cannot do all of the work that Congress has asked us to do" (Groves, 2011).

These delays and cancellations have left the Census unable to adequately assess how various census design changes might impact the enumeration of HTC households. An OIG report concluded that two of the canceled evaluations of the 2010 census were "critical to informing the 2020 undercount," whereas another cancellation meant that there was no testing of new procedures for Native American households — a group that was undercounted by 4.9% in 2010 (U.S. Office of Inspector General, 2012).[19] Moreover, the Census Bureau acknowledged that delays in the communication campaign could detract from their ability to mobilize people and "lead to lower response in 2020 and additional non-response follow-up workload." Even the 2018 End-to-End test was far from a full "dress rehearsal," as the cancellation of three coverage measurement operations from the scope of the test meant it was not even possible to estimate the undercount in the 2018 field test. Moreover, testing in Providence County, Rhode Island — a county that is majority White with

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[19]In recognition of this, the Bureau said that it would consider adding the sites to the 2018 End-to-End Census Test, but that did not happen. See Census Bureau Director's Blog (Thompson, 2016).

widespread broadband access — offered little insight into enumerating HTC areas.[20]

3) Citizenship Controversy

The threat that these design changes pose to the accuracy of the 2020 Census has been amplified by the recent controversy surrounding the Trump administration's attempt to add a citizenship question. In 2018, Secretary of Commerce Wilbur Ross announced that the 2020 Census would be asking respondents to report their citizenship status, stoking concern among many about how such information might be used. While the reasoning provided was that such data would permit more effective enforcement of the Voting Rights Act (VRA), the Supreme Court blocked the addition of this question in 2019 stating that "the VRA enforcement rationale — the sole stated reason — seems to have been contrived" (Dept. of Commerce v. New York *et al.*, 2019).

Although a legal battle was successful in preventing the question from being added in 2020, concerns among immigrant communities linger. The rhetoric surrounding the addition of the citizenship question has politicized the 2020 Census, distracted staff, diverted resources, and enflamed distrust among immigrant communities. A report of the National Latino Commission on Census 2020 observed "even if the federal government now removes the citizenship question, it has impaired the Census. It has intensified suspicion of a project that requires trust and that lies at the foundation of our democracy" (NALEO, 2019, p. 14). The 2018 End-To-End Census Test in Rhode Island was occurring when the controversy erupted; even though the test questionnaire did not include the citizenship question, there were still difficulties in gathering responses from noncitizens (Wang and Peñaloza, 2018). An independent follow-up study of the public's experience with the 2018 Census Test, conducted by the NALEO Educational Fund, found that respondents and civic leaders in the area believed that the citizenship announcement directly influenced participation in the test (Escudero and Becerra, 2018). Results from the 2020 Census Barriers, Attitudes, and Motivators Study similarly show that racial and ethnic minorities are more concerned than Whites about how their data will be used (Evans *et al.*, 2019).

It also seems likely that not everyone will realize that the questionnaire will not include a question asking citizenship status. The Census Bureau intends to spend millions on a 5-month advertising campaign that emphasizes the confidentiality of responses, including $50 million being spent on ads that target Latinos and $40 million on ads geared toward African Americans (King,

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[20]According to FCC, broadband access is 99% and adoption is greater than 80%. See Mapping Broadband Health in America 2017, FCC, https://www.fcc.gov/reports-research/maps/connect2health/background.html; According to the 2010 Census, 66% of the population is non-Hispanic White.

2020). However, the ads focus primarily on confidentiality and fail to clarify the status of the citizenship question for these groups. A survey of Latinos in 2020 found that 48% of respondents still believed that there would be a citizenship question on the Census, with 61% of respondents expressing concerns that immigration enforcement could use the Census data against their family (Vargas and Escobedo, 2020).

Moreover, the Trump administration has still directed the Census Bureau (Exec. Order No. 13880) to identify the citizenship status of every individual in the 2020 Census through administrative records from the Department of Homeland Security and other federal agencies. It was recently revealed that the Census Bureau had requested DMV records, including citizenship status and eye color, from state governments, although many are refusing the request. The directive requires production of citizen-only voting age population (CVAP) by race and ethnicity at the block level. The creation of the data file increases Census Bureau's risk of being viewed as an enforcement agency that cannot be trusted to keep collected information confidential. Notably, the executive order spells out a separate motivation for creating such a measure by stating that the file will be sent to each state to allow for redistricting on the basis of voter-eligible population rather than total population. It seems likely that this effort could still negatively affect attitudes of the Census Bureau by immigrant communities, who may fear that the Census Bureau is an enforcement agency.

4) Covid-19 Pandemic

Since the time this essay was first written, a new threat to the decennial count has emerged in the coronavirus pandemic. As a result of the crisis, the Census Bureau has postponed or delayed field operations and reduced staffing at questionnaire assistance centers and at facilities that process paper questionnaires (U.S. Census Bureau, 2020). In-person counts of the homeless, remote communities, American Indian tribal communities, and Puerto Rico have all been delayed or suspended. The Census Bureau has been forced to modify and delay its Group Quarters Operation, which counts college dormitories, nursing homes, and prisons. The NRFU operation — in which enumerators go door-to-door to count households that do not self-respond — has been delayed by at least one month. Community partners have had to suspend outreach activities. As of March 2020, self-response rates were lagging far behind where they were in 2010, raising new concerns about the implications for the counting of HTC households.

Variation in State-Level Efforts

Given the many challenges facing the 2020 count, many states and local governments are stepping up. Unfortunately, there is considerable variation in

the extent to which states are investing in additional outreach efforts. To help ensure an accurate population count, lawmakers can allocate state funds for Census outreach, as well as form state-level Complete Count Committees (CCC) to organize and coordinate such efforts throughout the state. Though states began establishing such committees as early as 2018, Florida and Louisiana only just created their committees at the start of 2020. Moreover, three states, South Carolina, Nebraska, and Texas, have declined to spend anything on Census outreach and refused to form a state-level CCC, instead relying on efforts from volunteer organizations (Wines and Del Real, 2019).[21] In fact, Nebraska's governor Pete Ricketts signed a proclamation of support for the Census, but vetoed efforts to form a committee, leaving it up to "Nebraskans on the local level to be able to get a complete count for the census" (Costello, 2020).

Even those states that have established Complete Count Committees vary in the extent to which they invest state funds into Census efforts. For instance, the state of California has allocated $187 million for Census efforts, with the next closest spender being Illinois with a $30 million budget. The extent to which states are investing in Census efforts is perhaps best illustrated in Figure 4, which displays per capita spending by state. As seen, there are a number of states, such as Kentucky and Arkansas, that have formed a state-level CCC, but have not set aside any additional funds for Census purposes. Though Alabama, Mississippi, and Georgia have each established a state-level CCC, and invested in Census efforts, their Census spending amounts to less than .50 cents per resident. Meanwhile, states like Washington and Illinois have set aside more than $2 per resident in their efforts to obtain a more accurate count. Notably, California outpaces the rest, spending more than $4.73 per capita on Census outreach.

In sum, the threats to the 2020 census elevate the importance of outreach, especially to the hardest-to-count communities. At the same time, the dramatic variation in state and local efforts could ultimately contribute to distributional inaccuracies in the population count.

Why Should Political Scientists Care?

While the potential inaccuracies in the 2020 Census should be enough to garner the attention of political scientists — given the implications for the distribution of political power and economic resources in the coming decade — we want to highlight here two specific topics of relevance to political scholars.

First, election scholars should be aware of the significant legal and administrative uncertainties that make it difficult to predict and prepare for the

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[21]See the 2020 Census Resources and Legislation page of the National Conference of State Legislatures website for a full breakdown of spending efforts by state.
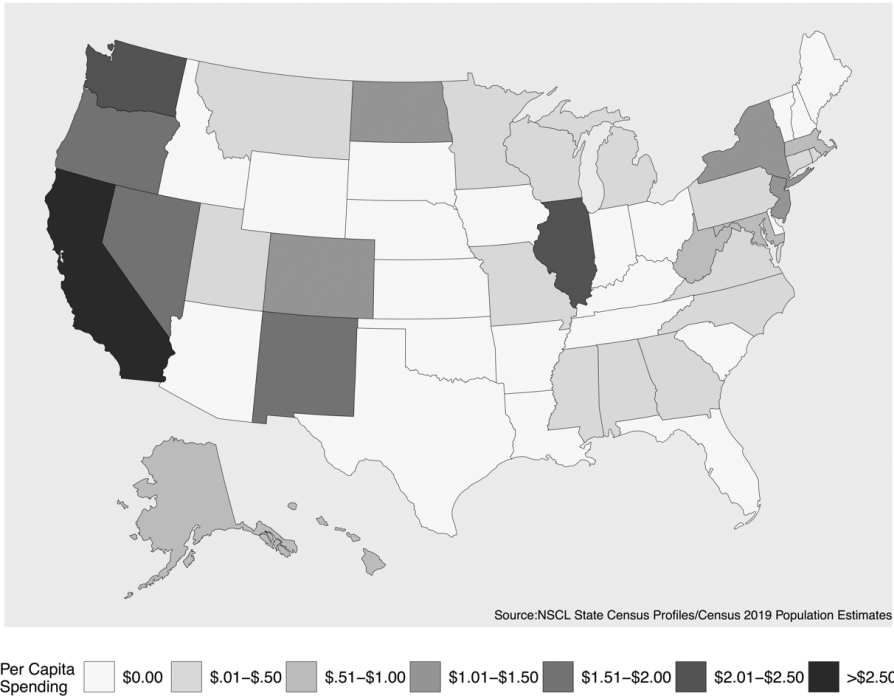
Per Capita Spending on Census By States

| Per Capita Spending | $0.00 | $.01–$.50 | $.51–$1.00 | $1.01–$1.50 | $1.51–$2.00 | $2.01–$2.50 | >$2.50 |

Figure 4: Variation in per capita spending on Census.

Note: Data from the NCSL State Census Profiles and Census Estimated Populations for 2019. The NCSL State Census Profiles list the amount each state has allocated for Census purposes such as outreach. This amount listed for each state was then divided by the state's population estimates for 2019 and subsequently broken into categories of interest.

redistricting process and outcomes following the 2020 Census. The challenges discussed above have already prompted lawsuits regarding potential distributional inaccuracies in the count and it seems likely that other administrative challenges or lawsuits after the enumeration will be forthcoming (NAACP v. Bureau of the Census, 2019; Center for Popular Democracy Action v. Bureau of the Census, 2019).[22] Given that lawsuits about redistricting after the 2010 decennial count are not yet all resolved just months before a new count is set to begin, many have come to expect some degree of uncertainty in redistricting. The bigger question, stemming from Trump's executive order, is if states will

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[22]The 2010 Count Resolution Program offered localities the opportunity to challenge population estimates, but any corrections made did not impact re-apportionment or redistricting files.

use CVAP for redistricting (Macagnone and Ruger, 2019). Although no states have as of yet requested CVAP from the Census Bureau, a 2016 Supreme Court ruling left an open question as to the legality of excluding noncitizens. In *Evenwel vs Abbott*, the Supreme Court ruled that the total population may be used to draw districts but left open the question of whether states could voluntarily draw maps based on something other than state population, such as voter-eligible population. Justices Alito and Thomas separately wrote opinions interpreted as inviting a case to settle the law.

There is also already precedent for redistricting based on alternative population counts. For example, Hawaii has excluded non-resident military personnel and students when drawing state legislative districts since 2013, and some states count prisoners at their last known address rather than where they are held.[23] Several states also exclude prisoners whose last known residence is out-of-state or not known.

Alabama is attempting to go a step further and narrow the population used for the purposes of apportionment and federal funding (Wang, 2019b). In a lawsuit filed against the Census Bureau in 2019, Alabama argues that undocumented immigrants should not be included in apportionment calculations. Setting aside how Alabama's arguments will square with the U.S. Constitution, it is entirely unclear how the Census Bureau would exclude undocumented immigrants from their apportionment counts — CVAP indicates only if someone is a citizen or noncitizen, with no information about their legal status. And it is not feasible to get a reliable number of undocumented immigrants at the state level (much less at lower levels of geography). As a recent article in *The Hill* explained, "No one knows exactly how many undocumented aliens are in the United States, or from where they come. Most estimates range wildly, from 10 million to 22 million."[24]

Undoubtedly, the accuracy of any estimates of legal status and citizenship status is likely to be questioned. The Census Bureau has yet to outline how exactly it plans to create CVAP to fulfill the request of Trump's executive order. The Executive Order not only instructed the Census Bureau to estimate citizenship based on administrative records but also sought to give "access to all available records" by "ordering all agencies to share information requested by the Department to the maximum extent permissible under law" (Exec. Order No. 13, 880 2019). However, it remains unclear how the Census Bureau will reconcile conflicting or incomplete administrative records.[25] Research provides

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[23]In fact, Hawaii's exclusion of non-residents in their redistricting process has been upheld by a federal district court (Kostick v. Nago, 2012) and was reaffirmed by the Supreme Court.

[24]https://thehill.com/opinion/immigration/447607-illegal-immigration-by-the-numbers-visa-violators-and-border-crossers.

[25]Estimating legal status is even more complicated since undocumented households will be less likely to be in administrative records. Current approaches tend to rely on the residual

evidence that linking the administrative records of immigrant households is often unsuccessful (Bhaskar *et al.*, 2018). Additionally, certain administrative records (such as those from the Social Security Administration) may have a dated measure of citizenship, owing to delays in capturing instances of naturalization, and may need to be reconciled with other data sources (Brown *et al.*, 2018). Although the Department of Homeland Security, U.S. Citizenship and Immigration Services, and U.S. Immigration and Customs Enforcement have agreed to provide data, a number of states turned down the Census Bureau's request to provide driver's license records (Wang, 2020, 2019). The Census Bureau had planned to set the methodology for estimating CVAP by May 31, 2020 (Schneider, 2019), but the coronavirus crisis has since pushed that deadline to October — giving very little time to contend with possible challenges.

A second related topic of relevance to social scientists is the planned use of differential privacy, a new approach for protecting the confidentiality of individual responses.[26] Improvements in computing power and data accessibility have created significant disclosure risks through database reconstruction (Dinur and Nissim, 2003).[27] A disclosure avoidance system that uses differential privacy injects random noise into a data set in a way that mathematically protects the privacy of individuals; a database can be considered differentially protected if the information it yields about someone does not depend on whether that person is part of the database (Drechsler and Reiter, 2019; Dwork *et al.*, 2016). The planned move to differential privacy has been the source of considerable controversy and concern. Although often not recognized, the Census Bureau had already been perturbing the raw data for the sake of disclosure avoidance, primarily through information reduction (e.g., coarsening responses) and through a process of household swapping — ad hoc tweaks with unproven effectiveness (Dajani *et al.*, 2017). Differential privacy offers a formal, mathematical guarantee of privacy. At the same time, there is considerable uncertainty about the implications for social science research and other census data uses.

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approach by first estimating the total noncitizen population (often using survey-based measures) and then subtracting those who with legal documentation. The Census Bureau has found that among those identified as noncitizens in administrative records that more than 40% said they were citizens in the ACS.

[26]For a non-technical primer on differential privacy, see Wood *et al.* (2018). http://www.jetlaw.org/wp-content/uploads/2018/12/4_Wood_Final.pdf.

[27]Research has long shown that "de-identified" data — in which personal identifiers are removed — can be re-identified through record linkage (Sweeney, 2002); more recently, it has been shown that individuals can be re-identified through aggregate statistics alone (Dwork *et al.*, 2016). It was estimated that published statistics and data products from the 2010 Census released 25 statistics per person (Abowd and Schmutte, 2019).

There is a fundamental tradeoff between privacy and accuracy — the more accurate the data released, the greater the disclosure risk.[28] A differential privacy system requires explicitly setting in advance where to balance that tradeoff (called the privacy loss parameter).[29] This parameter can be thought of as a "privacy budget" that can be spent through different statistical outputs or data products. Unfortunately, this requires that all computations be known in advance; exactly if and how that can be done remains an "open question," according to John Abowd, the Chief Statistician of the U.S. Census Bureau (Abowd and Schmutte, 2019). Moreover, given the increased risk that accumulates with each new statistic or data product, there are likely to be restrictions put in place. For example, differential privacy is expected to prevent the release of census microdata (PUMS) and detailed race and Hispanic origin tables (Ruggles, 2018).[30]

In addition to concerns about the availability of data, there are significant concerns about the accuracy of the data that will be produced. Redistricting experts might worry about the precision of numbers for drawing political lines. On the one hand, differential privacy will better document uncertainty that was not being acknowledged in previous data products. At the same time, there are some methodological decisions that could leave the estimates vulnerable to challenge. For example, it appears that a rounding decision regarding differential privacy could create bias that disadvantages urban areas. The Census Bureau has chosen to restrict noise infusion so that: (1) the census-block counts produced are always non-negative whole numbers, and (2) the state-level count remains invariant (Boyd, 2019). This means that small census-block counts get larger (to avoid dipping below 0), and large census-block counts will tend to get smaller (to compensate). While this method leaves state-level counts intact, the population shifts at the census-block level could have implications for the distribution of power. For instance, a private mapping company, Caliper, showed significant differences in congressional districts using 2010 census data with differential privacy applied, compared to what actually happened (Caliper, 2019).[31] They found that using differential privacy techniques in the 2010 Census would have shifted the population from urban to rural census blocks at the Congressional district level, and dramatically altered how Congressional districts were drawn.

Though Trump's Executive Order notes that the citizenship data currently collected by the American Community Survey suffers from "deficiencies" and

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[28]It also impacts the utility of the data, in the language of the Census Bureau Quality Standards.

[29]The specific setting for the parameter is a policy decision, likely to depend on the particular application.

[30]Also see: https://assets.ipums.org/_files/ipums/intro_to_differential_privacy_IPUMS_workshop.pdf.

[31]https://www.caliper.com/press/pr20191114-differential-privacy.htm.

contains a "substantial margin of error," Abowd acknowledges that the noise introduced by differential privacy could actually make for less precise estimates than currently available from the ACS. The addition of the citizenship variable to the other census characteristics would require significantly more noise be injected into the data to protect against re-identification of individuals. This is because census blocks are defined by land area, and the number of people within a given census area varies. For instance, 30% of census blocks in California are comprised of less than 10 households, and in some rural areas, such as Sierra county, an estimated 25% of census blocks consist of only a single housing unit (Kissam *et al.*, 2018). The amount of noise necessary to avoid a violation of Title 13, which prohibits disclosure of any individual household's census responses, could drastically undermine the utility of CVAP.

Conclusion

It is perhaps obvious that political scientists should care about the decennial census count simply because the outcome of the enumeration is used for the distribution of political power and economic resources and is the foundation of the federal statistical system. We believe, however, that the unique challenges facing the 2020 enumeration highlight why the field should be interested not only in the outcome of the count, but also the process itself.

As we have outlined, the methodological decisions surrounding the collection and protection of the data could have downstream implications for politics and for political science. Cost-saving changes to the process, coupled with the public debates surrounding the citizenship question, could increase the undercount of certain communities, thereby undermining the distributional accuracy of the census data. Efforts to improve these counts and translate population into political power vary greatly across states and appear driven by strategic partisan interests. These data quality issues are already entwined in political and legal debates in which political scientists are likely to be involved. At the same time, these challenges could have implications for our ability to use the resulting data. Census numbers are critical to the study of a variety of political science research topics related to election administration and the evaluation of policy impacts on turnout. While there are reasons to be concerned about the issues outlined, there are also clear opportunities to evaluate how methodological changes for the 2020 enumeration, such as differential privacy, might have implications for existing political science findings.

Beyond the implications of data quality issues, the census process itself offers myriad opportunities for testing fundamental political science theories, ranging from civic attitudes and behaviors, communication effects, survey methodology, and institutional decision-making. For instance, recent work finds a significant decrease in the number of elected offices following enactment

of the VRA, especially in Southern counties with active Black populations
(Komisarchik, 2018). Political scientists could help identify whether such
strategic institutional decision-making extends to state- and local-level census
efforts. Moreover, scholars could assess whether the civic attitudes and motiva-
tions that underlie electoral turnout also influence census participation. While
past work has found that identity-based appeals effectively motivate turnout
among certain minority communities, studies find that privacy attitudes weigh
heavy on census participation (Singer *et al.*, 2003; Valenzuela and Michelson,
2016). A study on the effectiveness of outreach campaigns could exploit this
tension and assess whether privacy attitudes act as a scope condition for
identity-based appeals. Political scientists have already expressed concerns
with the measurement of race in the census, which includes Latino as an ethnic
rather than a racial category (Alba, 2018). Scholars might build on research
by the Census Bureau itself, examining how changes to the measurement of
race influence individual responses, and assessing whether the predictors of
identifying as a given race change when Latino is included.

Census research has for too long been considered the wheelhouse of demog-
raphers, sociologists, and statisticians — but it is clear that political incentives,
interests, and decision-making are at the heart of the creation and use of
census numbers, and thus touch upon fundamental political science theories.
By outlining the challenges faced by the 2020 Census, we hope that political
scholars will see new opportunities to generate knowledge. Such efforts would
not only contribute to the political science literature but could also have an
impact on society at large.

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