

# Does It Takes a Village to Legislate?

Measuring the Effect of Proportional Descriptive Representation on Legislature Policy  
Responsiveness

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## **Abstract**

The literature on collective descriptive representation has relied on a simple measure of the proportion of a group in the larger body. This measure, however, fails to capture the larger group dynamics that come as a result of the zero-sum relationship in representation. Relying on the proportional representation to form a normative equilibrium in descriptive representation, I develop a theory of how competing representation demands interact to produce substantive representation. I adapt a measure of multi-group representation from the proportional representation literature and employ it to test the theory. Using data on state legislative chambers in 2003, I find that higher levels of proportional representation for gender are associated with closer policy congruence between the state population and the legislative chamber, while I find the inverse relationship with race. The results show the flaws of prior measures of descriptive representation and provide mixed support for claims that descriptive representation who claim it produces substantive representation.

# 1 Introduction

Does descriptive representation produce substantive representation? This question has been the source of debate within the descriptive representation literature and is loaded with normative implications. Both supporters of descriptive representation and critics claim support from the literature, while the normative demand for equality in representation has seen growing numbers of women and racial minorities running for public office. The resulting potential increase in descriptive representation raises the urgency for this debate to be resolved. Should the literature arguing that descriptive representation can produce harmful consequences have merit, these minority candidates could be undermining their own interests. However, their historical underrepresentation and marginalization forces them to run, and compels political science to conclusively answer the long-running debate.

This paper contributes to this debate by focusing on a methodological and theoretical shortcoming of the existing literature, studying collective descriptive representation one identity group at a time, that has hindered the development of a holistic judgment on the benefits of descriptive representation. I introduce a new measure to account for the descriptive representation of multiple identities simultaneously and use it to demonstrate how descriptive representation can impact at least one benefit: policy responsiveness.

In this paper, I begin with a discussion of the theoretical underpinnings of representation before examining the proportional representation literature for insights. I then turn to the state of the literature on the benefits of descriptive representation and illustrate how its focus on only one identity at a time has limited its ability to fully analyze the impact of descriptive representation. Bridging the literatures on proportional and descriptive representation, I then outline a theory of proportional descriptive representation that addresses the methodological concern and presents a means by which to test a theorized benefit of descriptive representation, policy responsiveness. I then test the model using a newly assembled data set and discuss the results and implications. While the findings fail to support the theory of proportional descriptive representation discussed below, the findings are not without substance, suggesting that increasing descriptive representation of gender

identities to proportionality will improve policy responsiveness in state legislative chambers.

## 2 Concepts of Representation

Before turning to the substance of this paper, I begin by explicating my approach towards descriptive representation from other uses in the literature. Descriptive representation has been studied in two broad categories: dyadic and collective (Harden and Clark 2002). While many authors do not clarify which they are referring to, it is important to do so in order to clarify the level of analysis. Dyadic descriptive representation operates on the legislator-level and refers to the relationship between a constituent and their legislator, while collective descriptive representation operates on the legislature-level and deals with the relationship between a representative group and the population that is being represented. Dyadic descriptive representation can have important implications on legitimacy, participation, trust, and efficacy — primarily delivering effects within the domain of constituents. Collective descriptive representation can produce constituent-level effects, but, more importantly for the purposes of this paper, also has effects on the behavior of the legislatures. While there has been extensive research conducted on dyadic representation with important implications, this paper focuses on collective representation to produce a macro-level analysis of its implications for legislative behavior.

A second element worth discussing is the distinction between descriptive representation as symbolic representation and descriptive representation as substantive representation. Substantive representation reflects a connection between the interests of the representative and the interests of the represented, while symbolic representation, as defined by Smith, Pinderhughes, and Jones signifies a descriptive representative who fails to deliver substantive representation (as cited in Swain 1995). Alternatively, symbolic representation can be conceived of as the elements of descriptive representation that do not have to do with the expression of interests. In this way, a representative can be both symbolically representative and substantively representative. Symbolic representation is not insignificant, as Mansbridge (1999) notes that it can deliver often overlooked psychological benefits. There exists a dispute in the literature on descriptive representation on whether it produces substantive or symbolic benefits. I discuss this debate further in a later section.

Before concluding this section, I address an underlying assumption of this paper, and the wider descriptive representation literature, which is that members of groups have shared interests. I do not assume that every member of a group shares a single interest, however there is strong evidence to support the assumption that a majority of the group holds similar interests. First, from a theoretical perspective, Sapiro (1981) suggests that interests diverge between groups when group experience systematically differs from other groups in relation to specific issues. Sapiro argues as an example that the differential division of housework between men and women leads the two genders to have different views on such issues as education and welfare. Key to this is the idea that the experience across groups is systematically different and the within group experiences are systematically similar. It would not take any stretch of the imagination to see how African Americans have had systematically different experiences to the same events on issues such as racism, segregation, and poverty than their white peers and that these experiences would lead each group to develop similar responses to issues like civil rights, welfare, and voting rights. Mansbridge (1999) invokes the idea of uncrystallized interests to promote descriptive representation, arguing that an individual's uncrystallized interests are the result of that individual's experiences. To the extent that an identity group has systematically faced the same experiences, their uncrystallized interests will form in similar patterns.

Secondly, public opinion polls have shown that racial and gender identities have issues on which the groups diverge at high levels. For example, 84% of African Americans believe that they are treated less fairly than whites in dealing with police, while 75% believe the same thing when it comes to dealing with courts, both substantially higher rates than their white counterparts (Pew Research Center 2016). 67% of Hispanics believe that government should be larger and offer more services versus only 40% of the general public who hold the same view (Pew Research Center 2014). 70% of women agree that online harassment is a "major problem" compared to 50% of men (Pew 2017). In each of these cases, it is clear how the unique experiences of each identity contributes to the shared opinion, which can create policy interests. African Americans' experiences with the law would lead to a preference for criminal justice reform, Hispanics opinions on the size of government would lead to an expansion of services, women's experiences with harassment would lead them

to support greater workplace protections. The unique experiences lived because of the identity therefore shape the interests of the group. These statistics also illustrate the point that a uniform experience for all members of an identity group are not the same, but given the high likelihood of certain experiences for certain groups, the prevalence of groups holding unique shared interests are high.

Lastly, past studies have shown that increasing the descriptive representation of identities leads to policy outcomes directly relevant to the group (Haider-Markel 2007; Berkman and OConnor 1993; Saint-Germain 1989; Thomas 1991). The only theoretical reason that these policies would be linked to the level of representation of the relevant identity is if the representatives who share the relevant identity care about the issues at levels different from their colleagues who do not share the identities. At that point, there is a question about whether the experiences that have caused the representatives to hold those interests are different for elites than they are for the masses. Of course the experiences occur before the representatives are representatives and as such it would be hard to argue that there should be a difference. These policy outputs are consistent with the linked fate literature arguing for group consciousness (Sanchez and Vargas 2016; Simien 2005; Gay and Hochschild 2010). The theoretical linkage of experiences with interests, coupled with public opinion polls showing coalescence of identities around these interests and studies showing that increased representation of an identity produces group relevant policies at higher rates provide a sufficient basis for assuming that members of an identity share interests. Having addressed these elements and established a foundation of understandings, I turn now to an exploration of the proportional representation literature.

### **3 The Impact of Proportional Representation**

Research on proportional representation (PR), wherein groups are appointed seats in the legislature proportional to their vote share, predominantly focuses on cases outside of the United States precisely because the United States does not have proportional representation. However, this does not make this literature irrelevant to the project at hand. Instead, the literature on proportional representation provides insight into what happens when proportionality is imposed

on systems. Often, as I will discuss further below, the consequences of proportionality are caused by the methods of imposing fairly distributed representation. Instead, of incurring these problems, I argue that the United States demonstrates a case where proportional representation can be achieved voluntarily through the desire of populations to see their levels of representation increased. Proportionality is a natural equilibrium point as it indicates that no group is overrepresented or underrepresented and, if nothing else, provides a perception of fairness. While proportional representation systems primarily focus on moderating the proportions of parties relative to their vote share, the effects of proportionality should translate to social identities like race and gender, assuming that racial and gender identities do in fact have distinct preferences and interests, an assumption I have already addressed. Where I discuss findings below on the effects of proportional representation in relation to partisan identities, I also discuss the implications for racial and gender identities.

One challenge to assessing the impacts of proportional representation is the lack of a valid counterfactual. A government either employs proportional representation or they do not. Observations on effects from governments transferring from non-PR systems to PR systems suffer from a problem of endogeneity, thus inhibiting successful comparisons. Cross national comparisons attempt to address this problem, but require a careful defense of the case selection. State legislatures in the United States provide a variety of levels of proportionality, thus allowing for a study of the impact of the degree of proportionality on legislative behavior.

While the lack of sufficient counterfactuals for PR systems hinders causal testing, this has not stopped proponents from offering theoretical arguments and some empirical tests of the system's merits. Blais and Bodet (2006), using a cross-national study of 31 countries, find that proportional representation of parties has two effects in regards to policy congruence. First, it allows new parties to be represented, which reduces policy congruence because the new parties are typically more extreme. Second, it increases the likelihood that coalitions will be needed to pass legislation, which drives policies to be more congruent with the population. In the case of race and gender, the first finding is less of a concern as increasing the proportionality of race and gender in legislatures is not a matter of introducing new groups, but of improving the representation of underrepresented

groups. Thus, to the extent that the better represented groups are now more likely to be a part of the governing coalition, proportional representation by race or gender theoretically increases the likelihood that these legislators will be able to influence the governing coalitions policy.

Boston, Church, and Bale (2003) note that New Zealand's switch to a proportional representation has had the effect of slowing the legislative process down. They attribute this to the increased demands of the newly represented groups, whose interests are included in the policy process. Their findings provide additional evidence that increasing the representation of women and racial minorities in legislatures will increase their inclusion in the policy making process.

From a theoretical perspective, Amy (2002) argues that elections in the United States are unfair because they often lead to the underrepresentation of marginalized groups. To the extent that these underrepresented groups and their representatives have distinct ideologies from the overrepresented groups, the underrepresentation will drive policy to be less responsive to the marginalized groups, who by nature of their underrepresentation have a weaker voice. Thus, the benefit of proportional representation, however it may be achieved, is that the decision making body better represents the marginalized groups and, by way of the descriptive representation, produces substantive representation in the form of greater policy responsiveness. Amy summarizes this argument by declaring, "the more representative such a body is, the more likely it is to pass laws that embody the views of the public" (2002, 32). This principle, Amy notes, is consistent with the views of many of the founding fathers who believed that the legislature should reflect the population like a portrait (2002).

Amy (2002) finds similar problems with racial minorities. Detailing the damage done by the underrepresentation of these groups, he notes that "historically, all-white or predominantly white legislatures in the United States have often contributed to the oppression of racial minorities or at least paid little attention to their problems" (Amy 2002, 126). The benefits of proportional representation for racial minorities fall into two categories: better policy positions as advocated for by the racial minority representatives and a reduction in bias among the out-group members. With regards to the latter benefit, Grofman and Davidson (as cited in Amy 2002) argue "The presence of minority officeholders makes it harder for racism to persist inside a legislature" (126).

One avenue for criticism of the benefits of the increased representation of women and racial minorities stems primarily from the methods by which their proportionality has been achieved. Two common methods to achieving proportionality for underrepresented groups are quotas and majority-minority districts. Quotas can be problematic for marginalized groups because they promote adherence to their benefactors policy preferences instead of their identity groups interests (Hassim 2009). If representatives are not able to exercise their policy interests, then the link between descriptive representation and substantive representation is severed. Majority-minority districts have been criticized for diluting minority influence in surrounding districts to the point that the loss of influence in surrounding districts outweighs the gains from achieving descriptive representation (Cameron, Epstein, and O'Halloran 1996).

It is precisely for these two reasons that natural increases in the descriptive representation of women and racial minorities are preferable to institutionalized methods to achieving them. Natural increases provide the benefits of proportional representation without the costs of imposing it. This paper contributes to the proportional representation literature by empirically demonstrating that voluntary increases towards proportional descriptive representation in the United States can achieve the theoretical benefits seen in other proportional representation systems. While this section has discussed the benefits of proportional representation using cases of representation, I turn now to the literature on descriptive representation, which employs analyses using gender and racial identities.

## **4 Competing Arguments on the Benefits of Descriptive Representation**

Note that while other theories of intergroup interactions, such as contact theory, critical mass theory, racial threat theory and realistic group conflict theory, have been invoked to explain past findings, I believe that the literature has suffered from a methodological problem stemming from a conceptual problem. I therefore do not discuss these theories here, but address them in the discussion. As such, I revisit the standard conception of descriptive representation and employ a new measure of it to test the revised concept.



Within the literature on collective descriptive representation, there is a strong debate about the benefits of descriptive representation, both substantive and symbolic. Some scholars have argued that descriptive representation improves policy outcomes (Haider-Markel 2007; Hannigan and Larimer 2009; Hayward 2009; Mendelberg, Karpowitz, and Goedert 2014; Preuhs 2007), while Carnes (2013), illustrating the contrapositive, shows that the lack of descriptive representation among the working-class leads to policy outcomes that ignore their preferences. Other scholars have focused on behavior, pointing to increased participation (Clark 2013), increased deliberation of identity relevant issues in legislatures (Bratton 2005), and larger voices in those deliberations (Mendelberg, Karpowitz, and Goedert 2014). In addition to these benefits, scholars have also found attitudinal benefits, showing that increased descriptive representation produces higher levels of perceived legitimacy (Hayes and Hibbing 2016), increased perceptions of legislature responsiveness (Bowen and Clark 2014), and higher levels of efficacy (Atkeson and Carrillo 2007; Gay 2002).

Despite these findings, the argument that descriptive representation has substantive and symbolic benefits is not a universal conclusion. Swain (1995) does not find evidence for any substantive benefits to descriptive representation of African Americans. Another study found that while the descriptive representation of women improves evaluations of the legislators among women, it fails to produce any impact on trust in government, political efficacy or participation rates (Lawless 2004). Gay (2001) finds that descriptive representation of African Americans has little impact on participation rates among black citizens, while decreasing participation among whites. Kanthak and Krause (2012) argue that numerical representation is a necessary, but not sufficient condition for producing benefits as the size of the group is impacted by the effects of tokenism and coordination problems. Most troubling of all may be the finding that while increased descriptive representation of the LGBT community improves their policy outcomes, it also produces a backlash that increases the amount of anti-LGBT policies (Haider-Markel 2007).

While the literature has debated the benefits of collective descriptive representation, I believe that it suffers from a theoretical and methodological problem illustrated by the previous two examples. Collective descriptive representation is typically studied by focusing on one identity and measuring it by the percentage of representatives who share that identity. As a result of re-

search on descriptive representation primarily focusing on women and racial minorities who have been historically underrepresented, there has not been much research that has evaluated the net impact of increasing underrepresented groups' representation and simultaneously decreasing the representation of the overrepresented, which obfuscates the problems with measuring descriptive representation purely as a percentage.

Much of the previous research finds that increasing descriptive representation for a group has linear benefits for the group, but because the measures focus only on one group there is little ability to test the backlash to overrepresentation from other groups. This backlash can come in many forms, from substantive effects, such as limiting policy influence when their identity rises above a token level or increasing policies targeting the identity, to psychological effects, such as a loss of perceived efficacy among the groups that are underrepresented in order to allow for another group to be overrepresented. Collective descriptive representation is thus a zero-sum game, wherein benefits to one group necessarily take away from another group, which can spark conflict.

While both Kanthak and Krause (2014) and Haider-Markel (2007) focus on the consequences of growing minority descriptive representation, neither develops a measure to account for the descriptive representation of multiple identities of the same category within a representative body (e.g. studying how the descriptive representation of just whites affects some outcome versus studying how the balance of descriptive representation of all groups in society with a single measure - whites, African Americans, Hispanics and Asians together - and the effect of the balance between groups on some outcome). As a result, the negative consequences they may discover against growing a single identity's representation is only a piece of the puzzle in terms of the overall outcome. In the following section, I outline a theory of proportional descriptive representation that accounts for the collective descriptive representation of all identities in a representative group and illustrate the ways in which this concept should affect the group's behavior. Later, I introduce a new measure to the descriptive representation literature that is designed to produce a single score of representative proportionality. These two elements are the central contributions of this paper to the literature on descriptive representation.

## 5 A Theory of Proportional Descriptive Representation

In this section, I outline a theory of legislative behavior that links the behavior of the legislators to the degree to which the body descriptively represents the population being represented. In contrast to individual or collective descriptive representation, this paper focuses on proportional descriptive representation, which, as the name suggests, is the idea that individuals are represented by individuals who share their identities in proportion to the identity's share of the population. Proportional descriptive representation is a way to account for the balance of multiple identities simultaneously, while having a more normatively justified scale. In the collective descriptive representation literature a deliberative body is descriptively representative to the extent to which a group is present in the representation. This implies that a group could continue to receive benefits while moving towards 100% descriptive representation. On issues of relevance only to a specific group, such as women's perceptions of political efficacy, this is fine, but on issues of collective interest, such as policy responsiveness to the public, movement in the rate of women legislators produces a change in the rate of men's descriptive representation, which can also affect the outcome.

Proportionality provides a normatively fair distribution of representation at which point no group can claim to be underrepresented relative to the size of their group in society. My conception of proportional descriptive representation goes one step further than simple descriptive representation to argue that not only is an identity accounted for in the deliberative group, but the identities in the deliberative body are held in proportion to the greater population's identification. That is, a population that is 25% Asian, 25% white, 25% African American and 25% Latino is proportionally descriptively represented by a representative group that is also 25% Asian, 25% white, 25% African American and 25% Latino. Proportional descriptive representation draws on the same conception of collective descriptive representation, but accounts for the representation of more than one identity and for overrepresentation. That is to say, proportionality provides a single measure that accounts for the underrepresentation or overrepresentation of each group and compiles them to describe the extent to which the entire representative body looks like the entire population. I discuss the construction, interpretation, and implications of this measure in more

detail in the following section.

I focus on one element of descriptive representation to begin building this theory, uncrystallized interests (Mansbridge 1999). Mansbridge argues that issues exist on which individuals have not consciously formed an opinion, but that they possess uncrystallized interests that when activated form a preference. These uncrystallized interests are formed by an individual's experiences and the degree to which that experience is common to members of an identity shapes the degree to which the interests formed by the crystallization are shared by group members. That is the degree to which women have collectively experienced sexual harassment in their lives may produce uncrystallized interests, that produces a common response to the #MeToo movement, despite the fact that the movement did not exist when the experiences that shaped the interests were occurring. According to this theory, descriptive representation is the best path to guaranteeing that representatives and the population they represent share interests by increasing the likelihood of sharing uncrystallized interests. If experiences common to an identity shape the interests, then when an issue becomes salient and crystallizes the interests, the crystallized interests of the representative will match those of the descriptively represented constituency .

The implication of proportional descriptive representation is that the interests of the represented population become present in the deliberative body at the same levels that they exist in the population, whether crystallized or not. I represent this in Figures 1 and 2 below using racial identities, but the theory is initially conceptually applicable across identities. Racial identity is only used for convenience and is not indicative of the sole identity to which the theory applies. After illustrating the first half of the theory using race, I then introduce the conditions that specify which identities will follow this theory and which will not.

Before continuing further, I address one issue on legislative voting. If a group holds a majority, then one could reasonably argue that they could push through their interests without any consideration of out-group members. However, this would require the legislators to organize around this identity. Given that most legislatures organize around partisanship rather than racial or gender identities, I assume that the identities are not sorted homogeneously between the parties. As such, working on issues relevant to the salient identity contains partisan considerations as well

that forces legislators to work across the salient identity group, inhibiting a simple calculation of the median voter's interests.

Returning to the theory, consider a population composed of 10% Asians, 50% whites, 20% African Americans and 20% Latinos. Their policy preferences, accounting for both crystalized and uncrystallized interests, exist within a unidimensional policy space. In the state population, the average ideology is reflective of the ideology of all constituents. In a proportionally descriptive deliberative body, or representative group, as depicted in Figure 1, the identities of the population are proportionally represented in the body and as such, their shared preferences are also represented proportionally.

From this group composition, there are a number of avenues by which representatives can use their group interests to influence policy outcomes. First, through deliberation, a fundamental aspect of any legislative body, representatives can engage with fellow representatives, sharing their group interests, which may not have been considered without their voice. Second, the the presence of diverse representatives may have psychological effects that inhibit certain policies from taking effect (Kastellec 2013). Surely, an all-white legislature would have an easier time passing policies that discriminate against African Americans than a body that includes African Americans would. While this may stem in part from the way in which African Americans would respond to the proposals, white representatives, for fear of judgment from their black colleagues, may be uncomfortable with even proposing or supporting openly discriminatory policies before any comments are made. Thirdly, proportional representation increases the need for coalitions to form in order to govern. As discussed above, not all members of a group may share the same interests. When a group is unable to push their interests unilaterally, as is more common under proportional representation, the need to include members of different identities will force the group to compromise on aspects of the proposed policy. Finally, the previously underrepresented groups may propose policies unique to their group's interests that would not have been proposed by representatives who do not share their identity. These four pathways show potential mechanisms by which proportional descriptive representation produces overall policy outcomes that reflect input from all of the groups such that the policy preferences of the representative group matches the policy preferences of the full

population. In short, when a representative body looks like the group they are representing they will act like the group they are representing. This is a central argument of the proportional representation literature discussed earlier. However, when the representation is disproportionate, as in the extreme case in Figure 2, which depicts 100% white representatives, the policy preferences of the representative group will not look like the policy preferences of the full population.

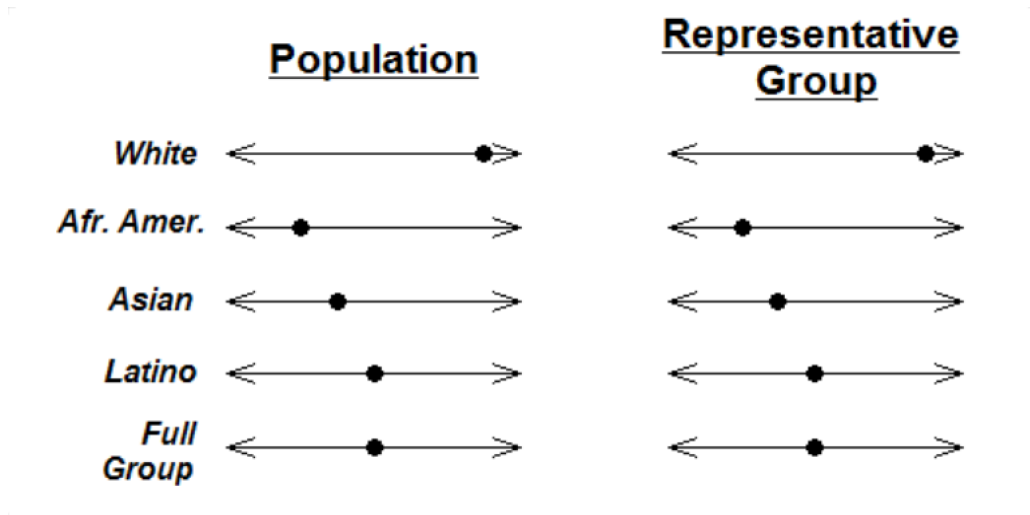


Figure 1: Fully Proportional Representation in a Unidimensional Policy Space

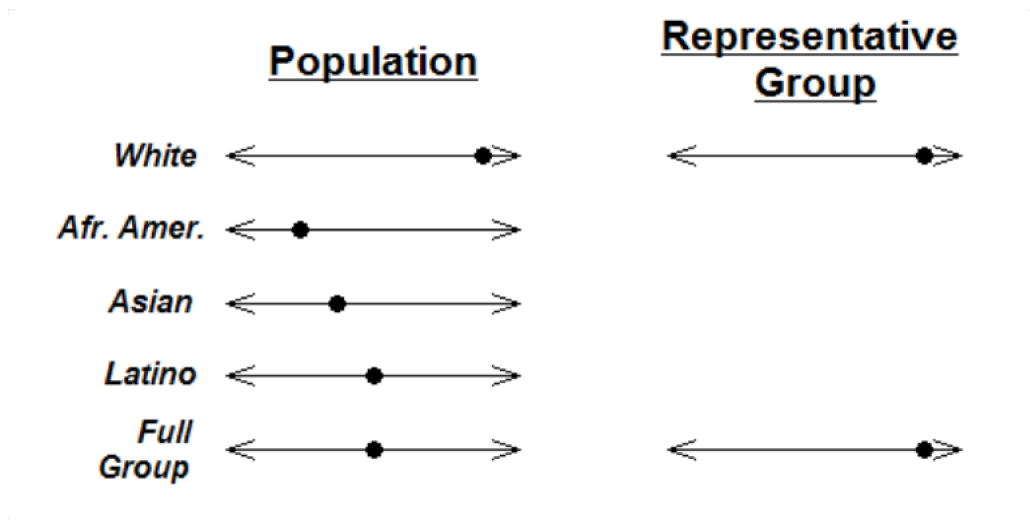


Figure 2: Fully Disproportional Representation in a Unidimensional Policy Space

While this relationship appears intuitive, it is not consistent across all identities. Driving

the relationship is the concept of tokenism. Kanthak and Krause (2012) find that as the proportion of the body consisting of minority members increases beyond a token level, colleague valuations will decrease. Thus, when the proportionality levels of the underrepresented identities are below the token threshold, the theory will work as described above. When the proportionality levels of the underrepresented identities is above the token threshold, moving to proportionality implies that the identity will be crossing the token threshold, at which point their value decreases. Even though these groups will have their interests represented at higher numerical levels, the decreased valuation of the members serves to decrease their ability to influence the policy output.

In practice, this means that tokenism mediates the effect of proportional representation based on whether the proportional level of representation for the underrepresented identities are above or below the token threshold. For racial minorities in the United States, for whom proportional representation implies a relatively low percentage of the deliberative body, they should enjoy a relatively high level of colleague valuations. This in turn should lead to the successful inclusion of their policy preferences into the deliberative body, leading to a representative group with policy preferences that match the population's preferences. As a note, throughout this paper I use the terms ideological distance, policy responsiveness and policy congruence interchangeably to refer to this concept of the alignment of policy preferences between the representative body and the represented population, with the sole distinction being that ideological distance functions as the inverse of the other two (increasing ideological distance is the same as decreasing policy responsiveness).

While tokenism facilitates the relationship between the population's policy preferences and the representative group's policy preferences for racial identities, it hinders the same relationship for women. For women to increase their share of the representatives to a proportional stake, they move beyond any valued token level into a position where their share of the representation is perceived as a threat to the majority. In so doing, the majority, feeling threatened, devalue their female colleagues and essentially exclude the women from the legislative process, producing policies not inclusive of women. The result is a body with policy preferences as if women were not present in the deliberative group, similar to the results in Figure 2, wherein the policy preferences of the representative group are substantially different from the policy preferences of the population.

Thus, the degree to which the deliberative body represents the underlying population is dependent on the degree to which the underlying population is proportionally descriptively represented, conditional on whether the underrepresented groups at proportionality are above or below a token threshold. While I do not estimate or endorse a specific threshold level, I treat racial minorities as lying below the threshold and women as residing above it. As noted initially, this theory is not conditional on any one identity group, though the identities would need to be sufficiently salient that they would produce clear policy interests. In addition to race and gender identities discussed above, religious identities should also meet these criteria.

I apply the theory outlined above in the context of state legislative chambers and state populations for racial and gender minorities. State legislatures are an ideal case to test the theory due to the variation between states. For any given year, there exists 99 different relationships between each legislative chamber and the state's population, covering states large and small, liberal and conservative, Democrat-controlled and Republican-controlled. Further, this sample allows for a comparison of cases that holds constant cultural changes in society that could impact the way minorities are included in legislative processes. Cases with only a single observation in a year that would require comparing the body to itself over time (e.g. Congress) would prove problematic for this reason.

I apply the theory outlined above to state legislatures in order to generate the testable hypotheses outlined below. For racial identities I expect to find a negative relationship between state legislative chamber proportionality and the distance between state legislative chamber ideology and state population ideology. However, for gender identity, I expect to find a positive relationship between state legislative chamber proportionality and the distance between state legislative chamber ideology and state population ideology.

*H1: For racial identities, the more proportional the representation, the lower the ideological distance between the legislative chamber and the state population.*

*H2: For gender identities, the more proportional the representation, the greater the ideological distance between the legislative chamber and the state population.*



## 6 Methodology

### 6.1 Model

I test the theory above using OLS regression with robust standard errors to estimate the model shown below. I discuss the component pieces, their justification and operationalizations in the ensuing subsections.

$$\text{Ideological Distance}_{ijt} = \alpha + \beta * \text{Proportionality}_{ijt} + \mathbf{X}\gamma + \varepsilon$$

### 6.2 Dependent Variable

I utilize in the model ideological distance as the dependent variable to express the proximity of the population’s interests to the enacted policy interests of the legislative chamber, a rough conceptual equivalent to policy responsiveness better conceived of as policy congruence. Using a dependent variable of this nature is consistent with Swain’s argument that “the extent and quality of substantive representation can be determined by examining the responsiveness of the representative to his his or her constituency” (1995, 5). Ideological distance for state  $i$ , legislative chamber  $j$ , and year  $t$  is operationalized as the absolute value of the legislative chamber’s ideology score minus the state population’s ideology. The chamber’s ideology score is taken from the Shor-McCarty (2015) Aggregate State Legislator Shor-McCarty Ideology Data, June 2015 Update data set and the state population’s ideology is taken from Berry et al.’s (1998; 2015) Updated Measures of Citizen and Government Ideology in the American States, 1960-93 data set. While some studies have employed votes on specific bills or issues, I utilize ideology scores, which are based on the legislators’ aggregate individual voting for the legislative session. This has the benefit of allowing for group based interests outside of known issue areas. It should provide a conservative estimate as it dilutes the areas where we would expect to see responsiveness. The measure runs from 0 to 4 with lower scores indicating less distance between the ideology of the population and the ideology of the legislative chamber.

### 6.3 Independent Variable

The primary independent variable of interest is the proportionality of representation for an identity category. Proportionality is measured using Gallagher’s Least Squares (GLS), which is a proportionality index originally designed to test the effectiveness of seat allocation rules in proportional representation systems (for a comparison with other measures of proportionality see Gallagher 1991). The original measure’s intent was to weigh the balance between the number of seats received and the number of votes received in a PR system. It uses the percentage of seats won by a party ( $s_i$ ) and the percentage of the vote received by the party ( $v_i$ ) to determine the proportionality of their seat assignments. The scores are aggregated for all parties in the election, with the resulting index score signifying the proportionality of the whole system. The formula for the index is below:

$$\text{Proportionality} = \sqrt{\frac{1}{2} \sum_i (v_i - s_i)^2}$$

This measure perfectly captures the concept of proportionality for group representation discussed in the theoretical section as it aggregates the overrepresentation and underrepresentation of every group within an identity category. I thus adapt it from the proportional representation literature for state  $i$ , legislative chamber  $j$ , and year  $t$ , and substitute state population share ( $p$ ) and legislative chamber seat share ( $c$ ) for each identity  $g$  for percentage of seats won and percentage of vote won, respectively. After rescaling, the result is a variable that runs from 0 to 100 so that 100 represents complete proportionality (every group is represented in the legislative chamber exactly at their size in the population) such that an increase in this score signifies an increase in the proportionality of the descriptive representation. The resulting measure is shown below.

$$\text{Proportionality}_{ijt} = 100 - \sqrt{\frac{1}{2} \sum_g (c_g - p_g)^2}$$

I present in Table 1 hypothetical distributions of identities across representatives to illustrate how the measure works. Given that representation can change substantially faster than populations, I fix the population in this example at 50% white, 30% African American, and 20% Hispanic and manipulate the identities of the representatives.

Distribution Number	Representatives			Proportionality Score	Demonstrated Effect
	White	African American	Hispanic		
1	50%	30%	20%	100	<i>Perfect Proportionality</i>
2	100%	0%	0%	56	
3	0%	100%	0%	38	<i>Majority Tyranny</i>
4	0%	0%	100%	30	
5	20%	40%	30%	77	<i>Overrepresentation of Minorities</i>
6	50%	20%	30%	90	
7	50%	40%	10%	90	<i>Equivalent Scores Regardless of Who is Misrepresented</i>
8	30%	40%	30%	83	
9	70%	20%	10%	83	

Table 1: Examination of the Proportionality Measure Adapted from GLS Using a Fixed Sample Population Distribution of 50% White, 30% African American, and 20% Hispanic

The results in Table 1 provide a number of helpful insights. Distribution 1 shows an allocation of representatives that perfectly matches the population and thus produces a top proportionality score of 100. Distributions 2 through 4 illustrate how the dominance of a single identity produces a proportionality score that shrinks with the dominantly represented identity’s proportion in the population. This stems from the fact that the measure accumulates the over or underrepresentation of each group, such that in distribution 2 there is a total misrepresentation of 100% (whites are 50% overrepresented, African Americans are 30% underrepresented and Hispanics are 20% underrepresented), while in distribution 3 there is a total misrepresentation of 140% (whites are 50% underrepresented, African Americans are 70% overrepresented and Hispanics are 20% underrepresented), and in distribution 4 there is a total misrepresentation of 160% (whites are 50% underrepresented, African Americans are 30% underrepresented and Hispanics are 80% underrepresented).

Distributions 6 and 7, and distributions 8 and 9 illustrate an important limitation of this measure, which is that it does not discriminate by source of disproportionality. In distributions 6 and 7 I alternate whether African Americans or Hispanics are overrepresented at the cost to the other. Regardless of which one is overrepresented, as long as the degree of misrepresentation is the same (10%) the resulting proportionality score will be the same. Distributions 8 and 9

also illustrate this point, but expand the misrepresentation to a third identity. If the data had variability similar to distributions 8 and 9, this could be highly problematic as the group dynamics in distribution 8 when moving to proportionality might differ in significant ways from the group dynamics in distribution 9 when moving to proportionality. However, given the data employed and that in all cases there exists a dominant group that is overrepresented, similar to distribution 9, I do not worry about this concern. Ongoing use of this measure requires a careful examination of the data to check for this concern.

## 6.4 Control Variables

In the model,  $\mathbf{X}$  is a vector of control variables that includes measures indicating the state house or senate, the partisan control of the legislative chamber and the governor's office, the professionalization of the legislative chamber, the number of seats in the legislative chamber, the total state population, the term length for a member of the legislative chamber and the turnover rate for the legislative chamber from the prior session. See Table A2 in the appendix for a full description of variable descriptions, data sources, and coding schemes.

The type of legislative chamber is an important control variable because of the different nature of each chamber. Typically, the house chamber represents fewer constituents per member thus making it easier for minorities and women to be represented. Additionally, some state senates have a filibuster or other procedural hurdles that make it harder for legislators to pass bills with a simple majority. On the one hand, the house has more possibilities for minority voices to be represented, which could cause the house to be closer ideologically to the population than the senate. Alternatively, the presence of procedural barriers in the senate could reduce the tyranny of the majority and force more voices to be included in the legislative process. I therefore control for the chamber type, but remain agnostic on the direction of influence.

Partisan control of the legislative chamber is controlled for because of the linkage between the Democratic party and women's and minority interests. Given the Democratic party's policy preference for addressing discrimination, I expect that legislative chambers controlled by Democrats will be more responsive to state populations. These partisan influences can also be exercised by the

governor to control the legislative agenda through their threat of a veto. As such, I control for the partisanship of the governor. The level of professionalization reflects a number of elements, but of primary interest are the resources available to legislators and the amount of time spent in session. Less time spent in session could force the chamber to be more collaborative in achieving their goals in a short time and thus be more responsive or it could reduce the willingness of representatives to work with different members who they have not developed relationships with. While I control for level of professionalization, I do not predict a direction for its effect.

Number of seats and total state population tap similar issues. A higher the number of seats produces more opportunities for diverse voices to be included, but also increases coordination problems. A larger state population also increases the chances for diverse voices to be included. This is evident when considering the percentage of non-white citizens in some of the most populous states, such as California (40%), New York (31%), Texas (45%) and Florida (33%,) versus the percentage of non-whites in some of the least populous states, Wyoming (8%), Vermont (2%), North Dakota (2%) and Alaska (8%). For these reasons, I control for both.

Lastly, term length and turnover rate have comparable influences on the distance between a legislative chamber and the population. As term lengths increase, legislators become shielded from the influences of public opinion and can become less responsive. Turnover rate reflects the degree of competitiveness or safety in a seat. When turnover is high, legislators should feel the threat of the vote and vote more responsively.

## **6.5 Data Sources**

In order to test the model created above, existing data needs to be gathered together combining demographic data on state populations and state legislative chambers, in addition to ideology data for both groups. To achieve this, I employ 4 distinct sources of data. I discuss these further below.

To capture legislative chamber demographics, I employ data from the National Conference of State Legislatures (NCSL). This data provides the largest constraint on the scope of the empirical tests due to two limitations. First, the data is only available for a limited number of years, for

either race or gender. I focus my analysis on 2003 because it is the only year for which complete data is available both the independent and dependent variables. The second limitation of this data is that it only provides racial demographics for Latino and black state legislators. Thus, in order to have a full accounting of the proportionality of representation, I treat the remaining legislators not identified as either African American or Latino as white. In some states, this assumption has only a trivial impact on the calculated proportionality, while it is problematic in other states that feature large Asian American and Pacific Islander or Native American populations. The states most affected by this (in order of the percentage of the state population not identifying as either white, black, or Latino) are Hawaii (67%), Alaska (25%), California (15%), Oklahoma (14%), New Mexico (11%), Washington (11%), and South Dakota (10%). All other states have less than 10% of their population that identify as non-white treated as white, implying a maximum potential error in their proportionality score of 10. While this is not ideal, it is a necessary step in order to test the hypotheses.

To capture details on state populations, I turn to the U.S. Census Bureau's State Inter-censal Tables. This data provides detailed breakdowns of state populations by race and gender for an expansive period of time, batched by decade. To maintain consistency with the measure of legislative chamber demographics, I treat the portion of the population that does not identify as African American or Latino as white. While this is problematic for a number of states, as described above, it ensures that the comparisons of legislative chambers and populations are made with the same demographic groups. This demographic data and the data from the NCSL together are used to create a measure of proportional descriptive representation, which serves as the primary variable of interest.

Finally, to form the dependent variable, ideological distance, I employ Shor-McCarty (2015) ideology scores for each legislative chamber and Berry et al. (1998; 2015) state citizen ideology scores to compute the distance between the legislative chamber's ideology and that of the state population. Additional data for the control variables come from the NCSL (chamber partisan control, gubernatorial partisanship, and legislative term lengths), the U.S. Census Bureau (2016) (total state population), Squire (2007) (legislature professionalism), and the Book of States (2003)

(legislative turnover rates). Additional details on these variables can be found in Appendix A and B.

## 6.6 Data Summary

Before turning to the results, I provide a brief snapshot of the data. Table 2 presents a summary of the gender compositions of all 50 states and their proportionality scores, broken down by legislative chamber. The average state is 50.8% women, while the average house chamber is only 23% women and the average senate chamber is only 20.5% women. Of the chambers with the highest levels of female representation, three are among the coastal states (Washington senate, Washington house and Maine senate), while two are located in liberal Heartland states (Minnesota senate and Colorado house). The five states with the highest levels of male representation are located in the Southern United States (South Carolina senate, South Carolina house, Louisiana house, Alabama house, and Alabama senate) or the Midwest United States (Ohio senate and Kentucky senate). The average proportionality score is 72.2 for house chambers and 69.8 for senate chambers (71 for the whole sample). The five least proportional chambers for gender are the South Carolina senate (52.9), the Louisiana senate (56.2), the Alabama senate (57), the Ohio Senate (57.8) and the Alabama house (58.9). The most proportional chambers are the Washington senate (90.6), the Colorado house (88.7), the Maine senate (86), the Washington house (84.5), and the Nevada senate (84.1). In all 99 state legislative chambers, women are underrepresented.

Table 3 presents a summary of the racial compositions of all 50 states and their proportionality scores, broken down by legislative chamber. With regards to the populations, the average state is 9.9% African American, 8.7% Latino, and 81.4% white. Of the five states with the highest levels of African American representation, only one (Maryland) is outside of the Southern United States. The five states with the highest levels of Latino representation are located in the Western United States. The average proportionality score is 92.7 for the house chambers and 91.8 for senate chambers (92.3 for the whole sample). The five least proportional chambers for race are the Nevada house (79.1), the Delaware senate (81.5), the Mississippi senate (82), the Delaware house (83.2) and the Texas senate (84.4). The most proportional chambers are the Vermont House (98.9), the Ver-

mont Senate (98.5), the Maine House (98.5), the Michigan senate (98.2), the New Hampshire house (98.2) and the New Mexico house (98.2). African Americans are overrepresented in 21 legislative chambers by an average of 1.8% and underrepresented in 78 chambers by an average of 3.7%, for an overall underrepresentation of 2.5%. Latinos are underrepresented in all 99 legislative chambers by an average of 5.6%. Whites are underrepresented in one chamber by 0.2% (Ohio house) and overrepresented in the remaining 98 chambers by an average of 8.2% (8.1% for all chambers).

## 7 Results

I begin by reviewing the results of the race model. If the theory of this paper is correct, the model results should return a negative coefficient on the measure for proportionality of representation, indicating that as a legislative chamber becomes more proportionally representative along racial identities the ideological distance between the chamber and the population will shrink. Looking at the results in Table 4, the null hypothesis fails to be rejected. As the regression table indicates, the coefficient on the variable of interest, racial proportionality, is statistically significant with  $p < 0.01$ . Additionally, as the variable for this coefficient runs from 0 to 100, moving from a chamber at the minimum to the maximum produces a substantive effect of 2.5 in the dependent variable, more than half of the variable's range of 4.

Looking at the other components of the model, only two achieve any statistical significance. The number of seats in the legislature is highly significant, with  $p < 0.01$  and a coefficient which can produce a substantive decline of 0.38 in the dependent variable when moving from chambers at the the minimum value of the variable to the maximum. The type of chamber is also weakly significant with  $p < 0.1$ , indicating that the house chambers are more ideologically distant from the population than senate chambers. The remaining control variables fail to reach statistical significance. While the limited number of observations likely inflates the standard errors hindering some of the controls, there is little concern that this has significant influence over the primary results. I discuss the interpretation of these results further in the next section.

I turn now to reviewing the gender model. While the argument of this paper dictates that racially proportional representation should reduce the ideological distance between legislative



Table 2: Gender Demographics by State- Identities Shown as Percentage of Group, Proportionality Runs from 0 to 100

	State		House			Senate		
	Male	Female	Female	Male	Proportionality	Female	Male	Proportionality
Alabama	48.4	51.6	10.5	89.5	58.9	8.6	91.4	57.0
Alaska	51.7	48.3	20.0	80.0	71.7	20.0	80.0	71.7
Arizona	49.8	50.2	26.7	73.3	76.5	26.7	73.3	76.5
Arkansas	48.9	51.1	15.0	85.0	63.9	20.0	80.0	68.9
California	49.8	50.2	31.3	68.8	81.0	27.5	72.5	77.3
Colorado	50.2	49.8	38.5	61.5	88.7	25.7	74.3	76.0
Connecticut	48.5	51.5	31.1	68.9	79.7	22.2	77.8	70.7
Delaware	48.6	51.4	26.8	73.2	75.4	33.3	66.7	81.9
Florida	48.9	51.1	22.5	77.5	71.4	25.0	75.0	73.9
Georgia	49.0	51.0	21.1	78.9	70.1	23.2	76.8	72.2
Hawaii	50.1	49.9	25.5	74.5	75.6	32.0	68.0	82.1
Idaho	50.1	49.9	32.9	67.1	83.0	11.4	88.6	61.6
Illinois	49.0	51.0	31.4	68.6	80.4	16.9	83.1	66.0
Indiana	49.1	50.9	14.0	86.0	63.1	24.0	76.0	73.1
Iowa	49.2	50.8	25.0	75.0	74.2	14.0	86.0	63.2
Kansas	49.4	50.6	28.0	72.0	77.4	27.5	72.5	76.9
Kentucky	48.9	51.1	11.0	89.0	59.9	10.5	89.5	59.5
Louisiana	48.5	51.5	18.1	81.9	66.6	7.7	92.3	56.2
Maine	48.8	51.2	24.5	75.5	73.3	37.1	62.9	86.0
Maryland	48.3	51.7	33.3	66.7	81.6	31.9	68.1	80.2
Massachusetts	48.3	51.7	25.0	75.0	73.3	30.0	70.0	78.3
Michigan	49.1	50.9	20.9	79.1	70.0	28.9	71.1	78.1
Minnesota	49.6	50.4	23.1	76.9	72.7	34.3	65.7	83.9
Mississippi	48.4	51.6	13.1	86.9	61.5	13.5	86.5	61.9
Missouri	48.7	51.3	22.1	77.9	70.8	20.6	79.4	69.3
Montana	50.0	50.0	29.0	71.0	79.0	16.0	84.0	66.0
Nebraska	49.4	50.6	-	-	-	18.4	81.6	67.8
Nevada	50.7	49.3	26.2	73.8	76.9	33.3	66.7	84.1
New Hampshire	49.3	50.7	28.5	71.5	77.8	16.7	83.3	66.0
New Jersey	48.6	51.4	17.5	82.5	66.1	12.5	87.5	61.1
New Mexico	49.3	50.7	32.9	67.1	82.1	26.2	73.8	75.5
New York	48.3	51.7	24.0	76.0	72.3	17.7	82.3	66.0
North Carolina	48.8	51.2	23.3	76.7	72.1	12.0	88.0	60.8
North Dakota	50.1	49.9	17.0	83.0	67.1	10.6	89.4	60.7
Ohio	48.7	51.3	23.2	76.8	71.9	9.1	90.9	57.8
Oklahoma	49.3	50.7	10.9	89.1	60.2	12.5	87.5	61.8
Oregon	49.6	50.4	33.3	66.7	82.9	26.7	73.3	76.2
Pennsylvania	48.5	51.5	13.3	86.7	61.8	16.0	84.0	64.5
Rhode Island	48.1	51.9	17.3	82.7	65.5	23.7	76.3	71.8
South Carolina	48.6	51.4	11.3	88.7	59.9	4.3	95.7	52.9
South Dakota	49.8	50.2	17.1	82.9	66.9	11.4	88.6	61.2
Tennessee	48.7	51.3	18.2	81.8	66.9	15.2	84.8	63.8
Texas	49.6	50.4	21.3	78.7	71.0	12.9	87.1	62.5
Utah	50.2	49.8	24.0	76.0	74.2	17.2	82.8	67.4
Vermont	49.1	50.9	30.0	70.0	79.1	26.7	73.3	75.8
Virginia	49.0	51.0	15.0	85.0	64.0	17.5	82.5	66.5
Washington	49.8	50.2	34.7	65.3	84.5	40.8	59.2	90.6
West Virginia	48.9	51.1	20.0	80.0	68.9	14.7	85.3	63.6
Wisconsin	49.5	50.5	27.3	72.7	76.8	24.2	75.8	73.7
Wyoming	50.5	49.5	18.3	81.7	68.8	16.7	83.3	67.2

Table 3: Gender Demographics by State- Identities Shown as Percentage of Group, Proportionality Runs from 0 to 100

	Population			House				Senate			
	<i>Black</i>	<i>Latino</i>	<i>White</i>	<i>Black</i>	<i>Latino</i>	<i>White</i>	<i>Prop.</i>	<i>Black</i>	<i>Latino</i>	<i>White</i>	<i>Prop.</i>
Alabama	26.0	2.3	71.7	25.7	0.0	74.3	97.6	22.9	0.0	77.1	95.3
Alaska	3.4	4.8	91.8	0.0	0.0	100.0	92.9	5.0	0.0	95.0	95.7
Arizona	3.1	26.9	70.0	1.7	15.0	83.3	87.3	0.0	16.7	83.3	87.9
Arkansas	15.6	4.2	80.2	12.0	0.0	88.0	93.2	8.6	0.0	91.4	90.2
California	6.3	34.1	59.6	5.0	22.5	72.5	87.7	5.0	22.5	72.5	87.7
Colorado	3.7	18.6	77.7	3.1	12.3	84.6	93.4	5.7	5.7	88.6	88.0
Connecticut	9.1	10.6	80.3	6.6	3.3	90.1	91.2	8.3	0.0	91.7	89.0
Delaware	19.7	5.8	74.5	4.9	2.4	92.7	83.2	4.8	0.0	95.2	81.5
Florida	14.8	18.6	66.6	13.3	9.2	77.5	89.8	17.5	7.5	75.0	90.0
Georgia	29.0	6.5	64.5	21.7	1.1	77.2	89.0	17.9	1.8	80.4	85.9
Hawaii	1.9	7.8	90.3	2.0	0.0	98.0	92.2	0.0	0.0	100.0	91.1
Idaho	0.5	8.9	90.7	0.0	1.4	98.6	92.3	0.0	0.0	100.0	90.9
Illinois	14.8	13.6	71.6	16.1	5.9	78.0	92.9	15.3	5.1	79.7	91.7
Indiana	8.6	4.3	87.1	7.0	1.0	92.0	95.7	8.0	0.0	92.0	95.4
Iowa	2.3	3.5	94.2	3.0	0.0	97.0	96.8	0.0	0.0	100.0	95.0
Kansas	5.7	8.1	86.3	4.0	1.6	94.4	92.5	5.0	2.5	92.5	94.1
Kentucky	7.4	1.9	90.6	5.0	0.0	95.0	96.2	2.6	0.0	97.4	94.0
Louisiana	32.5	2.9	64.6	21.0	0.0	79.0	86.7	23.1	0.0	76.9	88.8
Maine	0.8	1.0	98.3	0.0	0.0	100.0	98.5	0.0	0.0	100.0	98.5
Maryland	28.4	5.4	66.2	22.7	2.1	75.2	92.2	21.3	2.1	76.6	90.8
Massachusetts	5.8	7.6	86.6	3.1	1.9	95.0	92.6	2.5	2.5	95.0	92.7
Michigan	14.2	3.7	82.2	13.6	0.0	86.4	96.0	13.2	2.6	84.2	98.2
Minnesota	4.1	3.6	92.4	1.5	0.7	97.8	95.3	0.0	0.0	100.0	93.4
Mississippi	36.2	1.8	62.0	28.7	0.0	71.3	91.4	19.2	0.0	80.8	82.0
Missouri	11.4	2.6	86.1	8.6	0.0	91.4	95.4	8.8	0.0	91.2	95.6
Montana	0.4	2.4	97.3	0.0	0.0	100.0	97.4	0.0	0.0	100.0	97.4
Nebraska	4.1	6.8	89.0	-	-	-	-	2.0	2.0	95.9	93.9
Nevada	7.0	22.0	71.0	9.5	0.0	90.5	79.1	14.3	4.8	81.0	85.0
New Hampshire	0.8	2.1	97.0	1.0	0.3	98.8	98.2	0.0	0.0	100.0	97.4
New Jersey	13.2	14.7	72.1	12.5	8.8	78.8	93.7	15.0	0.0	85.0	86.1
New Mexico	1.7	43.5	54.7	2.9	41.4	55.7	98.2	0.0	35.7	64.3	91.2
New York	15.0	15.9	69.0	14.0	6.7	79.3	90.2	14.5	8.1	77.4	91.9
North Carolina	21.4	5.9	72.7	15.0	0.8	84.2	90.0	12.0	2.0	86.0	88.1
North Dakota	0.8	1.5	97.7	0.0	0.0	100.0	98.0	0.0	0.0	100.0	98.0
Ohio	11.7	2.3	86.0	14.1	0.0	85.9	97.6	12.1	0.0	87.9	97.9
Oklahoma	7.4	6.4	86.2	3.0	0.0	97.0	90.6	4.2	0.0	95.8	91.5
Oregon	1.6	9.3	89.1	0.0	1.7	98.3	91.5	10.0	0.0	90.0	91.1
Pennsylvania	10.1	3.9	86.1	7.4	0.5	92.1	94.7	6.0	0.0	94.0	93.1
Rhode Island	4.8	10.0	85.2	5.3	1.3	93.3	91.6	0.0	2.6	97.4	89.4
South Carolina	29.0	3.2	67.8	19.4	0.0	80.6	88.4	17.4	0.0	82.6	86.5
South Dakota	0.8	2.0	97.2	0.0	0.0	100.0	97.5	0.0	0.0	100.0	97.5
Tennessee	16.6	2.9	80.6	15.2	0.0	84.8	96.2	9.1	0.0	90.9	90.8
Texas	11.4	34.0	54.6	8.7	20.0	71.3	84.4	6.5	22.6	71.0	85.5
Utah	0.8	10.3	88.9	1.3	0.0	98.7	90.0	3.4	0.0	96.6	90.7
Vermont	0.6	1.1	98.2	0.7	0.0	99.3	98.9	0.0	0.0	100.0	98.5
Virginia	19.4	5.7	74.9	10.0	0.0	90.0	86.8	12.5	0.0	87.5	89.1
Washington	3.3	8.6	88.1	2.0	0.0	98.0	90.7	2.0	2.0	95.9	92.7
West Virginia	3.2	0.8	96.0	0.0	0.0	100.0	96.3	0.0	0.0	100.0	96.3
Wisconsin	5.8	4.3	89.8	6.1	1.0	92.9	96.8	6.1	0.0	93.9	95.8
Wyoming	0.8	7.0	92.2	0.0	1.7	98.3	94.2	0.0	0.0	100.0	92.6

	(1) Coefficient
Racial Proportionality	0.025*** (0.007)
House	0.142* (0.073)
Democratic Controlled Chamber	-0.006 (0.046)
Democratic Governor	-0.072 (0.046)
Legislature Professionalization Score	0.001 (0.003)
Seats in Legislative Chamber	-0.001*** (0.000)
State Population (Millions)	0.011 (0.007)
Term Length	-0.008 (0.032)
Chamber Turnover	-0.003 (0.002)
Constant	-1.835*** (0.608)
Observations	99
$R^2$	0.2310
$\hat{\sigma}$	0.234
F-Statistic	4.026
Prob > $F$	0.000

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 4: The Effect of Representative Proportionality on Ideological Distance for Racial Identities

chambers and the state population, I argue that, because proportional gender representation rises above a token level, increasing the proportionality of gender representation should increase the ideological distance between the state population and the legislature. Looking at the results of the gender model, displayed in Table 5, I find that the hypothesis is not supported. As in the Race Model, the coefficient on proportionality does reach statistical significance, with  $p < 0.05$ . The

	(1) Coefficient
Gender Proportionality	-0.006** (0.003)
House	0.129 (0.078)
Democratic Controlled Chamber	-0.025 (0.050)
Democratic Governor	-0.057 (0.049)
Legislature Professionalization Score	0.005 (0.003)
Seats in Legislative Chamber	-0.001 (0.000)
State Population (Millions)	0.001 (0.007)
Term Length	-0.008 (0.034)
Chamber Turnover	-0.001 (0.002)
Constant	0.833*** (0.237)
Observations	99
$R^2$	0.1189
$\hat{\sigma}$	0.251
F-Statistic	1.771
Prob > $F$	0.085

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 5: The Effect of Representative Proportionality on Ideological Distance for Gender Identities

magnitude of the effect is substantially smaller, by a factor of 4, for gender than it is for race. However, while the theory predicted a positive coefficient, the finding is a negative coefficient. This is consistent with the core theoretical argument of this paper that increased proportional descriptive representation decreases ideological distance between the representative body and the represented population, but is inconsistent with the theoretical argument that tokenism impacts

the way proportional descriptive representation works at proportionality. All of the covariates in the gender model fail to reach statistical significance. I discuss the implications of the findings from both models in the next section.

## 8 Discussion

The results in the previous section contradict the theory of this paper, with both models finding statistically significant effects from proportionality, but in the opposite directions theorized. I begin this section by discussing the implications of the results. I then show additional models which employ standard descriptive representation measures to illustrate the effects of the proportionality measure. I then move to discuss three alternative explanations of the results before briefly touching on the limitations of this paper and concluding.

### 8.1 Implications

The results of the model provide different implications for race and gender. To see the impact of full proportionality, I look to the model's predicted ideological distance of each legislative chamber when at full proportionality, holding the remaining variables constant at their real values. Using the coefficients from the regression table, I find that, under the Race Model, 77 of the 99 legislative chambers in my sample would have a higher predicted ideological distance under the model at full proportionality than they actually do in 2003. Under the Gender Model, 73 of 99 legislative chambers would be predicted to be ideologically closer to their state population.

The normative implications of these results suggests that having proportional representation of social identities is not always beneficial. Legislative chambers with more proportional representation of race will become more ideologically distant, suggesting that legislatures with less racially representative chambers are more responsive to their constituents, defying normative democratic theory. However, the reverse is true for gender. Legislative chambers that are more representative of gender are more responsive. Both cases demonstrate that the level of proportional descriptive representation has an effect on the representation of substantive interests, but I find that the direction of the effect is conditional on the identity.

These findings have important implications for historically underrepresented groups. Women and racial minorities are running for office in record numbers in an effort to challenge what they view to be poor representation (Hernández 2017). While their election campaigns are theoretically beneficial, the literature has been ambiguous in its prediction of the impact of their presence in the legislature. Their presence in the legislature could produce negative consequences, undermining their effort to improve the representation of these groups. The findings in this paper suggest that increasing the share of women in legislatures may be beneficial, but increasing the share of racial minorities may not be.

A third implication of the findings presented in this paper deals with the effects of tokenism on overall group dynamics. Kanthak and Krause’s (2012) Unified Theory of Colleague Valuations looks at the marginal utility a member of Congress derives from increasing the size of a minority group and how this translates into colleague valuations. They argue that “greater numbers do not necessarily translate into greater esteem for members of a minority group within a legislature” (Kanthak and Krause 2012, 160). However, their approach equates esteem and valuation with influence, a notion the results of this study reject conditionally. Their findings rely on empirical work showing the relationship of valuation on formal institutional roles, but ignores (likely due to the complexity of observing informal influence) the way legislators can influence the legislature through informal channels. Contradicting their work, I find that legislative chambers with higher levels of women’s numerical representation approaching proportionality are in fact closer, ideologically, to their constituents, suggesting that increasing women’s proportional descriptive representation can influence the legislative process. The failure of the Gender Model to behave consistently with the tokenism literature suggests that while tokenism has some impact on internal group dynamics, it is less effective at hindering overall influence.

## **8.2 Descriptive Representation versus Proportional Descriptive Representation**

A key motivation of this paper was to address the inability of traditional descriptive representation measures to provide a comprehensive examination of how changing dynamics of the whole group affected an outcome. As such, this paper employs a measure of proportionality to evaluate

changing group dynamics holistically and in such a way that it could reasonably produce changes in the group's behavior. To illustrate this point, I present in Tables 6 and 7 comparisons between the model of this paper using the proportionality measure employed above and standard measures of descriptive representation typically found in the literature.

Table 6 presents the comparison of measures for the gender models. Model 6.1 is identical to the model in Table 5, which employs the proportionality measure described above, and is reproduced here for the convenience of comparison, while Model 6.2 replaces it with a standard measure of descriptive representation, the percentage of the identity in the group, for men, and Model 6.3 employs the descriptive representation measure for women. Because gender is split between two categories, male and female, the percentage of men in the legislature is inversely proportional to the percentage of women, which causes Models 6.1 and 6.2 to produce the same coefficient with a reversal of the sign. While the proportionality measure does not necessarily help simplify the interpretation of multiple identity groups for gender, it does provide one key benefit with regards to equilibrium. Models 6.2 and 6.3 suggest that legislative chambers with 100% female representation will have the lowest ideological distance between the chamber and the population. This level of representation is neither practical<sup>1</sup> nor normatively just. Given that the data does not contain observations for women's overrepresentation, it is just as possible that the "missing" observations would fracture these results. The proportionality measure provides a model that conceptually accounts for the effects of overrepresentation with the variable's value peaking at proportionality and then declining as overrepresentation increases.

Table 7 provides similar models for race. Model 7.1 presents the model from Table 4 for comparison, Models 7.2 through 7.4 employ the standard descriptive representation measures for African Americans, Latinos, and whites, respectively. Model 7.5 combines models 7.2 and 7.3, using white descriptive representation as the baseline, as a possible alternative pathway to a holistic approach. Models 7.2 through 7.4 tell a story consistent with the descriptive representation literature, that legislative chambers with higher levels of minority descriptive representation, or lower levels of white representation, have smaller ideological distances between the chamber and the population.

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<sup>1</sup>I consider the lengthy period of history when representation in the United States was 100% male a relic of history not to be revived.

	(1) Proportionality	(2) Male DR	(3) Female DR
Gender Proportionality	-0.006** (0.003)		
Percent Male Legislators		0.007** (0.003)	
Percent Female Legislators			-0.007** (0.003)
House	0.129 (0.078)	0.126 (0.078)	0.126 (0.078)
Democratic Controlled Chamber	-0.025 (0.050)	-0.022 (0.050)	-0.022 (0.050)
Democratic Governor	-0.057 (0.049)	-0.056 (0.049)	-0.056 (0.049)
Legislature Professionalization Score	0.005 (0.003)	0.005 (0.003)	0.005 (0.003)
Seats in Legislative Chamber	-0.001 (0.000)	-0.001 (0.000)	-0.001 (0.000)
State Population (Millions)	0.001 (0.007)	0.001 (0.007)	0.001 (0.007)
Term Length	-0.008 (0.034)	-0.009 (0.034)	-0.009 (0.034)
Chamber Turnover	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
Constant	0.833*** (0.237)	-0.118 (0.314)	0.534*** (0.165)
Observations	99	99	99
$R^2$	0.1189	0.1212	0.1212
$\hat{\sigma}$	0.251	0.250	0.250
F-Statistic	1.771	1.735	1.735
Prob > $F$	0.085	0.093	0.093

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 6: Comparison of Gender Models Testing the Effect of Representation on Ideological Distance using Proportionality and Descriptive Representation Measures

These models contain two problems. First, they measure only one identity and, as a result, they cannot account for how other identities are balanced. Secondly, they are linear in their effects, sug-



	(1)	(2)	(3)	(4)	(5)
	Proportionality	Black DR	Latino DR	White DR	Additive DR
Racial Proportionality	0.025*** (0.007)				
Percent Black Legislators		-0.009** (0.004)			-0.011** (0.004)
Percent Latino Legislators			-0.003* (0.002)		-0.006*** (0.002)
Percent White Legislators				0.008*** (0.003)	
House	0.142* (0.073)	0.152* (0.081)	0.121 (0.079)	0.160** (0.077)	0.166** (0.079)
Democratic Controlled Chamber	-0.006 (0.046)	0.002 (0.048)	-0.025 (0.051)	0.007 (0.049)	0.013 (0.049)
Democratic Governor	-0.072 (0.046)	-0.072 (0.049)	-0.053 (0.049)	-0.063 (0.048)	-0.069 (0.049)
Legislature Professionalization Score	0.001 (0.003)	0.002 (0.004)	0.003 (0.004)	0.001 (0.004)	0.001 (0.004)
Seats in Legislative Chamber	-0.001*** (0.000)	-0.001 (0.001)	-0.001* (0.000)	-0.001* (0.001)	-0.001 (0.001)
State Population (Millions)	0.011 (0.007)	0.008 (0.006)	0.005 (0.007)	0.013* (0.007)	0.013* (0.007)
Term Length	-0.008 (0.032)	0.021 (0.035)	-0.009 (0.036)	0.012 (0.034)	0.020 (0.034)
Chamber Turnover	-0.003 (0.002)	-0.002 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.002 (0.002)
Constant	-1.835*** (0.608)	0.392** (0.168)	0.447*** (0.168)	-0.404 (0.301)	0.416** (0.167)
Observations	99	99	99	99	99
$R^2$	0.2310	0.1321	0.0920	0.1459	0.1531
$\hat{\sigma}$	0.234	0.249	0.255	0.247	0.247
F-Statistic	4.026	1.570	1.676	1.844	2.042
Prob > F	0.000	0.137	0.107	0.071	0.038

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 7: Comparison of Racial Models Testing the Effect of Representation on Ideological Distance using Proportionality and Descriptive Representation Measures

gesting that bodies with 100% African American representation (Model 7.2) will have the lowest levels of representation, but also that legislatures with 100% Latino representation (Model 7.3) will have the lowest levels of representation. Each model necessarily implies an equilibrium point where the non-measured groups are represented at 0%. These models make it difficult to assert an ideal point of representation for the different identities.

Model 7.5 attempts to resolve this problem by measuring the descriptive representation levels of all identities within a category, omitting white representation to serve as the baseline as the level of the included variables perfectly predicts the levels of white representation. This model additionally suffers from the same problem as the other models in that it indicates that chambers with 100% African American representation will have the lowest ideological distance. The linked nature of the concepts, the idea that representation is zero-sum, prohibits an analysis from truly being able to hold everything else constant. Increasing the representation of one group necessitates changing the representation of another.

Models 7.2 through 7.5 additionally suggest that chambers with the lowest ideological distance will be those dominated by a single identity group. While this is not feasible,<sup>2</sup> it also does not make normative sense. Model 7.1 provides two benefits over these models. First, it utilizes proportionality as a normative endpoint for the representation and thus accounts for the consequences of overrepresentation. Second, it compensates for the necessary loss of representation that occurs in one identity when another identity gains representation. That Models 7.2 through 7.5 all report statistically significant effects from the independent variable illustrates the need for these corrections.

### 8.3 Alternative Explanations

The theory outlined earlier in this paper argued that the more proportionally representative of descriptive identities a body is, the lower the ideological distance will be between the body and the population, conditional on whether the share of underrepresented identities, at proportionality, will be above or below a token threshold. The results section of this paper suggested that the available data does not support this interpretation. I offer three alternative explanations below that outline what may be happening.

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<sup>2</sup>Again, treating history as *history*

### 8.3.1 *Insufficient Data Variation*

Figures 3 and 4 plot the relationship between proportionality and ideological distance for race and gender, respectively. Looking at these two figures, what becomes immediately clear is the uneven distribution of the racial proportionality observations. Figure 5 rescales the data from Figure 3 to a scale comparable with Figure 4. The rescaled data illustrates just how skewed the racial observations are. The proportionality measure for race has ranges from 79.1 to 98.5, while for gender it runs from 52.9 to 90.6, almost twice as wide. To complicate the distribution further, 73% of the chambers have a racial proportionality score above 90, limiting even further the variation in observations. Figures A2 and A3 in Appendix A further show the distinction between the distribution of gender proportionality observations and racial proportionality observations. From these figures, one possible explanation for the results is that the core theoretical argument outlined at the beginning of this paper was predominantly accurate, with the exception of the impact of tokenism. Instead, proportionality counters the concept of tokenism, as evidenced by the results of the gender model. In this interpretation, the failure to find consistent results in the race models stems from a lack of variation in observations within the data set. Given that the data exists for only one year, which may or may not be representative of larger trends in proportionality, and that the levels of racial proportionality are surprisingly high, this explanation has the potential for merit. Expanding the number of observation to include additional years, especially targeting periods of lower proportionality (greater underrepresentation), will allow for a test of this explanation.

### 8.3.2 *Realistic Group Conflict and Racial Threat*

A second possible explanation of the results focuses on racial proportionality. The theory of this paper argued that because proportionality for minority racial groups exists below a token threshold, minority representation at higher levels of proportionality will be positively received in the legislative process with their interests incorporated into the policy output. However, in order for underrepresented groups to gain representation they must necessarily take representation away from another group. The proportionality measure is indifferent from whom the gains come, but the groups who are losing representation may not be ambivalent towards this. Given that the

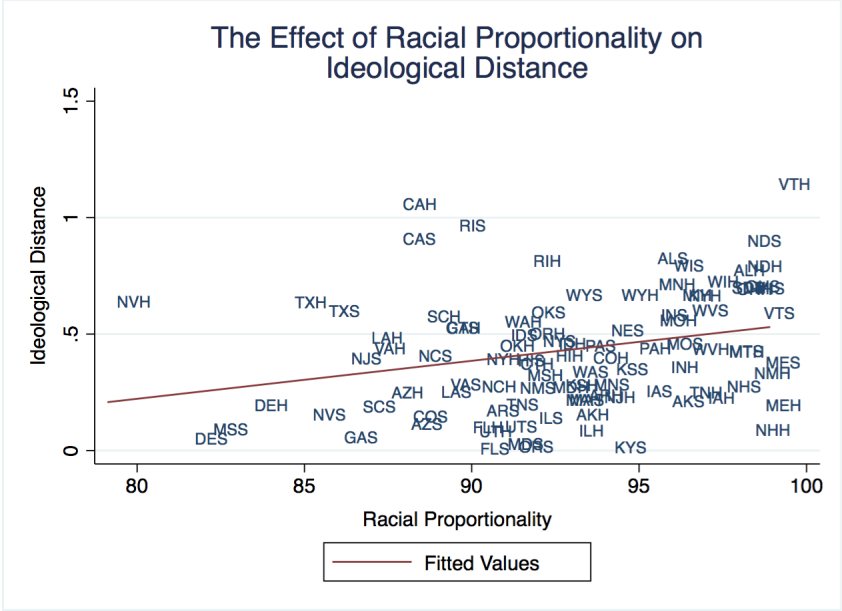


Figure 3: Plot of Racial Proportionality and Ideological Distance with Fitted Line

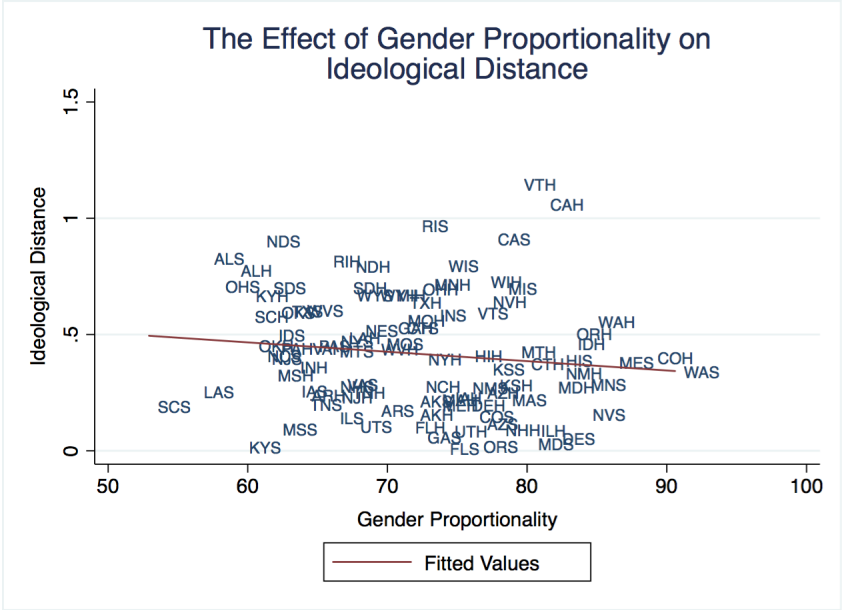


Figure 4: Plot of Gender Proportionality and Ideological Distance with Fitted Line

preponderance of overrepresentation occurs in white representation and the minority groups are underrepresented, gains in representation for the minority groups are most likely to come from white losses. To this extent, increasing racial proportionality invokes realistic group conflict associated

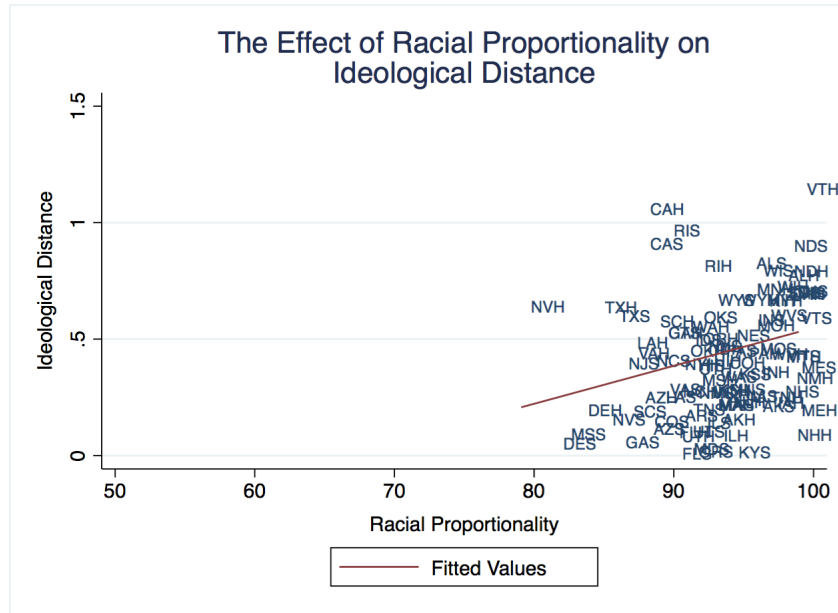


Figure 5: Rescaled Plot of Racial Proportionality and Ideological Distance with Fitted Line

with racial threat theory, which causes prejudice to form against the threatening group (Bobo 1983; Brief, Umphress, Dietz, Burrows, Butz, and Scholten 2005; Zárate, Garcia, Garza, and Hitlan 2004; Stephan, Ybarra, Martínez, Schwarzwald, and Tur-Kaspa 1998; Avery and Fine 2012; Fine and Avery 2014). In this way, decreasing white representation to increase a highly salient minority representation produces conflict that not only prevents minority interests from being represented, but decreases their representation. The results of the racial proportionality model fit well with this explanation, however, they do little to support the results of the gender model. It is possible that gender proportionality is governed by a third explanation.

### 8.3.3 Critical Mass Theory

A final possible explanation of the results focuses on the extent to which the underrepresented can still gain power. Critical Mass Theory argues that attaining a group size at or above some “critical mass” level enables minority groups to have sufficient power to affect outcomes (Childs and Krook 2008; Kanthak and Krause 2012; Bratton 2012). While the exact level of representation at which critical mass is reached is uncertain, estimates have placed it around 30% (Kanthak and

Krause 2012). The fuzzy nature of this threshold provides the opportunity for it to be a gradual increase in influence rather than an abrupt change. Within the sample, 18 of the 99 legislative chambers have proportions of women representatives above the critical mass. An additional 19 chambers have levels of representation between 25% and 30%. Given that proportionality for women is well above the critical mass threshold, it is conceivable that the results from the data analysis in this paper are documenting the effects of critical mass theory. Higher levels of proportionality in gender representation necessarily move women's share of the representation above the critical mass threshold.

The argument for critical mass theory complements the previous alternative explanation on realistic group conflict. While racial groups hardly come close to the critical mass point, and need not approach it to reach proportionality, realistic group conflict becomes the governing process for racial proportionality's influence on ideological distance. As women's representation often approaches and exceeds the critical mass level in practice, and needs to cross it to reach proportionality, critical mass theory not only explains the results of the gender model, but also articulates why the gender and race models behave differently. The three explanations outlined above provide alternative explanations to the theory of this paper and provide plausible rationales for the behavior of the data in this paper's results. The explanations are by no means conclusive, but are theoretical arguments that merit further testing.

## 8.4 Limitations

While I have attempted to thoroughly investigate the motivating question of this paper with theoretical arguments, the available data, and alternative explanations, this paper is not without limitations. First, the model ignores the role of parties in structuring legislative behavior. Parties are important for understanding how legislators may vote against their own policy preferences, and, by extension, the policy preferences of the population being descriptively represented. The model assumes sincere voting, an assumption that is certainly tenuous. Further, it ignores representational differences between the parties. The Democratic and Republican Parties certainly differ in terms of their representativeness, and it is reasonable to believe that the policy preferences of minorities

can be conflated with the policy preferences of Democrats, mitigating the extent to which minority preferences can influence the policy process independent of partisanship.

This ties in to an important second limitation, the focus on a single identity category in any analysis ignores the intersectionality of identity. Are the policy preferences of white women different than white men? Looking only at race would imply no, while looking only at gender would suggest yes. Identities interact with each other, but it is unclear what combinations of identities are salient enough to be relevant for the purposes of representation. Would the results hold if instead of looking at the proportionality of either race or gender, I analyzed race and gender combined? While data limitations prevented the exploration of this question in the present project, future efforts can focus on how intersectionality factors into the effect of proportional descriptive representation and legislature behavior.

Following on this limitation, the availability of legislator demographic data served as one of the defining constraints of this project. The research in this paper could benefit substantially from the expansion of the data to more identities and more years than currently available. As mentioned in the results section and the subsection above on alternative explanations, additional observations across years would allow for greater power in the analysis. While state legislative chambers provide the best case to test the theory of this paper due to the potential for an abundance of variation, they also pose a challenge in the availability of data. This task is not insurmountable and a coordinated effort to construct a larger data set would be critically valuable to researchers seeking to further study the impact of proportional descriptive representation.

## 9 Conclusion

This paper began by identifying a weakness in the existing literature on the benefits of descriptive representation. Prior research had focused on only one identity at a time in their analyses, such that findings could speak to only a piece of the puzzle. Research could say how African Americans, whites, and Latinos are impacted by an increase in African American descriptive representation, but in the zero-sum game of representation, the research does not account for the effects of the resulting decrease in one of the other identity's descriptive representation and how

both changes will produce some overall impact on the constituency. While it is important to know how a deliberative group will respond to increased descriptive representation, only focusing on one group at a time obfuscates the full impact.

To identify how multiple identities should be balanced, I invoked the literature on proportional representation, which advocated for proportionality as both a normative equilibrium point for multiple identities and as a distribution with positive implications for substantive representation. Applying the findings of the proportional representation literature to the descriptive representation literature, I developed a theory of proportional descriptive representation that reflects the idea that the more a representative body looks like the population they represent, the more they will act like them. Consistent with the earlier findings on proportionality and tokenism, I conditioned this theory on the premise that groups whose proportional share of the population rises above a token threshold will suffer consequences from intergroup relations causing them to be excluded from influencing policy outcomes.

I then tested the theory using a new measure of racial and gender identities in state legislative chambers that allowed for a holistic approach to descriptive representation. The findings failed to find support for the influence of tokenism as a mediating factor, rendering the expectations for gender proportionality inaccurate. Additionally, the expectations for racial proportionality performed in the opposite direction of the prediction. Both findings occurred with statistical significance. While this study was not without limitations, the normative implications are mixed, suggesting that gender proportionality is beneficial to the representation of substantive interests, while racial proportionality is harmful to it.

I have advanced the literature on descriptive representation by illustrating how prior research failed to account for all of the consequences of changing descriptive representation. Adapting prior work on proportional representation, I have provided a new measure to the descriptive representation literature that allows for the full impact of changing group representation to be documented. While there is still additional work needed to better understand the theoretical explanations of the relationships uncovered, this paper provides mixed results to the debate on the substantive effects of descriptive representation.



## Appendix Table of Contents

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## Appendix A - Summary Statistics

This section provides summary statistics and graphs for the primary variables of interest. Table A1 below provides the number of observations, minimum value, median value, maximum value, mean and standard deviation for all variables included in the regression. Figures A1-3 are histograms of the distribution of the dependent variable, ideological distance, and the two main independent variables, gender and racial disproportionality.

	Count of Obs.	Min	Median	Max	Mean	St. Dev.
Ideological Distance	99	0.010	0.401	1.148	0.422	0.255
Gender Proportionality	99	52.931	71.350	90.592	70.961	8.089
Racial Proportionality	99	79.133	92.541	98.893	92.268	4.332
House	99	0.000	0.000	1.000	0.495	0.503
Democratic Controlled Chamber	99	0.000	0.000	1.000	0.465	0.501
Democratic Governor	99	0.000	0.000	1.000	0.485	0.502
Legislature Professionalization Score	99	2.700	14.800	62.600	18.349	11.548
Seats in Legislative Chamber	99	20.000	52.000	400.000	74.566	53.606
State Population (Millions)	99	0.503	4.150	35.253	5.832	6.408
Term Length	99	2.000	2.000	4.000	2.889	0.999
Chamber Turnover	99	0.000	21.000	76.000	23.687	13.370

Table A1: Summary Statistics for All Regression Variables

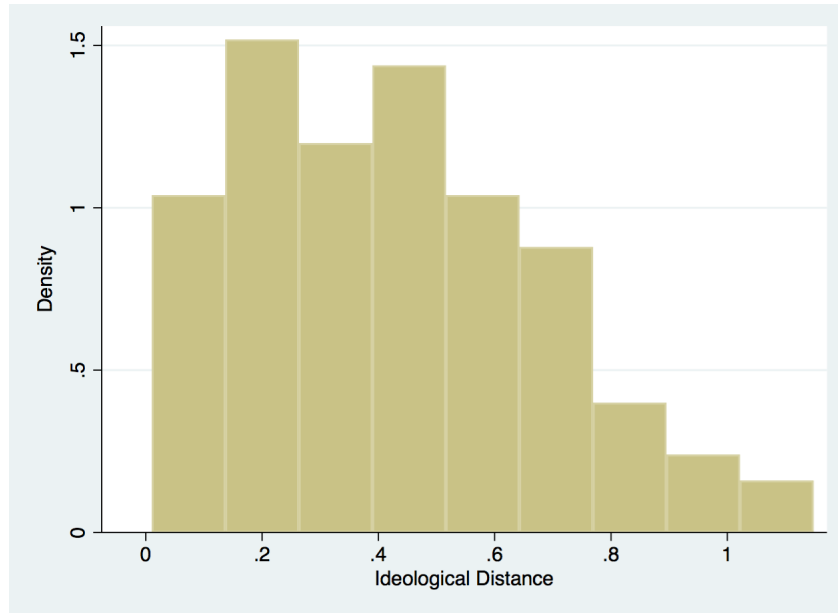


Figure A1: Distribution of Dependent Variable Ideological Distance Between Legislative Chamber and State Population

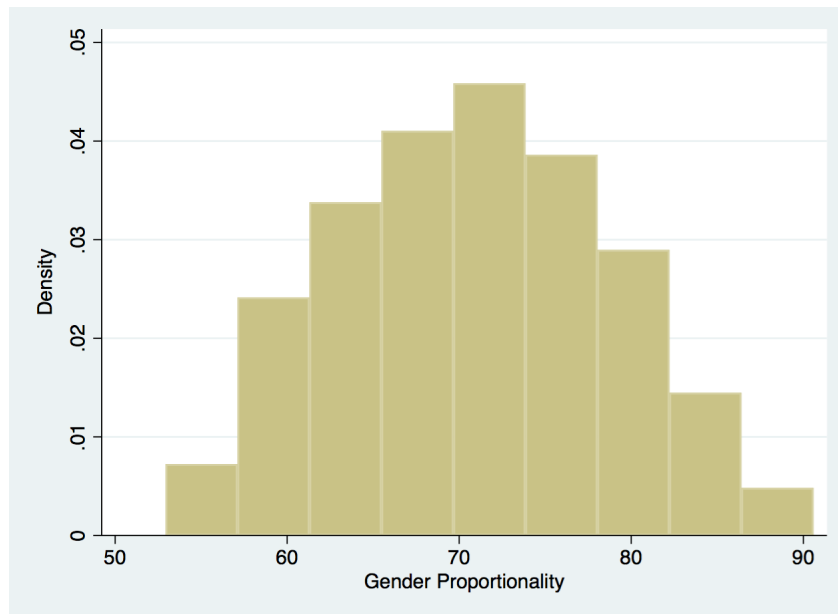


Figure A2: Distribution of Independent Variable Gender Disproportionality of State Legislative Chambers

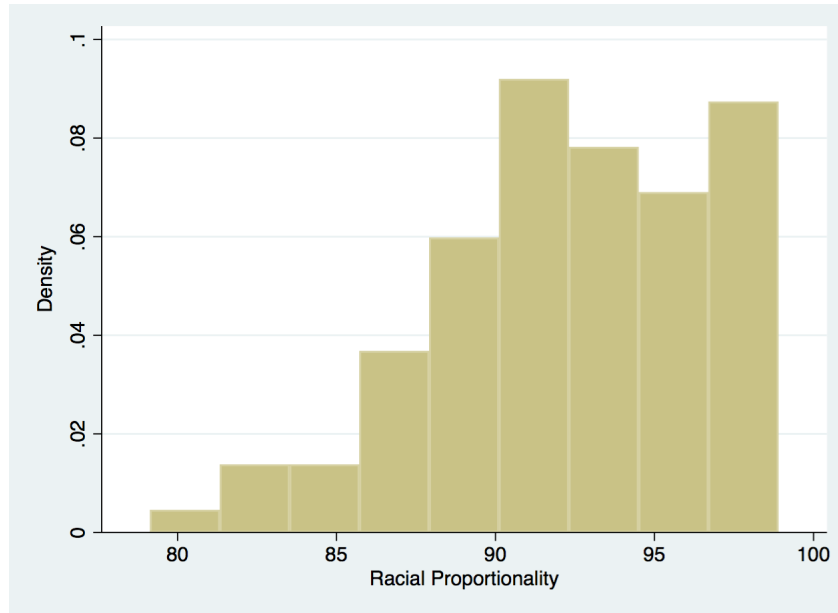


Figure A3: Distribution of Independent Variable Racial Disproportionality of State Legislative Chambers

## Appendix B - Additional Material

Variable Concept	Variable Name	Source Data Set	Source Variables	Variable Type	Coding Scheme
Ideological Distance	ID_dist	Shor-McCarty (Chamber); Berry et al. (Population)	hou_chamber; sen_chamber; ctif6013	Continuous	Absolute value of the difference between population ideology and chamber ideology Range:[0,4]
Gender Proportionality	chamber_proport_gender	NCSL; U.S. Census Bureau	$\sqrt{\frac{1}{2} \sum_i (v_i - s_i)^2}$ $s_i = \% \text{ of population}$ $v_i = \% \text{ of chamber}$	Continuous	100=Fully Proportional; 0=Fully Disproportional
Racial Proportionality	chamber_proport_race	NCSL; U.S. Census Bureau	$\sqrt{\frac{1}{2} \sum_i (v_i - s_i)^2}$ $s_i = \% \text{ of population}$ $v_i = \% \text{ of chamber}$	Continuous	100=Fully Proportional; 0=Fully Disproportional
Legislative Chamber	chamber	N/A	N/A	Dichotomous	1 if State House; 0 if State Senate
Democratic Chamber	chamber_dem	Shor-McCarty	N/A	Dichotomous	1 if Democrats control the chamber; 0 if Republicans control the chamber
Democratic Governor	demgov	NGA	N/A	Dichotomous	1 if Governor is a Democrat; 0 if Governor is a Republican
Legislature Professionalization	prof	Squires	N/A	Continuous	1= perfect resemblance to Congress; 0=no resemblance to Congress
Seats in Chamber	seats	NCSL	N/A	Continuous	Number of Seats
State Population	totalpop	U.S. Census Bureau	N/A	Continuous	Population in Millions
Term Length	term	NCSL	N/A	Continuous	Term length in years
Chamber Turnover Rate	turnover	Book of States	N/A	Continuous	Percentage of seats changed in prior election

Table A2: Variable Coding Schemes

## Appendix C - OLS Specification Tests

In this section I check the assumptions of OLS, specifically, I test for heteroskedasticity and multicollinearity. The results of the Breusch-Pagan and VIF tests are below.

Model	Test Assumptions	Test Statistic	p-Value
Gender	Default	$\chi_1^2=0.82$	0.366
	IID	$\chi_1^2=0.87$	0.351
	F-Stat	$\chi_1^2=0.86$	0.357
Race	Default	$\chi_1^2=1.05$	0.305
	IID	$\chi_1^2=1.15$	0.284
	F-Stat	$\chi_1^2=1.14$	0.289

Table A3: Breusch-Pagan Test for Heteroskedasticity Results - No Heteroskedasticity Detected

	VIF
Gender Proportionality	1.170
House	2.729
Democratic Controlled Chamber	1.061
Democratic Governor	1.037
Legislature Professionalization Score	2.482
Seats in Legislative Chamber	1.867
State Population (Millions)	2.389
Term Length	1.925
Chamber Turnover	1.133

Table A4: VIF Test for Multicollinearity on Gender Model - No Multicollinearity Detected

	VIF
Racial Proportionality	1.286
House	2.730
Democratic Controlled Chamber	1.073
Democratic Governor	1.043
Legislature Professionalization Score	2.362
Seats in Legislative Chamber	1.982
State Population (Millions)	2.552
Term Length	1.923
Chamber Turnover	1.155

Table A5: VIF Test for Multicollinearity on Race Model - No Multicollinearity Detected

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