
Volume 22

Issue 4 *Overcoming Women's Subordination:
Socialization, Law and Structural Inequalities.
The 6th World Conference on Women's Studies,
Colombo, Sri Lanka, 29-31 May 2020*

Article 5

April 2021

Improving Candidate-Quality Preference-Specification Mechanisms: Incorporating (Gender-Empowering) Voter-Chosen Quotas

Vishal Wilde

Follow this and additional works at: <https://vc.bridgew.edu/jiws>



Part of the [Women's Studies Commons](#)

Recommended Citation

Wilde, Vishal (2021). Improving Candidate-Quality Preference-Specification Mechanisms: Incorporating (Gender-Empowering) Voter-Chosen Quotas. *Journal of International Women's Studies*, 22(4), 54-77.
Available at: <https://vc.bridgew.edu/jiws/vol22/iss4/5>

This item is available as part of Virtual Commons, the open-access institutional repository of Bridgewater State University, Bridgewater, Massachusetts.

Improving Candidate-Quality Preference-Specification Mechanisms: Incorporating (Gender-Empowering) Voter-Chosen Quotas

By Vishal Wilde¹

Abstract

I conceptualise the informal outlines of a new voting system/mechanism that is more holistic and democratically just; the proposed alternative would incorporate (gender) quotas amongst other fundamental, important aspects. This conceptual outline seeks to resolve the primary (intellectual) obstacles for the adoption of quotas in their current form which, I contend, is their discordance with mainstream conceptions of democratic justice. More precisely, the conceptualised voting system/mechanism seeks to increase the sophistication of preference-specification in voting procedures (thereby presenting an alternative to the prevailing, privileged paradigm of geospatial-constituency representation). I do not present results in the conventional sense; no data was analysed, no experiments run, and no software implemented. A rationale is provided for why this proposed voting system/mechanism, in addition to potentially solving/tackling some problems identified by feminist scholarship, could also solve an even larger class of fundamental political and democratic problems related to intersectionality (e.g., race, ethnicity, income, class, caste, disability, sexuality, education, age, occupation etc.) through enhancing the translation, representation, and implementation of voters' interests. In terms of conclusions within the paper, they are largely intermediate conclusions as they relate to the investigation of problems as well as the informal conceptual outline of the proposed voting system/mechanism.

Keywords: Democracy, Justice, Voting, Democratic Innovation, Representation, Gender Empowerment, Gender and Development, Social Choice, Mechanism Design, Algorithmic Game Theory, Algorithmic Mechanism Design, Political Quotas, Quotas

Introduction

“Democracy is in crisis.” Words to this effect reverberate throughout the echo chambers of contemporary politics. A range of interpretations abound; the referent crisis is at the confluence of multiple (systemic) problems. The perennial crises of modern democracies are not confined to democracies; these crises stem from the intrinsic problems faced by all forms of collective decision-making, (political) organisations, and societies; specifically, problems encountered before, during, and after the translation, representation, and implementation of peoples' interests.

Democracy itself can be viewed as a natural response to the aforementioned problems. Consider Monarchy, Aristocracy, Tyranny, Despotism, Oligarchy, Plutocracy, Empire, and other forms of government: characteristically, although a subset of interests are translated, represented and implemented, the interests of the majority were inherently excluded (or at least inadequately translated, represented and implemented). Democratic forms of government have sought to ensure

¹ [LinkedIn](#) Affiliations: Independent and Civil Service, United Kingdom

or improve justice and fairness in the translation, representation and implementation of interests through various mechanisms (e.g. freedom of speech, a free press etc.) and especially through the provision of one vote for each and every eligible person (often citizens) during political elections; this enshrined a sense of intrinsic equality through political rights and thereby enabled the political freedoms of self-determination and self-government. Even so, modern democracies continue to experience numerous complex problems when translating, representing and implementing the specificity of peoples' complex preferences to enable *substantive* self-determination and *effective* self-government. This paper aims to begin addressing those problems by conceptualising a novel voting system.

While presenting the conceptual outlines of this novel voting system, the paper also incorporates a preliminary investigation of parts of the political gender quotas literature. Feminist scholarship has been remarkable at identifying several key problems relating to the translation, representation, and implementation of women's' interests, and the lessons learnt are relevant for humanity. Indeed, before perusing the political gender quotas literature, I was personally convinced that 'imposed' gender quotas on countries' legislatures are intrinsically undesirable because of gender quotas' theoretical restriction of voters' choice (in terms of social choice theory, it is a 'restricted domain'; Arrow (1950, 1963), Gibbard (1973), and Satterthwaite (1975) analysed the profound significance of this). The normative significance of restricting voters' choices is apparent in the context of representative democracies most often being characterised by voters' *right to choose* their representatives; therefore, one could cogently argue that the restriction of choice is inherently undemocratic.

However, upon examining some of the literature on political quotas for women, various valid concerns and deeply disturbing problems emerged that should not be dismissed; these concerns and problems are particular cases of broader, more general issues with respect to the stifled translation, representation, and implementation of peoples' interests. Learning from problems and seeking solutions can facilitate solutions for broader classes of problems across (democratic) voting systems and mechanisms. When solutions adhere to the constraints and demands of democratic justice, they can be used for systemic political reform. The potential applications outlined within this paper are primarily designed for a democratic political context; even so, variations of voting systems are used in numerous other domains (e.g., education, employment, healthcare, equity markets, etc.), and insights from the research presented herein is relevant for other domains. Alternative settings and contexts can be more general in some respects whilst simultaneously more restrictive in others, especially compared to democratic voting systems characterised by one vote per voter.

Methodology and Brief Outline of Voting System

When considering the potential for quotas to be a sufficient means for encouraging more gender-equitable forms of political representation, it would be fruitful to examine the conceptual basis of quotas alongside the theoretical and actual outcomes. Proceeding accordingly, I contend that quotas imposed by a legislature upon the electorate, political parties and/or on legislative entities are not necessarily sufficient for actualising gender-equitable forms of political representation. Nevertheless, I concede that voluntarily implemented quotas routinely do not achieve the desired effects and, therefore, that more systematic voting system reform is needed. I conjecture that the principal (intellectual) obstacle for the current form in which gender quotas are advocated is that they do not accord with (mainstream) conceptions of democratic justice and that

the legitimate concerns and objectives of arguments for quotas can be addressed in ways that resolve tensions with conceptions of democratic justice. I present my alternative conception of incorporating quotas within a more holistic, general framework for reforming representative democracies' voting systems in ways that do not, for example, inherently privilege geospatial-constituency paradigms of democratic representation.

Advocating the form of gender quotas outlined in this paper may win more supporters and be a sufficient means for encouraging more gender-equitable forms of political representation to advance gender empowerment. Moreover, the mechanisms advocated here could theoretically advance the translation, representation, and implementation of interests beyond those of gender empowerment because the proposed solutions can be used (without loss of generality) to solve larger, encompassing classes of problems. The pressing concerns of intersectionality, covered especially by modern and contemporary feminist scholarship and activism, can thereby be addressed (for discussions of 'intersectionality' see, for example, Yuval-Davis (2006), Davis (2008), Choo and Ferree (2010), Shields (2008), McCall (2005), Nash (2008), Crenshaw (1989), Bilge (2010), Alexander-Floyd (2012), Brah and Phoenix (2004), Cho, Crenshaw and McCall (2013), and Collins (1998)). Essentially, by solving the problems that are identified and actively confronted by contemporary feminist and women's' interest scholarship in ways that accord with democratic justice, equality, and freedom to choose, an even larger class of problems can be solved; thus, it would be in the general interest and extremely rational to do so.

Restricting voters' choice is intrinsically problematic for achieving social justice objectives; an alternative is to *increase* voters' choice. In representative democracies, a 'candidate' in elections is someone who can be elected to public office (through some voting mechanism or procedure). In Social Choice Theory, the word 'candidate' is also used to denote any *outcome* of a voting mechanism/system. In this paper, the term 'candidate' will be used in both senses and is intended to be amenable to contextualisation by the reader. Initially, fundamental aspects of the proposed voting system are introduced and briefly rationalised before presenting the problems and benefits identified by the gender quotas literature.

Properties and aspects of the voting system

Aspect 1: Allow voters to divide their votes (i.e., do not continue restricting votes to being indivisible). Voters would retain single, equal votes (i.e., one vote per eligible person), but they could divide and allocate them amongst different candidates accordingly. Therefore, the principle of democratic equality is maintained while voters could exercise greater choice. One might suggest that this would not be practical in a rank-order voting system, but if voters each have one and only one vote, one could also conceive of voters being able to *divide* their votes among candidate-quality preferences (discussed in aspect 5), the interests they seek to be translated, represented, and implemented (discussed in aspect 4) and therefore between different rank-orders. Pertaining to mathematical optimisation, the problem of who or what to vote for thus becomes 'relaxed' into a continuous (as opposed to discrete) constrained optimisation problem.

Aspect 2: Allow voters to (re-)allocate their votes as frequently as wanted: i.e., enable continuous re-allocation rather than merely periodic re-allocation. This property would entail voters no longer having their votes' re-allocation confined to election periods. A question here is, even if votes are re-allocated frequently, does that mean that a politician is simply removed or elected after crossing particular thresholds? Enacting such thresholds risk being arbitrary, problematic, and impractical but, combined with aspect 6 (where voters can empower

representatives to varying degrees rather than ‘equal weights’ within the legislative body), this becomes practicable and potentially palatable. One may argue that if the social justice objectives of quotas are met then there is no need to frequently re-allocate votes. When admitting the possibility for the different dimensions of peoples’ experiences (gender, ethnicity, religion, race, class, education, occupation, sexuality, disability etc.) to be of varying importance over time, it is justifiable to allow voters to re-allocate votes according to self-determined frequencies. Indeed, simplistically presuming that particular dimensions of peoples’ experiences periodically vary in importance, the problem of vote re-allocation could be algorithmically reduced to a continuous form of the ‘Bamboo garden trimming problem’ presented by Gaşieniec et al. (2017); moreover, scheduling problems are well-studied in Computer Science (e.g., Lin and Lin (1997), Serafini and Ukovich (1989), Fishburn and Lagarias (2002), and Chan and Chin (1993)).

Aspect 3: Allow voters to specify what portions of their votes are to be allocated to each candidate. This follows naturally from being able to divide one’s vote. When considering the possibility of one agreeing with various (or all) candidates on a variety of issues to different extents, this property is a natural inclusion in a preliminary list of mechanistic improvements to voters’ choice. In an election with three candidates A, B, and C, a voter can assign varying fractions of their vote respectively to each of the candidates (or less, if they wish) so long as the sum of all portions assigned are lesser than or equal to one (thereby adhering to the democratic equality principle). The mechanism could further allow voters to actively vote against a candidate. Say a candidate receives 16.2 votes and a certain voter, rather than voting *for* another candidate, would rather actively and wholly vote *against* this candidate, the voter could decrement the candidate’s votes from 16.2 to 15.2 (or by any other number less than one, should they prefer).

Aspect 4: Allow voters to specify the interest(s) they wish to be represented and implemented through the candidate (and, potentially, how they want them to be represented and implemented, if this extent of specificity is preferred), corresponding to (the portions of) their votes that are allocated to each candidate. Through this property, voters can specify a subset of interests that they want represented and *how* they want them represented. For example, if voters choose to assign some fractions of their votes to candidates, they can further specify portions of that fraction to represent their gender interests, their geospatial community’s interest (e.g., village, town, city, region), their ethnic and racial interests etc., or voter-determined weightings of subsets of those qualities. Then, for example, voters could also specify that their gender interests (for example) should be represented through certain policies, that their community interests be ideally represented through increased local infrastructure development and so on. Voters can also simply leave that specificity open to candidates whom they trust to represent the various dimensions of their interests. This aspect can also be used to advance the translation, representation, and implementation of other peoples’ interests (i.e., voters expressing preferences over other peoples’ interests, including non-voters). After all, many voters may have never experienced sexism, misogyny, racism, ethnicism, ableism, homophobia, transphobia, xenophobia, sexual abuse, paedophilia, poverty, unemployment etc. but those voters may still choose to vote for candidates who will confront such problems. A safeguard is that if a politician reneges or performs in a non-satisfactory way for the voter(s), voters can re-assign/redistribute their votes. Thus, this property deters unwarranted flexibility from politicians, especially where politicians may otherwise misinterpret the imperfectly signalled ‘will of the people’. The property further incentivises honesty from both voters and candidates. The specifics of the mechanism(s) required to practically implement this property are debatable. Moreover, designing the mechanism beyond the conceptual

outline in this paper is beyond this article's scope; it will require recourse to formal methods in algorithmic mechanism design and related fields.

Aspect 5: Allow voters to specify their necessary, sufficient, and/or desirable qualities of the candidates they seek to assign/have assigned portions of their votes to. Following from the previous aspects, we naturally turn to the ability of voters to choose the qualities of the candidates themselves. Voters can (algorithmically) specify necessary, sufficient and/or desirable conditions for their votes to be allocated to in a candidate. It still remains to be determined whether this would be from a list of all candidates (i.e. an 'omega set' of candidates that encompasses all possible candidates, potentially including those who may not ordinarily or explicitly put themselves forward as candidates) or whether the specifications of candidate-qualities from voters would then be aggregated according to whoever has the overlapping candidate-qualities prior to a pool of candidates being identified as eligible and/or solicited before another round of voting procedures commence. There can also be an element of choice regarding how the preferences are aggregated, but, once again, the specific mechanism to be used is debatable. For example, voters may choose to allocate fractions of their singular vote to candidates who are of gender X, socioeconomic background Y, with educational level Z, race A, ethnicity B, disability C, sexuality D, religion E, caste F, income G, from age range H, occupation I, previous occupation J, with institutional affiliation K, ideology L etc. This set of preference-specifications can be readjusted according to voters' intentions and the nature of the relation of the voter's preferences to the specific interests the voter wants represented (and how the voters want those interests to be represented), relating back to aspect 4 of this voting mechanism. Through aggregated candidate-quality preferences and votes assigned, 'seats' could be allocated in corresponding legislatures according to voter-chosen quotas.

Aspect 6: Elected candidates/representatives can have varying degrees of voting power/influence in legislatures according to the extent of voters' choice to empower them (i.e., rather than each elected politician being restricted to having the same voting power as other politicians, voters would collectively choose the extent of their relative voting powers within a legislature). Elected representatives in modern democracies have equally weighted votes in the legislatures they are elected to. However, the rationale for this appears to be one of historical practicality; that is, it is not clear why each elected representative should have equal weighting of votes in the legislature compared to other representatives in the same way that it is justifiable that, from a democratic justice and equality perspective, voters should have equally weighted votes during elections. One potential justification for elected representatives having equal weight is within the context of a geospatial-constituency paradigm of representation. An initial thought for mechanisms to determine respective voting 'powers'/'weights' of each representative could be based on proportionality (i.e. the weight of a representative's vote in a legislature relative to other representatives is proportional to the votes assigned to them as a proportion of the total amount of votes cast). This could entail the number of members of a legislative body increasing and decreasing over time according to voters' aggregated preferences, especially as voters re-assign their votes according to the specificity, translation, and representation of candidate-quality preferences (aspect 5) so that the diversity, intensity, and significance of preferences are sufficiently captured. However, if elected representatives have differing voting powers within their legislatures (weighted by votes assigned or otherwise), the compensation of elected representatives may need to be iterated to prevent systemic abuse. Representatives' pay is non-trivial and beyond this article's scope but is further discussed in relation to an identified problem later in the paper (the opportunity cost of being a politician). Moreover, there is a significant body of research

regarding politicians' pay (e.g., Besley (2004), Kotakorpi and Poutvaara (2011), Tella and Fisman (2004), Braendle (2015), and Ferraz and Finan (2009)).

The mathematical constraint and democratic justice principle of one vote per votes has not thus far been violated, and expansions of voters' choice have been sought. One critique of this voting system is that it is complex with regard to comprehensibility and computability. But this is not an intrinsic, system-fault because comprehensibility is a matter of voters' education regarding the system whilst (problematic) computational complexity can be managed through more sophisticated algorithmic mechanism design (a formal, thorough exploration of which would be beyond this paper's scope and purpose).

It is worthwhile to examine key problems identified by the gender quotas literature (which can and often does align problems in political economy and public policy more broadly) that can be solved through this voting system/mechanism and, where they cannot be solved directly, to suggest further potential solutions that can be appended to and/or articulated within this voting system and mechanism(s).

Investigating the Conceptual Basis for Quotas

Proponents and detractors of gender quotas routinely address dimensions of utility and justice. Proponents may illustratively argue that a diverse legislature that better reflects society is intrinsically just and conducive to superior political performance. Detractors may argue that it is intrinsically unjust to legally restrict voters' choice and that, if women cannot navigate through politics to get elected through 'open competition', performance is compromised. Detractors might also dispute the epistemic benefits of diversity, but such arguments run counter to principles of democratic justice and equality; voters ultimately choose representatives and the (non-)diversity is therefore ultimately chosen by voters (albeit in historically restricted and imperfectly collective capacities). There are merits to at least some of both proponents' and detractors' arguments, but there is a unifying theme which shows that there are crucial points of overlap, despite distinct differences.

Detractors are correct that it is unjust to legally restrict voters' choice because this runs counter to principles of democratic equality and justice. Even presuming that restricting voters' choice improves outcomes, if this line of reasoning is taken to its logical ends it facilitates a (democratic) variation of technocracy pertaining to the representation of peoples' interests; consequently, it may prove to be a 'slippery slope' (even if unintended by activists). For well-intentioned detractors, the ends do not justify the means; permitting the underlying allows for some dangerous possibilities that threaten democracy. Conversely, a common reason proponents advocate this restriction of voters' choice is because they believe various constituents' interests would be better represented, while detractors' *a priori* grounds are that, when the domain of voters' choice is restricted, there is a strong chance that the representation of constituents' interests will be compromised. Trying to frame this in the language of Social Choice theory, gender quotas' proponents might further contend that the choice of candidates is already practically restricted due to institutional factors; therefore, a restriction *in principle* could, *in practice*, increase the choice of candidates. Detractors of gender quotas believe quotas will impose rigid restrictions on voters' choice. Mainstream proponents and detractors both, therefore, seek to improve and/or defend conceptions of choice insofar as it advances the translation, representation, and implementation of voters' interests.

Returning to proponents' arguments that diverse legislatures that better reflect society are intrinsically desirable: these arguments align with the justified belief that a diverse society's interests may be better translated, represented, and implemented by correspondingly diverse representatives. Aside from benefits associated with *symbolic representation*, it is important to explain why a diverse set of representatives would be intrinsically preferable to a non-diverse set of representatives if they were not, in principle or in practice, superior in translating, representing, and implementing society's interests. As mentioned previously, detractors may contend that an inability to navigate 'free and open competition' to get elected may increase the likelihood of comparatively poorer performance as representatives; this argument does not address the continued inadequate representation and the feeling of disproportionate underrepresentation of distinctly gendered dimensions of policy, despite purportedly 'free and open' competition. Arguments based on democratic justice and utility are intertwined and inextricable. A common objective is expanding choice, but conflicts remain around *how* that choice ought to be expanded and whether certain choices ought to be restricted.

Phillips (1995) analyses arguments against gender quotas and suggests that "while concerns about social divisiveness and sectional narrowing are part of the standard fare in arguments against other forms of group-based representation, opponents of gender quotas are most likely to take their stand on a general critique of affirmative action, on the paucity of 'experienced' women, and the risk that the overall caliber of politicians will fall." Although it has been some time since Phillips' paper was published, it is worth noting that Phillips convincingly eviscerates each of these arguments but does not address broader theoretical questions: namely, the tensions that gender quotas have with (mainstream) conceptions of democratic justice and the contention that the introduction of quotas could reinforce the (possibly subconscious) divisive mentality prevalent in patriarchal societies that women should cater to women's interests and men to men's'. The former makes quotas theoretically problematic to implement. Therefore, I will address this more within this article, but it is also worth examining whether the potential for social divisiveness can be alleviated through the proposed voting system reform.

Quotas potentially reinforcing social divisiveness

Society is already 'divided' along numerous lines (e.g., gender, class, race, religion, ideology, age, class, education, institutional affiliation, profession, income etc.); these divisions have arisen regardless of quotas. Difficulties remain for accurately measuring the *nature* of societies' divisions, prioritising those in need of addressing, and deciding *how* to address them. If voters can specify candidate-qualities through the reformed voting system (by aspect 5 in the preceding 'Methodology...' section) as well as their interests they want advocated (aspect 4), this would provide some factual bases to form various indices to understand divisions. Therefore, candidates seeking election, according to the proposed 'voter-chosen' quotas or otherwise, would be incentivised to address the interests corresponding to those voter-chosen quotas; otherwise, elected representatives risk diminished voting power (aspect 6). From aspect 4 (where voters can choose *what* interests are represented and, potentially, *how* those interests are represented), peoples' discontents can be formalised within votes rather than their votes being indicators of reality. Through aspects 5 and 6, candidates can better discern their constituents' preferences and also the divisions amongst constituents (who would no longer necessarily be bound to geospatial communities). Aspect 4 also enables voters to 'lend their votes' to benefit another group (i.e., vote in a way that advances another group's interests).

Gender quotas placed upon legislatures may indeed encourage more gender-equitable forms of political representation, but this comes at the cost of restricting voters' choice through, for example, seat-reservation. One might justifiably argue that the choice is already largely and practically restricted to males from particular socioeconomic backgrounds, but, in principle and by law, women representatives are not usually formally prevented from being elected except, for example, due to prevailing patriarchal institutions that perpetuate (possibly subconscious) sexist prejudice and stereotyping during selection procedures (Edwards and McAllister 2002; Shepherd-Robinson and Lovenduski 2002; Dittmar 2015; Krook and Nugent 2016; Ashe 2017). This unfairly leads to female politicians generally needing to be better than their male counterparts to be selected and to win (see Elgood et al. (2001), Paul and Smith (2008), Mo (2015)).

Institutional sexism, stereotyping, and prejudice during candidate selection

Institutional sexism reinforces stereotyping and prejudice during candidate selection procedures leads to female politicians needing to be better than their male counterparts to be selected and to win. The proposed voting system can completely bypass the political party system since constituencies would no longer be constrained to a geospatial-paradigm; voters could continue choosing to coalesce with their geospatial constituencies, depending on the quota and preferences specified, but they would no longer be required to. Moreover, there is considerable scholarship regarding 'gerrymandering' by political parties and politicians (Rorabacher 2008; Singh 2000; Issacharoff 2002; McCarty, Poole and Rosenthal 2009; Johnston 2002; Giugăl et al. 2017). Since political parties' bases of local power could be bypassed through non-geospatial quotas, rational political parties would need to field more women candidates to fill voter-chosen quotas and/or to prevent dilution of power (by aspects 4, 5, and 6 in the 'Methodology...' section); political parties that remained unresponsive to voter-chosen candidate-qualities would risk diminished influence unless they successfully tackled sexist stereotyping and prejudice. Elected representatives not affiliated with political parties would be incentivised to be more responsive to the specificity of their constituents' interests as opposed to federal/regional/local party policy. Political parties may also become more responsive and reflective with their outlooks. Moreover, the effects of nonpartisanship have been explored in empirically observed contexts (Schaffner, Streb and Wright 2001; Bonneau and Cann 2015; Kirkland and Coppock 2017). Voter-chosen gender quotas would also mitigate female candidates' need to directly contend with voters' sexist biases, especially where candidates run to fill voter-chosen quotas.

Inequalities and differences among and within groups

Democracy can be broadly characterised as being about 'power to the people'; legally restricting the domain (along gendered lines or otherwise) from which voters' preferences can be expressed risks undermining core democratic values (e.g., by restricting the formalisation of competing and/or complementary 'representative claims', see Saward (2006, 2010)). I contend that this tension is currently the principal (intellectual) obstacle to garnering support for and enacting adoption of quotas. An arising corollary is that if one were to restrict the electorate's choice, this simultaneously restricts many female voters' choice to electing females; this may not reflect the preference of *all* women. This tension is further compounded by the focus on intersectionality in contemporary, mainstream feminist thought, advocacy, and activism; introducing quotas for women may prove insufficient given that various overlapping allies (e.g.

the LGBTQIA+ community and ethnic minorities) may be under threat of further marginalisation despite gender quotas. Many American and British feminists argued throughout the 1980s and 1990s that focusing attention on inequalities and differences between men and women is problematic because it tends to marginalise the various significant inequalities and differences among women themselves (see Collins (2000), Mohanty (1991), and Spelman (1988)). Citing, as an example, racially-based inequalities in the USA, Black and Hispanic women were found to face the biggest gender pay gap versus White males and earn significantly less than White and Asian women (Gould, Schieder and Geier 2016) despite the productivity gains associated with both ethnic and gender diversity (Hunt, Layton and Prince 2015). Moreover, they have additional work-related stressors to contend with compared to White women (Hall, Everett and Hamilton-Mason 2012). In the Indian context, examples of inequalities between women include racism faced by North-East Indians (McDuié-Ra 2015a, 2015b; Gohaini 2014) and caste differences (Deshpande and Sharma 2016).

Through enabling varied degrees of candidate-quality specifications (by aspect 5 from the ‘Methodology...’ section), the capability to decide *what* interests are represented, *how* they are represented (aspect 4), and the ability to divide the vote (aspect 1), voters could specify their ideal mode of representation according to the inequalities they face. The aspects of the proposed voting system allow for inequalities and differences among women and other groups to be accounted for by voters and their representatives. Numerous representative democratic voting systems currently privilege geospatial constituencies for representation as opposed to other potential constituencies (e.g., gender, socioeconomic background, race, culture, ethnicity, caste, sexuality, age, disability, profession, income, institution, ideology etc.); the concerns of intersectionality are insufficiently unaccounted for in representative democracies’ legislatures, voting systems, and institutions. For example, a poor, lesbian, transgender woman may have far more in common with the LGBTQIA+ community across her country rather than the geospatial constituency she is clumped together with in elections (where she is often more likely to be either a distinctly disadvantaged or even disenfranchised minority). She could choose to coalesce with some parts of the LGBTQIA+ community rather than others or, alternatively, to coalesce on other grounds (e.g. LGBTQIA+ and profession or LGBTQIA+ and class).

Permanent quotas are rigid and static

This proposed voting system/mechanism would also inherently address Mansbridge’s (2010) insightful recommendation that because “the benefits of descriptive representation vary greatly by context, it would be wise, in building descriptive representation into any given democratic institutional design, to make its role fluid, dynamic, and easily subject to change” since “permanent quotas are relatively undesirable because they are both static and highly essentializing. They assume, for example, that any woman can stand for all women, any Black for all Blacks. They do not respond well to constituents’ many-sided and cross-cutting interests.” The proposed voting system and mechanism(s) enables women and Black people, for example, to pick the specific sort of women and/or Black people they would like to represent them (whilst also specifying the exact interests they want represented); it also enables women and Black voters to vote for non-women and non-Black candidates with particular qualities to represent their specific interests. This extends to gender more broadly, all races, classes, ethnicities, religions, castes, sexualities, disabilities, age ranges, educational backgrounds, income groups, professions, ideologies etc. The dynamic, ‘ongoing’ nature of the voting system (aspect 2 within the

‘Methodology...’ section) where voters can continuously re-assign their votes also means that any voter-chosen quotas are not rigid or static because voter-chosen quotas are responsive to voters’ malleable preferences.

Nevertheless, one may argue that women may still not choose gender quotas because many have internalised sexism from the prevailing patriarchy. While valid, I will not proceed along the patronising and dehumanising lines of argument suggesting that, because women are oppressed, they do not know what is in their best interest; I instead suggest that if quotas are in women’s’ best interests it is advantageous to offer a chance to *choose* them and thereby empower them alongside all voters more broadly. Even so, it is worthwhile examining whether internalised sexism and misogyny can be countered through this proposed voting system reform.

Internalised sexism and misogyny

Internalised sexism and misogyny may prevent gender quotas from being chosen by voters in the reformed voting system. This is distinct from but analogous and related to internalised ethnicism, racism, ableism, homophobia, transphobia, casteism, classism, xenophobia etc. Psychologically internalised discrimination, prejudices, and stereotypes that result in cognitive distortions are difficult to mitigate. Reminding the reader that the proposed voting mechanism(s)/system have an unrestricted domain through which voters can also promote the welfare of others (included in aspect 4 in the ‘Methodology...’ section), those voters’ objective of helping others can help confront internalised discrimination, prejudices, and stereotypes. For instance, although movements for women’s suffrage globally were primarily led and composed by women, many women did *not* assist, while numerous men did; historically and globally members of an ‘out group’ have often supported various Civil Rights movements. I concede, however, that this channel/benefit is not adequately developed or convincing.

The Outcomes of Political Quotas: Mixed Results

Though this proposal may be worthwhile in principle, it may not result in desired outcomes in practice. It would be valuable to examine outcomes from the actual implementation of quotas whilst relating the problematic aspects back to this article’s proposals.

The opportunity cost of political activity is too high

Everett (2009) found that “the impact of reserving one-third of local elective offices for women on the substantive representation of women appears ambiguous” in India and that EWRs (elected women representatives) “continue to face many obstacles” such as the chronic stressors associated with the “triple burden”. For example, Hust (2004) described the case of a poor Dalit (Dalits being a historically disadvantaged group in India) EWR in the state of Orissa in India: she does not attend political meetings during the planting season since the monetary opportunity cost is too high; she could earn 50 rupees a day through casual labour whilst the local governments’ sitting fee is only 30 rupees and there were difficulties associated with obtaining payments in a regular manner. Political lives and careers are often perceived to be the preserve of the wealthy and privileged. Within the context of the proposed voting system, politicians have a mandate to directly represent particular constituents’ interests; politicians/candidates may well benefit from voluntarily incremented funding from various communities and ‘Special Interests’ to supplement

any fixed salary received. If elected representatives perform well when translating, representing, and implementing peoples' interests, either the constituents themselves or allies of the constituents may choose to increase funding to the representatives, thereby decreasing the opportunity cost of political activity. Taxpayer-funded compensation is the norm for elected politicians across countries; one could implement various compensation schemes according to the various roles the elected representatives take up within their legislatures and proportional to the aggregate (portions of) votes received to represent constituents (aspect 6 from the 'Methodology...' section).

Constrained expression

Bryld (2001) quotes an EWR from the state of Karnataka in India as saying "Every time men speak ten sentences, women speak one"; this exemplifies an important difficulty for representing and implementing interests through legislatures, where expressive capabilities are constrained. Although expressive capabilities are broader than speech (e.g., body language, writing, transmission channels available for disseminating viewpoints, culture, norms, values, beliefs etc.), the concern addressed here primarily pertains to speaking. One simplistic solution is that, if there is one man and one woman and the man speaks 10 sentences for every one sentence the woman speaks, voters could send 10 women instead of one (albeit each with proportionally diminished voting power) so that, in aggregate, the elected women representatives can speak 10 times as much as previously. However, this is a somewhat presumptuous and trivial numerical solution aside from the fact that it may prove beneficial for groups that are in such a small minority that even having one person symbolically and descriptively speak for them could be highly beneficial (despite diminished voting power).

A more potent solution is that if elected representatives behave in a way that displeases voters, not only will voters be able to retract their vote, but they could even use (portions of) their vote to actively vote *against* and diminish the voting power of that representative (aspect 3) whilst specifying why. Representatives continuing to behave in ways that are met with voters' disapproval would see their voting power further diminish and, therefore, they would experience institutional incentives to correct their behaviours. Coupled with previously cited problems and accompanying potential solutions regarding politicians' pay and opportunity costs, this could also translate to financial incentives for elected representatives to respect others' viewpoints.

Harassment and violence

The violence that EWRs can face is particularly worrying. Krook (2017) documented and described violence towards women in politics more broadly. George Mathew (2004) reported that a tribal woman in the state of Madhya Pradesh in India burned herself to death in 2003 after being harassed by "corrupt officials." Water tank owners in the city of Madurai in the state of Tamil Nadu murdered a woman councillor when she set up a water system that put them out of business. Violence against EWRs stems from the grassroots threats of physical violence and harassment that patriarchal institutions have historically and contemporarily sought to legitimate against women. As with the previous problems, voters could actively vote against particular aspects of representatives' and those representatives' allies' cultures; however, cultural transformations are not straightforward.

Moreover, if the proposed voting system was implemented there is a strong likelihood that there would be more representatives (women or otherwise) who would have mandates to translate,

represent, and implement gender-empowering policy; gendered shifts in policy along with the increased diversity of elected representatives can substantively challenge patriarchal institutions. While social attitudes will not disappear through voting system reform, the voting system does facilitate grassroots empowerment. Therefore, various interest groups would be empowered and further incentivised to educate and persuade. A diffusion of influence to activists and entities can thereby accelerate positive social change.

Skewed and biased representations/reflections of intended constituencies

The mixed results of gender quotas are further compounded by Mateo Diaz's (2005) finding from various studies that "increased numbers of female representatives" frequently failed "to translate into either the improved representation of the female electorate or the improved advocacy of feminist issues". Htun (2004) concurred that their "collective presence has thus far failed to produce major shifts in policy and practice". Nevertheless, there are econometric analyses which show evidence of distinctly gender-empowering shifts in policy; Chattopadhyay and Duflo (2004) found that, in the state of West Bengal in India, women were more likely than men to complain about drinking water and roads. This translated into greater investment with respect to those concerns in their *panchayats* when there were women chairpersons (compared to male chairpersons). They found that this was also the case in the state of Rajasthan where there are distinct cultural dissimilarities, so this supports the notion that gendered shifts in policy are not solely cultural phenomena. Their findings also lend support to Dahlereup and Freidenvall's (2010) contention against "the Scandinavian notion that the introduction of quota systems is very difficult, if not impossible, if women do not have a solid power base in parliament or in the political party in question." This is because they feel that this is contradicted by the "rapid diffusion of quota measures worldwide" enabling women to participate politically "in countries at all levels of development and in various social and economic political systems...". Isaac (2005) reported that, in the state of Kerala in India, EWRs' confidence levels increased. Although this is encouraging, Kerala's high female literacy rates contrast with the rest of India, South Asia more broadly, and much of the poor, global South. Rai et al. (2006) found that the majority of EWRs in India are from lower socioeconomic strata (both in terms of education and class) whilst in Pakistan more than half of EWRs are illiterate and very few own land. However, in Bangladesh EWRs came from a better socioeconomic status than average, rural women.

Quotas currently result in skewed and biased representations/reflections of their intended constituencies. This limits the possibility and extent of descriptive representation while also limiting the potential for voters to decide upon the best candidate-qualities required to substantively represent the specificity of their interests. Through all the aspects of the proposed voting system and mechanism(s), but especially aspects 4 and 5 (outlined in the 'Methodology...' section) which explicitly enable voters to specify candidate-qualities and the interests they want represented, any bias in characteristics of elected representatives would better reflect the underlying reality of voters' preferences compared to current implementations of quotas. Mathematically speaking, this can be attributed to the voters being posed with continuous (rather than discrete) constrained optimisation problems (aspect 1).

Career incentives and voters' expectations

Legislative careers entail the *expectation* of representing all peoples' interests within their respective geospatial community because voters with diverse preferences across countries formally coalesce in legislatures based upon geospatial communities. Therefore, certain groups' interests within geospatial communities are privileged over others', and quotas do not satisfactorily accomplish the objective of substantive representation of women's interests. Htun and Jones's (2002) study showed how, in Argentina, a third of the female legislators introduced bills in the area of women's rights, and 11 percent of bills related to children and families; this illustrates that although a proportion of women actively promoted women's substantive representation, the majority did not. The authors stated that "the vast majority of women who enter politics in Latin America do not campaign on women's issues... nor do they make such issues the central focus of their legislative careers." This, amongst other problematic aspects of political careers, may be addressed through holistic voting system reform.

One problem with expecting EWRs to advocate gendered policy issues is that, within geospatially privileged conceptions of representation, constituents are most often not just female but also male and from a variety of backgrounds; the non-diverse composition may not be conducive to representing the prioritising of certain interests. EWRs risk their political careers and prospects for re-election by potentially alienating half the electorate; this partially explains why the impact of gender quotas on gender-equitable forms of political representation appear mixed. Philips (1995) suggested that women's policy agencies may be better positioned to wholly advocate women's issues since it is within their remit to do so; however, this does not confer the other advantages of having EWRs. The proposed voting system would facilitate women's policy agencies direct access to and lobbying of EWRs that have mandates to represent women's' issues whilst also learning about the interests of other coalitions that could affect the outcomes of legislature's votes but about which the agencies may not have otherwise possessed sufficient information for lobbying purposes. Through the proposed voting system reform, those EWRs elected through voter-chosen gender quotas rather than primarily geospatial-community grounds (which can be viewed as imposed 'geospatial quotas') could solely advocate women's issues and mitigate damage to their legislative careers because the electorate's preference-specifications would democratically legitimate their doing so.

Referring to findings of the distinctly gendered policy and legislative advocacy that EWRs tend to engage in (see also Pande and Ford 2012) whilst also acknowledging the problematic aspects of women having their expressive capabilities curtailed due to the prevailing patriarchy, incorporating quotas into this proposal for holistic voting system reform could (theoretically) positively impact political career incentives. It is worth re-iterating these incentive effects. Given that the proportion of seats allocated on the bases of quotas (gender, sexuality, socioeconomic background, caste, race, culture etc.) would be subject to change in every round of ongoing elections, invoking the aforementioned conceptual benefits of fluidity and flexibility that Mansbridge (2010) advocated in opposition to permanency and rigidity, male elected representatives would be under threat of losing seats through voter-chosen quotas within the reformed voting system. Through this constant tension, male elected representatives could improve the probability of holding onto their seats if they incorporated women's issues and ensured sensitivity to intersectionality to demonstrate representative credibility to heterogeneous voters. Indeed, women (and other groups in society) elected from voter-chosen quotas may never lose their seats if voters feel descriptive representation is necessary along these dimensions, and,

conversely, there would be further institutional incentive for those who hold a seat with fewer quotas attached to them to represent general interests (rather than various special interests).

Empowering voters in ways that are consistent with mainstream conceptions of democratic justice helps overcome intellectual obstacles while practically and naturally incorporating masculinities (Levant 2011; Morrell, Jewkes and Lindegger 2012; Fields et al. 2015; Cornwall and Lindisfarne 2016) into Gender and Development whilst aligning with the objective of encouraging more gender-equitable forms of political representation. Malleable systems such as the one proposed in this article would remain sensitive to changing and evolving perceptions, power structures, and contexts through incorporating fluidity and flexibility in representation by enhancing voters' preference-specification capabilities and choice.

Nevertheless, this proposal still does not directly address the deeply concerning and problematic patriarchy prevailing throughout most contemporary societies where incidences of violence, access to education, property rights, economic empowerment, social status, bodily autonomy, and so on remain deeply gendered. Incorporating quotas into broader proposals for voting system reform across representative democracies might positively permeate these domains and alleviate problems. Advocating quotas in ways that are intellectually consistent with democratic justice can win far more allies and supporters which would enable the "substantive representation" that Childs (2001) defined as the extent to which political representatives exhibit a "distinctive women's perspective and issue positions" and "act decisively on the basis" of those same perspectives and positions. Such voting systems can improve upon the current, often mixed outcomes of gender quotas. Voting systems need to be reformed so that EWRs—not just women's policy agencies—are empowered through having specified remits; I believe the voting system and mechanism(s) proposed within this article facilitates this and accounts for intersectionality.

I concur with Squires' (2007) contention that the "focus on securing gender equality in relations to the narrow institutions of parliament alone" through quotas as they are currently advocated "may well delimit wider concerns about gender equality, co-opting women into existing institutions rather than seeking to transform the nature of political engagement more profoundly." To this end, I have sought to conceptualise ways in which gender quotas can be incorporated into more holistic and democratically-just voting systems wherein empowering and equitable political representation for all can be achieved, significantly improving gender-empowering and gender-equitable representation.

Limitations, potential criticisms and potential directions for future research

This article insufficiently accounts for the state of the art in the gender quotas literature. However, engaging more thoroughly with the gender quotas literature balances against the necessity of elaborating upon the proposed voting system, including situating this article in relation to other pertinent social science literatures. Further, relevant reading on gender quotas includes Krook (2006, 2009, 2010), Krook and Norris (2014), Celis et al. (2014), Franceschet and Piscopo (2008), Franceschet, Krook and Piscopo (2012), Mastracci (2017), and Priebe (2017).

Another limitation is that the voting system and mechanism(s) will not have any effect if there is institutional inertia with respect to implementation and if voters vote 'dishonestly'. However, constructing a truthful/strategy-proof mechanism for this purpose is beyond the scope of this paper. Moreover, there are no mathematical formalisations presented in this article; a commensurate analysis and corresponding simulations of this proposed system have not been conducted.

Another criticism is that this system could lead to situations where no women (and/or other disadvantaged groups discussed) are elected. This possibility is also theoretically admitted in current voting systems but is not the case. Worst-case analysis regarding the effects upon groups of voters (in intersecting coalitions or otherwise) in this proposed system could build upon previous research into the Price of Anarchy in Algorithmic Game Theory settings (e.g. Koutsoupias and Papadimitriou 1999; Roughgarden and Tardos 2004; Kannan, Busch and Spirakis 2013; Christodoulou et al. 2016). I postulate that tailored measures of inefficiency and unfairness will be required.

This proposed mechanism does not *directly* represent the oft-marginalised interests of the disenfranchised such as animals (Singer 1973; Donovan 1990; Clark 2015), children (Jans 2004; Wall 2014; Tremmel and Wilhelm 2015), and non-nationals/immigrants (Bergh and Bjørklund 2003; Rosberg 1977); however, voters can specify that they want to use their vote to *indirectly* advance others' interests.

The dimensions of candidate-qualities and interests will likely change over time. The voting system needs to remain malleable, generalisable, and extensible to allow societies to organically change. This mechanism should enable voters to semi-autonomously implement pareto-improving system changes (i.e., each addition leaves at least one voter better off without any other voter being made worse off).

To make this research generalisable for other domains that can be characterised as voting games (e.g., employment and education), typical political/electoral voting games in democracies can be characterised as 'unweighted' (all voters have one, equal vote) whilst, in other domains, voters often have unequal weights assigned to their votes. The potential for using load-balancing games to model and simulate the outcomes of quotas is discussed briefly in the next section.

Further remarks on the potential relevance for Social Choice theory

Relating this back to Social Choice theory is crucial. As the designed voting system/mechanism(s) becomes increasingly complex, intuitive appeals to democratic justice will appear less convincing. Dealing with resource-allocation and agents' interests, this proposal and subsequent iterations will face numerous obstacles in a political reality characterised by scepticism.

Therefore, formally proving the effectiveness and fairness of these abstract voting procedures would facilitate trustworthiness. Computational Social Choice scholars (and, thus, in Algorithmic Game Theory and Economics & Computation more broadly) have significantly advanced the frontiers of Social Choice (see, for example, Brandt et al. (2016), Bartholdi III, Tovey and Trick (1989), and Roethe (2015)). Moreover, a strong tradition of using Social Choice theory persists among economists and political scientists (see, for example, Myerson (1999, 2013), Dryzek and List (2003), Pildes and Anderson (1990), Sen (1997, 1999), Maskin (1999), Reny (2001), Penn, Patty and Gailmard (2011), and Wilson (1972)). There have also been feminist philosophical interpretations and analyses of Social Choice theory (Peter 2003). One option may be to relate the properties of the proposed voting system/mechanism(s) back to the well-known and particularly profound results of Gibbard (1973), Satterthwaite (1975), and Arrow (1950, 1963). Although beyond this article's scope, I might still conjecture what such a mathematical and/or computational investigation may yield.

Conjecture

Although the Gibbard-Satterthwaite Theorem (and, therefore, Arrow's Impossibility Theorem) will certainly hold if the resulting voting mechanism(s)/system is designed so that it has a truly unrestricted domain, more than 3 candidates, and is strategy-proof, it is possible that it will only be trivially dictatorial (whether that be in a positive, scientific sense, or a normative, practical one). This could be explained by the ongoing, dynamic nature of the proposed electoral rule in conjunction with previous computational complexity results. As such, the designed voting system (which needs to be mathematically formalised and further articulated) can and should aim to 'stretch' the Gibbard-Satterthwaite Theorem and any other identified, relevant theorems to their limits (potentially both in the figurative sense and the literal, mathematical analysis sense).

The potential for and desirability of Computational Simulations

Neither mathematical analysis and investigation nor concise and descriptive language will be sufficient for persuading stakeholders of the benefits of envisioned voting systems. When proposing fundamental voting system reform (which can be applied not just to politics but also to domains such as education, employment, and healthcare, for example), alternative investigations are required to understand potential benefits.

One can use computational simulations to predict the potential outcomes of this voting system and variations of it; one way of doing this would be through implementing appropriate multi-agent systems (see, for example, Wooldridge (2009), Pitt et al. (2006), Shoham and Leyton-Brown (2009), Shehory, Sycara and Jha (1998), Elkind et al. (2009), Marcolino, Jiang and Tambe (2009), and Serrano et al. (2014)) as well as agent-based models (see, for example, Masad and Kazil (2015), Axtell (2000), Miller and Page (2007), Klügl and Bazzan (2012), Schreiber (2014), Kogut, Colomer and Belinky (2013), Fieldhouse, Lessard-Philips and Edmonds (2016), and DellaPosta, Shi and Macy (2015)).

Such simulations are beyond this paper's scope. Moreover, as one programs and runs simulations, further possible improvements to the voting system will arise. The outputs of such endeavours could reasonably constitute several distinct articles (especially when seeking to use different initial datasets or when adapting the voting system for different contexts).

Simulations also yield original, artificial data for predicting the potential impact of this hitherto untested mechanism; this would be especially useful where pre-existing, real-world data is currently insufficient for predicting impact. One possibility to consider for simulating the outcomes of voter-chosen quotas is to model them as a variation of load-balancing games (see, for example, Even-Dar, Kesselman and Mansour 2001; Koutsoupias, Panagopolou and Spirakis 2007; Aumann and Domb 2010) where the tasks not only have different weights and are divisible but also such that there are different types of tasks and each of the machines have a vector of speeds corresponding to various types of tasks.

Concluding Remarks

Quotas for women, as they are currently advocated, *can* confer significant benefits through encouraging more gender-equitable forms of political representation. However, they are both conceptually and empirically problematic. They do not necessarily lead to their intended outcomes and they legally restrict many voters' democratic choice. I have outlined an alternative conception of a holistic and democratically-just voting system that seeks to harmonise with mainstream

conceptions of democratic justice through flexible, preference-contingent and voter-chosen quotas that can advance gender empowerment more effectively, especially when compared to how quotas are currently advocated and implemented. Through voting system reform that ceases the inherent privileging of geospatial-constituency representation, (gender) quotas may win more allies through facilitating much-needed reforms in representative democracies the world over. A geospatial-constituency paradigm of representation essentially imposes ‘geographical quota’ (from the perspective of the outlined voting system); restricting representation to this mode is inherently undemocratic. The proposed voting system and mechanism(s) within this article would facilitate fluidity and flexibility in the institutionalisation of legislatures’ quotas whilst incorporating contemporary, significant, and legitimate intersectionality concerns.

Through substantive incorporation of intersectionality, the interests of various demographics, communities, and peoples with various qualities throughout societies can be represented more effectively and equitably. This includes the interests of people of various religions, races, ethnicities, sexualities, gender identities, ages, disabilities, occupations, professions, qualifications, incomes, communities, educations, socioeconomic backgrounds, ideologies etc. and even the historically disenfranchised (e.g., children and animals).

Thus, a broader class of related and interconnected political problems can be confronted through implementing the proposed voting system (not only in politics but also in other distinct contexts such as education and employment, for example). The proposed voting system inherently expands peoples’ (political) freedoms to advance or even optimise democratic and social justice. Formal mathematical analyses and/or computational simulations are necessary and desirable but beyond this paper’s scope.

Politically implementing the proposed voting system and mechanism(s), would be more practical for some countries than others for various reasons. For example, this might be more practical for democratic countries with ‘unwritten constitutions’; those with unwritten constitutions may be able to adopt this proposed voting system (or variations of it) with fewer legal hurdles than countries with codified constitutions. This could include Canada, Israel, New Zealand, and the United Kingdom. Countries with codified constitutions could still adopt the proposed voting system and mechanism(s), but I envision greater legal hurdles unless such constitutions are sufficiently and appropriately malleable.

References

- Alexander-Floyd, N. G. (2012). "Disappearing Acts: Reclaiming Intersectionality in the Social Sciences in a Post-Black Feminist Era." *Feminist Formations*, 24(1), pp.1-25.
- Arrow, K. J. (1950). "A Difficulty in the Concept of Social Welfare." *The Journal of Political Economy*, 58(4), pp.328-346.
- Arrow, K. J. (1963). *Social Choice and Individual Values*. Yale University Press.
- Ashe, J. (2017). "Women's Legislative Underrepresentation: Enough Come Forward, (Still) Too Few Chosen." *Canadian Journal of Political Science*, 50(2), pp.597-613.
- Aumann, Y., and Dombb, Y. (2010). "Pareto Efficiency and Approximate Pareto Efficiency in Routing and Load Balancing Games." In Kontogiannis, S., Koutsoupias, E., and Spirakis, P. (eds.) *Proceedings, Algorithmic Game Theory: Third International Symposium, SAGT 2010*. Athens, Greece, October 2010.
- Axtell, R. (2000). "Why Agents? On the Varied Motivations for Agent Computing in the Social Sciences." *Center on Social and Economic Dynamics*, Working Paper No. 17. Washington, DC: Brookings Institution.
- Bartholdi III, J. J., Tovey, C. A., and Trick, M. A. (1989). "The computational difficulty of manipulating an election." *Social Choice and Welfare*, 6(3), pp.227-241.
- Bergh, J., and Bjørklund, T. (2003). "The Political Representation of Immigrants in Oslo and Copenhagen: A Study of Electoral Systems and Voting Behavior." In Brochmann, G. (ed.) *Multicultural Challenge (Comparative Social Research, Volume 22)*, Emerald Group Publishing Limited, pp.101-121.
- Besley, T. (2004). "Paying politicians: theory and evidence." *Journal of the European Economic Association*, 2(2-3), pp.193-215.
- Bilge, S. (2010). "Recent Feminist Outlooks on Intersectionality." *Diogenes*, 57(1), pp.58-72.
- Bonneau, C. W., and Cann, D. M. (2015). "Party Identification and Vote Choice in Partisan and Nonpartisan Elections." *Political Behavior*, 37(1), pp.43-66.
- Braendle, T. (2015). "Does remuneration affect the discipline and selection of politicians? Evidence from pay harmonization in the European Parliament." *Public Choice*, 162(1-2), pp.1-24.
- Brah, A., and Phoenix, A. (2004). "Ain't I A Woman? Revisiting Intersectionality." *Journal of International Women's Studies*, 5(3), pp.75-86.
- Brandt, F., Conitzer, V., Endriss, U., Lang, J., and Procaccia, A. D. (2016). *Handbook of Computational Social Choice*. Cambridge University Press.
- Bryld, E. (2001). "Increasing participation in democratic institutions through decentralization: Empowering women and scheduled castes and tribes through Panchayat Raj in India." *Democratization*, 8(3), pp.149-173.
- Caul, M. (2010). "Women's Representation in Parliament: The Role of Political Parties" in Krook, M. L., and Childs, S. (eds. 2010), *Women, Gender, and Politics: A Reader*. Oxford: Oxford University Press.
- Celis, K., Childs, S., Kantola, J., and Krook, M. L. (2014). "Constituting Women's Interests through Representative Claims." *Politics & Gender*, 10, pp.149-174.
- Chan, M. Y., and Chin, F. (1993). "Schedulers for larger classes of pinwheel instances." *Algorithmica*, 9(5), pp.425-462.
- Chattopadhyay, R., and Duflo, E. (2004). "Women as policy makers: Evidence from a randomized policy experiment in India." *Econometrica*, 75(5), pp.1409-1442.
- Childs, S. (2001). "In their own words: New Labour women and the substantive

- representation of women.” *British Journal of Politics and International Relations*, 3(2), pp.173-191.
- Childs, S. (eds. 2010), *Women, Gender, and Politics: A Reader*. Oxford: Oxford University Press.
- Cho, S., Crenshaw, K. W., and McCall, L. (2013). “Toward a Field of Intersectionality Studies: Theory, Applications, and Praxis.” *Signs: Journal of Women in Culture and Society*, 38(4), pp.785-810.
- Choo, H. Y., and Ferree, M. M. (2010). “Practicing Intersectionality in Sociological Research: A Critical Analysis of Inclusions, Interactions, and Institutions of in the Study of Inequalities.” *Sociological Theory*, 28(2), pp.129-149.
- Christodoulou, G., Filos-Ratsikas, A., Stiil, S. K., Goldberg, P. W., Zhang, J., and Zhang, J. (2016). “Social Welfare in One-Sided Matching Mechanisms.” In: *Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2016)*, Thangarajah, J., Tuyls, K., Jonker, C., and Marsella (eds.), May 9-13, Singapore.
- Clark, S. R. L. (2015). “Animals, Real and Virtual.” In Kidd, I. J., and McKinnell, L. (eds.) *Science and the Self: Animals, Evolution, and Ethics*. Taylor & Francis eBooks.
- Collins, P. H. (2000). *Black Feminist Thought: Knowledge, Consciousness and the Politics of Empowerment*. New York: Routledge. 1st edition 1990.
- Collins, P. H. (1998). “It’s All in the Family: Intersections of Gender, Race, and Nation.” *Hypatia: A Journal of Feminist Philosophy*, 13(3), pp.62-82.
- Cornwall, A., and Lindisfarne, N. (2016). (eds). *Dislocating Masculinity: Comparative Ethnographies*. London and New York: Taylor & Francis.
- Craske, N. and Molyneux, M. (eds. 2002), *Gender and the Politics of Rights and Democracy in Latin America*. New York: Palgrave.
- Crenshaw, K. (1989). “Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics.” *The University of Chicago Legal Forum*, 140, pp.139-167.
- Dahlerup, D. (ed. 2006), *Women, Quotas and Politics*. London and New York: Routledge.
- Dahlerup, D., and Freidenvall, L. (2010). “Quotas as a “Fast Track” to Equal Representation for Women: Why Scandinavia Is No Longer the Model” in Krook, M. L., and Childs, S. (eds. 2010), *Women, Gender, and Politics: A Reader*. Oxford: Oxford University Press.
- Davis, K. (2008). “Intersectionality as buzzword: A sociology of science perspective on what makes a feminist theory successful.” *Feminist Theory*, 9(1), pp.67-85.
- DellaPosta, D., Shi, Y., and Macy, M. (2015). “Why Do Liberals Drink Lattes?” *American Journal of Sociology*, 120(5), pp.1473-1511.
- Deshpande, A., and Sharma, S. (2016). “Disadvantage and discrimination in self-employment: caste gaps in earnings in Indian small businesses.” *Small Business Economics*, 46(2), pp.325-346.
- Donovan, J. (1990). “Animal Rights and Feminist Theory.” *Signs: Journal of Women in Culture and Society*, 15(2), pp.350-375.
- Dryzek, J. S., and List, C. (2003). “Social Choice Theory and Deliberative Democracy: A Reconciliation.” *British Journal of Political Science*, 33(1), pp.1-28.
- Edwards, J. and McAllister, L. (2002). ‘One step forward, two steps back? Women in the two main political parties in Wales’, *Contemporary Politics*, 9(4), pp.397-414.
- Elgood, J., Vinter, L., and Williams, R. (2001). *Man Enough for the Job? A Study of Parliamentary Candidates*. London: Equal Opportunities Commission.

- Elkind, E., Goldberg, L. A., Goldberg, P. W., and Wooldridge, M. (2009). "On the computational complexity of weighted voting games." *Annals of Mathematics and Artificial Intelligence*, 56(2), pp.109-131.
- Even-Dar, E., Kesselman, A., and Mansour, Y. (2001). "Convergence Time to Nash Equilibrium in Load Balancing." *ACM Transactions on Computational Logic*, 2(3), pp.111-132.
- Everett, Jana. (2009). "Women in Local Government in India" in Goetz, A. M. (ed. 2009), *Governing Women: Women's Political Effectiveness in Contexts of Democratization and Governance Reform*. New York: Routledge.
- Ferraz, C., and Finan, F. (2009). "Motivating Politicians: The Impacts on Monetary Incentives on Quality and Performance." *National Bureau of Economic Research*, NBER Working Paper No. 14906. Cambridge, MA: National Bureau of Economic Research.
- Fieldhouse, E., Lessard-Philips, L., and Edmonds, B. (2016). "Cascade or echo chamber? A complex agent-based simulation of voter turnout." *Party Politics*, 22(2), pp.241-256.
- Fields, E. L., Bogart, L. M., Smith, K. C., Malebranche, D. J., Ellen, J., and Schuster, M. A. (2015). "I Always Felt I Had to Prove My Manhood": Homosexuality, Masculinity, Gender Role Strain, and HIV Risk Among Young Black Men Who Have Sex With Men." *American Journal of Public Health*, 105(1), pp.122-131.
- Fishburn, P. C., and Lagarias, J. C. (2002). "Pinwheel scheduling: achievable densities." *Algorithmica*, 34(1), pp.14-38.
- Franceschet, S., and Piscopo, J. M. (2008). "Gender Quotas and Women's Substantive Representation: Lessons from Argentina." *Politics & Gender*, 4(3), pp.393-425.
- Franceschet, S., Krook, M. L., and Piscopo, J. M. (eds. 2012). *The Impact of Gender Quotas*. New York, NY: Oxford University Press.
- Gașieniec, L., Klasing, R., Levkopoulos, C., Lingas, A., Min, J., Radzik, T. (2017). "Bamboo Garden Trimming Problem (Perpetual Maintenance of Machines with Different Attendance Urgency Factors)." In: Steffen, B., Baier, C., van den Brand, M., Eder, J., Hinchey, M., Margaria, T. (eds) SOFSEM 2017: *Theory and Practice of Computer Science*. SOFSEM 2017. *Lecture Notes in Computer Science*, 10139, pp.229-240.
- Gibbard, A. (1973). "Manipulation of Voting Schemes: A General Result." *Econometrica*, 41(4), pp.587-601.
- Giugăl, A., Johnston, R., Chiru, M., Ciobanu, I., and Gavriș, A. (2017). "Gerrymandering and Malapportionment, Romanian Style: The 2008 Electoral System." *East European Politics and Societies*. DOI: <https://doi.org/10.1177/0888325417711222>.
- Goetz, A. M. (ed. 2009). *Governing Women: Women's Political Effectiveness in Contexts of Democratization and Governance Reform*. New York: Routledge.
- Gohaini, M. P. (2014). "81% of northeast women harassed in Delhi: Survey." *The Times of India*, Available at: <http://timesofindia.indiatimes.com/city/delhi/81-of-northeast-women-harassed-in-Delhi-Survey/articleshow/29270244.cms>, date accessed 20 July 2017.
- Gould, E., Schieder, J., and Geier, K. (2016). "What is the gender pay gap and is it real? The complete guide to how women are paid less than men and why it can't be explained away." *Economic Policy Institute*. Washington, DC: Economic Policy Institute.
- Hall, J. C., Everett, J. E., and Hamilton-Mason, J. (2012). "Black Women Talk About Workplace Stress and How They Cope." *Journal of Black Studies*, 43(2), pp.207-226.
- Htun, M. (2004). 'Is gender like ethnicity? The political representation of identity groups'.

- Perspectives on Politics*, 2(3), pp.439-58.
- Htun, M. N. and Jones, M. P. (2002). 'Engendering the right to participate in decision-making: electoral quotas and women's leadership in Latin America' in Craske, N. and Molyneux, M. (eds. 2002), *Gender and the Politics of Rights and Democracy in Latin America*. New York: Palgrave.
- Hunt, V., Layton, D., and Prince, S. (2015). "Diversity Matters". *McKinsey & Company*.
- Hust, E. (2004). *Women's Political Representation and Empowerment in India: A Million Indiras Now?* New Delhi: Manohar.
- Isaac, T. M. T. (2005). "Women elected representatives in Kerala (1995-2000): From symbolism to empowerment." In Jain, L. C. (ed. 2005), *Decentralization and Local Governance*. New Delhi: Orient Longman.
- Issacharoff, S. (2002). "Gerrymandering and Political Cartels." *Harvard Law Review*, 116(2), pp.593-648.
- Jain, L. C. (ed. 2005). *Decentralization and Local Governance*. New Delhi: Orient Longman.
- Jans, M. (2004). "Children as Citizens: Towards a Contemporary Notion of Child Participation." *Childhood*, 11(1), pp.27-44.
- Johnston, R. (2002). "Manipulating maps and winning elections: measuring the impact of malapportionment and gerrymandering." *Political Geography*, 21(1), pp.1-31.
- Kannan, R., Busch, C., and Spirakis, P. (2013). "The Price of Anarchy is Unbounded for Congestion Games with Superpolynomial Latency Costs." arXiv:1308.4101 [cs.GT].
- Kidd, I. J., and McKinnell, L. (2015, eds.) *Science and the Self: Animals, Evolution, and Ethics*. Taylor & Francis eBooks.
- Kirkland, P., and Coppock, A. (2017). "Candidate Choice Without Party Labels: New Insights from Conjoint Survey Experiments." *Political Behavior*. First Online: 16 June 2017. DOI:10.1007/s11109-017-9414-8.
- Klügl, F., and Bazzan, A. L. C. (2012). "Agent-Based Modeling and Simulation." *AI Magazine*, 33(3), pp.29-40.
- Kogut, B., Colomer, J., and Belinky, M. (2013). "Structural equality at the top of the corporation: Mandated quotas for women directors." *Strategic Management Journal*, 35(6), pp.891-902.
- Kotakorpi, K., and Poutvaara, P. (2011). "Pay for politicians and candidate selection: An empirical analysis." *Journal of Public Economics*, 95(7-8), pp.877-885.
- Koutsoupias, E., Panagopoulou, P. N., and Spirakis, P. G. (2007). "Selfish load balancing under partial knowledge." In *Proceedings of the 32nd International Conference on Mathematical Foundations of Computer Science*, pp.609-620.
- Krook, M. L. (2009). *Quotas for Women in Politics: Gender and Candidate Selection Reform Worldwide*. New York, NY: Oxford University Press.
- Krook, M. L. (2006). "Reforming Representation: The Diffusion of Candidate Gender Quotas Worldwide." *Politics & Gender*, 2(3), pp.303-27.
- Krook, M. L. (2010). "Women's Representation in Parliament: A Qualitative Comparative Analysis." *Political Studies*, 58, pp.886-908.
- Krook, M. L., and Childs, S. (eds. 2010). *Women, Gender, and Politics: A Reader*. Oxford: Oxford University Press.
- Krook, M. L., and Norris, P. (2014). "Beyond Quotas: Strategies to Promote Gender Equality in Elected Office." *Political Studies*, 62, pp.2-20.
- Krook, M. L., and Nugent, M. K. (2016). "Intersectional institutions: Representing women

- and ethnic minorities in the British Labour Party.” *Party Politics*, 22(5), pp.620-630.
- Krook, M. L. (2017). “Violence Against Women in Politics.” *Journal of Democracy*, 28(1), pp.74-88.
- Koutsoupias, E., and Papadimitriou, C. (1999). “Worst-case equilibria.” *ACM STACS’99 Proceedings of the 16th annual conference on Theoretical aspects of computer science*, pp.404-413.
- Levant, R. F. (2011). “Research in the psychology of men and masculinity using the gender role strain paradigm as a framework.” *American Psychologist*, 66(8), pp.765-776.
- Lin, S.-S., and Lin, K. J. (1997). “A pinwheel scheduler for three distinct numbers with a tight schedulability bound.” *Algorithmica*, 19(4), pp.411-426.
- Mansbridge, J. (2010). “Should Blacks Represent Women and Women Represent Women? A Contingent “Yes”” in Krook, M. L., and Childs, S. (eds. 2010), *Women, Gender, and Politics: A Reader*. Oxford: Oxford University Press.
- Marcolino, L. S., Jiang, A. X., and Tambe, M. (2013). “Multi-Agent Team Formation: Diversity Beats Strength?” *Proceedings of the Twenty-Third International Joint Conference on Artificial Intelligence*, pp.279-285.
- Masad, D., and Kazil, J. (2015). “Mesa: An Agent-Based Modeling Framework.” *Proceedings of the 14th Python in Science Conference. (SCIPY 2015)*. pp.53-60.
- Maskin, E. (1999). “Nash Equilibrium and Welfare Optimality.” *The Review of Economic Studies*, 66(1), Special Issue: Contracts., pp.23-38.
- Mastracci, S. (2017). “The effect of women’s representation on the Global Gender Gap Index.” *International Journal of Public Sector Management*, 30(3), pp.241-254.
- Mateo Diaz, M. (2005). *Representing Women? Female Legislators in West European Parliaments*. Oxford: ECPR.
- Mathew, G. (2004). “The silent revolution.” *India Together*. Available at: <http://www.indiatogether.org/2004/may/wom-panchayat.htm>, accessed on 15 Jun 2015.
- McCall, L. (2005). “The Complexity of Intersectionality.” *Signs: Journal of Women in Culture and Society*, 30(3), pp.1771-1800.
- McCarty, N., Poole, K. T., Rosenthal, H. (2009). “Does Gerrymandering Cause Polarization?” *American Journal of Political Science*, 53(3), pp.666-680.
- McDuie-Ra, D. (2015a). “‘Is India Racist?’: Murder, Migration and Mary Kom.” *South Asia: Journal of South Asian Studies*, 38(2), pp.304-319.
- McDuie-Ra, D. (2015b). “‘Enough Racism, Enough’: Vocal Politics, Gendered Silences.” In: *Debating Race in Contemporary India*. Palgrave Pivot, London.
- Miller, J. H., and Page, S. E. (2007). *Complex Adaptive Systems: An Introduction to Computational Models of Social Life*. Princeton University Press.
- Mo, C. H. (2015). “The Consequences of Explicit and Implicit Gender Attitudes and Candidate Quality in the Calculations of Voters.” *Political Behavior*, 37(2), pp.357-395.
- Mohanty, C. T. (1991). ‘Under Western eyes: feminist scholarship and colonial discourses’, in Mohanty, C. T., Russo, A., and Torres, L. (eds. 2000). *Third World Women and the Politics of Feminism*. Indianapolis: Indiana University Press, pp.51-80.
- Mohanty, C. T., Russo, A., and Torres, L. (eds. 2000). *Third World Women and the Politics of Feminism*. Indianapolis: Indiana University Press.
- Morrell, R., Jewkes, R., and Lindegger, G. (2012). “Hegemonic Masculinity/Masculinities in South Africa.” *Men and Masculinities*, 15(1), pp.11-30.
- Myerson, R. B. (1999). “Theoretical comparison of electoral systems.” *European Economic*

- Review*, 43, pp.671-697.
- Myerson, R. B. (2013). "Fundamentals of Social Choice Theory." *Quarterly Journal of Political Science*, 8(3), pp.305-337.
- Nash, J. C. (2008). "Re-thinking Intersectionality." *Feminist Review*, 89(1), pp.1-15.
- Pande, R., and Ford, D. (2012). "Gender Quotas and Female Leadership." *World Bank*, Washington DC: World Bank. Accessed: <https://openknowledge.worldbank.org/handle/10986/9120>, date of access: 22 July 2017.
- Paul, D., and Smith, J. L. (2008). "Subtle Sexism? Examining Vote Preferences When Women Run Against Men for the Presidency." *Journal of Women, Politics & Policy*, 29(4), pp.451-476.
- Pildes, R. H., and Anderson, E. S. (1990). "Slinging Arrows at Democracy: Social Choice Theory, Value Pluralism, and Democratic Politics." *Columbia Law Review*, 90(8), pp.2121-2214.
- Penn, E. M., Patty, J. W., and Gailmard, S. (2011). "Manipulation and Single-Peakedness: A General Result." *American Journal of Political Science*, 55(2), pp.436-449.
- Peter, F. (2003). "Gender and the Foundations of Social Choice: The Role of Situated Agency." *Feminist Economics*, 9(2-3), pp.13-32.
- Pitt, J., Kamara, L., Sergot, M., and Artikis, A. (2006). "Voting in Multi-Agent Systems." *Computer Journal*, 49(2), pp.156-170.
- Priebe, J. (2017). "Political reservation and female empowerment: evidence from Maharashtra, India." *Oxford Development Studies*, <http://dx.doi.org/10.1080/13600818.2017.1298740>.
- Rai, S., Bari, F., Mahtab, N., and Mohanty, B. (2006). 'Gender quotas in the politics of empowerment – a comparative study', in Dahlerup, D. (ed. 2006), *Women, Quotas and Politics*. London and New York: Routledge.
- Reny, P. J. (2001). "Arrow's theorem and the Gibbard-Satterthwaite theorem: a unified approach." *Economics Letters*, 70(1), pp.99-105.
- Roethe, J. (2015). *Economics and Computation: An Introduction to Algorithmic Game Theory, Computational Social Choice, and Fair Division*. Springer.
- Rorabacher, J. A. (2008). "Gerrymandering, Poverty and Flooding: A Perennial Story of Bihar." *Economic and Political Weekly*, 43(7), pp.45-53.
- Rosberg, G. M. (1977). "Aliens and Equal Protection: Why Not the Right to Vote?" *Michigan Law Review*, 75(5/6), pp.1092-1136.
- Roughgarden, T., and Tardos, E. (2004). "Bounding the inefficiency of equilibria in nonatomic congestion games." *Games and Economic Behavior*, 47(2), pp.389-403.
- Satterthwaite, M. A. (1975). "Strategy-proofness and Arrow's conditions: Existence and correspondence theorems for voting procedures and social welfare functions." *Journal of Economic Theory*, 10(2), pp.187-217.
- Saward, M. (2006). "The Representative Claim." *Contemporary Political Theory*, 5, pp.297-318.
- Saward, M. (2010). *The Representative Claim*. Oxford: Oxford University Press.
- Schaffner, B. F., Streb, M., and Wright, G. (2001). "Tearns without Uniforms: The Nonpartisan Ballot in State and Local Elections." *Political Research Quarterly*, 54(1), pp.7-30.
- Schreiber, D. (2014). "The Emergence of Parties: An Agent-Based Simulation." *Political Research Quarterly*, 67(1), pp.136-151.

- Sen, A. K. (1999). "The Possibility of Social Choice." *The American Economic Review*, 89(3), pp.349-378.
- Sen, A. K. (1997). *Choice, Welfare and Measurement*. Cambridge, MA: Harvard University Press.
- Serafini, P., and Ukovich, W. (1989). "A mathematical model for periodic scheduling problems." *SIAM J. Discrete Math*, 2(4), pp.550-581.
- Serrano, E., Moncada, P., Garijo, M., and Iglesias, C. A. (2014). "Evaluating social choice techniques into intelligent environments by agent based social simulation." *Information Sciences*, 286, pp.102-124.
- Shehory, O. M., Sycara, K., and Jha, S. (1998). "Multi-agent coordination through coalition formation." In Singh, M. P., Rao, A., and Wooldridge, M. J. (eds). *Intelligent Agents IV Agent Theories, Architectures, and Languages*. ATAL 1997. Lecture Notes in Computer Science (Lecture Notes in Artificial Intelligence), vol 1365. Springer, Berlin, Heidelberg.
- Shepherd-Robinson, L. and Lovenduski, J. (2002). *Women and Candidate Selection in British Political Parties*. London: Fawcett Society.
- Shields, S. A. (2008). "Gender: An Intersectionality Perspective." *Sex Roles*, 59(5-6), pp.301-311.
- Shoham, Y., and Leyton-Brown, K. (2009). *Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations*. Cambridge University Press.
- Singer, P. (1973). "Animal Liberation." In Garner, R. (eds) *Animal Rights*. Palgrave Macmillan, London.
- Singh, C. P. (2000). "A century of constituency delimitation in India." *Political Geography*, 19(4), pp.517-532.
- Spelman, E. (1988). *Problems of Exclusion in Feminist Thought*. Boston, MA: Beacon.
- Squires, J. (2007). *The New Politics of Gender Equality*. Palgrave Macmillan.
- Tella, D. R., and Fisman, R. (2004). "Are Politicians Really Paid like Bureaucrats?" *The Journal of Law and Economics*, 47(2), pp.477-513.
- Tremmel, J., Mason, A., Godli, P., Dimitrijoski, I. (2015). (eds.) *Youth Quotas and other Efficient Forms of Youth Participation in Ageing Societies*. Springer Cham.
- Tremmel, J., and Wilhelm, J. (2015). "Democracy or Epistocracy? Age as a Criterion of Voter Eligibility." In: Tremmel, J., Mason, A., Godli, P., Dimitrijoski, I. (eds.) *Youth Quotas and other Efficient Forms of Youth Participation in Ageing Societies*. Springer Cham.
- Wall, J. (2014). "Why Children and Youth Should Have the Right to Vote: An Argument for Proxy-Claim Suffrage." *Children, Youth and Environments*, 24(1), pp.108-123.
- Wilson, R. (1972). "Social Choice Theory without the Pareto Principle." *Journal of Economic Theory*, 5(3), pp.478-486.
- Wooldridge, M. (2009). *An Introduction to MultiAgent Systems*. Wiley.
- Yuval-Davis, N. (2006). "Intersectionality and Feminist Politics." *European Journal of Women's Studies*, 13(3), pp.193-209.