Does Gender Stereotyping Affect Women at the Ballot Box?
Evidence from Local Elections in California, 1995-2013

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Abstract: Research demonstrates that many voters use gender stereotypes to evaluate candidates, but does that stereotyping affect women's electoral success? In this paper, we try to make headway in answering that question by combining a novel empirical strategy with local election data from California. Our empirical strategy relies on two key findings from the existing literature: first, that individuals are more likely to rely on stereotypes when they have less information about the candidates, and second, that the average voter in elections held concurrently with national elections has less information about local candidates than the average voter in off-cycle elections. We propose that we can therefore estimate the electoral effect of increased gender stereotyping by examining the difference in women's win rates in higher-information (off-cycle) and lower-information (on-cycle) elections—and how that difference varies by constituency and the office sought. Our preliminary results show that the effect of increased stereotyping is more negative for female candidates in mayoral races than in city council races, and also that the effect of greater stereotyping is more negative for women running in conservative cities than in more liberal cities. Thus, we conclude that there probably isn't a single, one-size-fits-all answer to the question of how gender stereotyping affects female candidates, but rather that the direction and magnitude of the effect varies across contexts.

The vast literature on women in American politics has devoted considerable attention to two questions: Do voters use gender stereotypes in evaluating candidates? And does gender stereotyping hurt (or possibly even help) female candidates at the ballot box? The answer to the first is clearly "yes": some voters tend to infer that female candidates are more liberal than men and also more compassionate and collaborative, more competent on certain issues like education, and less competent on other issues such as foreign policy (Alexander & Andersen, 1993; Eagly & Karau, 2002; Huddy & Terkildsen, 1993a and 1993b; Kahn, 1996; Sanbonmatsu, 2002). On the second question, however, research has not produced a consensus (Dolan, 2010).

If there is a dominant viewpoint in the women in politics literature, it is that once women decide to run for office, they fare as well as men—and that gender stereotyping by voters makes little to no difference to women's electoral fortunes (e.g., Burrell, 1994; Brooks, 2013; Duerst-Lahti, 1998; Newman, 1994; Seltzer, Newman, & Leighton, 1997). However, some work shows that the average female candidate is of higher quality than the average male candidate, which would suggest that men and women receiving equal average vote share is evidence of the *presence* of gender bias—not its absence (Anzia and Berry, 2011; Fulton, 2012; Milyo and Schosberg, 2000). Other work proposes that the effect of gender stereotyping depends on context, including the issues salient in the election (Lawless, 2004), the type of office being sought (Huddy & Terkildsen, 1993b), characteristics of the voters (Anzia and Berry, 2011; Bauer, 2015), and the availability and salience of party cues (Hayes, 2011; Hayes & Lawless, 2016; Lawless, 2015). As it stands, the literature does not offer a clear answer as to whether—or under what conditions—gender stereotyping harms (or helps) women at the ballot box.

One reason for the debate may be the significant methodological challenges inherent in estimating the effect of gender stereotyping on women's electoral success. While some studies

use observational data to study this question, most political science research on gender stereotyping uses survey experiments or lab experiments, for good reason: it is more straightforward to isolate theoretical effects of interest with controlled experiments. Critics of studies that use election returns to study gender bias point to omitted variable bias problems, such as the difficulty of controlling for candidate quality (e.g., Fulton, 2012). And when the researcher only has data on how people in a certain jurisdiction voted (as is the case with aggregate election returns), it is very difficult to tease out the effects of psychological processes like gender stereotyping.

That said, there are also disadvantages to the experimental approach—and advantages to using real election data. A common critique of experimental research on gender stereotyping is that unrepresentative samples and heavy-handed experimental designs can exaggerate the effects of stereotypes on voting (see, e.g., Brooks, 2013). Even the most careful experiments may not fully replicate how real voters make decisions in real elections. And given that the question of interest is whether and how gender stereotyping affects female candidates in real elections, there are advantages to using data on how people actually vote—even with the inferential challenges involved.

In this paper, we try to make headway in evaluating the effect of gender stereotyping on women's electoral success by combining a novel empirical strategy with local election data from California. Our dataset, which is built from data in the California Elections Data Archive, tracks the results of 12,907 local races featuring 53,818 candidates over a nineteen-year period, 1995 to 2013. To overcome one of the major challenges involved in studying gender stereotyping using data on election returns, we rely on two key findings from the existing literature: First, individuals are more likely to rely on stereotypes when they have less information about the

issues and candidates (e.g., Lupia, 1994). Second, the average voter in on-cycle elections (those held concurrently with national elections) has less information about local candidates and issues than the average voter in off-cycle elections (Oliver & Ha, 2007). As a theoretical baseline, if gender stereotyping has no effect on the electoral success of female candidates, a woman running in a lower-information environment (on-cycle elections) should be just as likely to win as she would in a higher-information environment (off-cycle elections). By contrast, if gender stereotyping negatively (or positively) affects female candidates, the woman should fare worse (or better) in the lower-information environment than in the higher-information environment.

What, then, should our expectations be? Rather than propose a single, one-size-fits-all answer, we survey the existing literature to develop multiple hypotheses about how the effects of increased gender stereotyping will depend on the context of the election. In our empirical analysis, we test these hypotheses by examining what happens to women's win rates in the shift from off-cycle to on-cycle elections—our proxy for increased gender stereotyping—and how the effect of that shift varies by type of race and constituency.

Our empirical results here are preliminary but reveal interesting patterns. First, consistent with our expectations, we find that the effect of increased stereotyping is *more negative* for female candidates in mayoral races than in city council races. Second, contrary to our expectation that the effect of greater gender stereotyping would be more positive for women in school board races than in city council races (because of the issues involved), we find no difference in the effect of more stereotyping across the two types of races. Finally, the effect of greater stereotyping is more negative for women running in conservative cities than in more liberal cities, especially for women running for mayor. While our future work must address some of the inferential concerns that arise from our approach and data, our findings so far suggest that

3

there isn't a single answer to the question of how gender stereotyping affects female candidates, but rather that the direction and magnitude of the effect is conditional.

Literature

Extensive research has established that some voters do employ gender stereotypes when evaluating female candidates. As with all stereotypes, we can expect their use to vary with the amount of information voters have about candidates (Ditonto, Hamilton, & Redlawsk, 2014; Lau & Redlawsk, 2001; Lupia, 1994) and voters' political sophistication (Bauer, 2015; Zaller, 1992). There is also little dispute regarding the content of these stereotypes, which tend to fall into three categories. Voters tend to perceive female candidates as more liberal than male candidates (Sanbonmatsu, 2002)—a "beliefs" stereotype. They often view female candidates as more compassionate and communitarian (Bem, 1981; Eagly & Karau, 2002) and more honest (Brooks, 2013) than male candidates—"trait" stereotypes. Female candidates are also assumed to be more competent than male candidates on so-called women's issues such as education and healthcare (an "issue competency" or "domain" stereotype), and weaker than men on issues like foreign affairs (Huddy and Terkildsen, 1993a; Sanbonmatsu, 2002).

The question, then, is whether these stereotypes affect women's ability to win elective office. In one of the most comprehensive treatments to date, Brooks (2013) concludes that the answer is no. Brooks carries out a series of well-designed experiments using hypothetical male and female candidates, asking respondents to rate the candidates on favorability and likely effectiveness in office. She finds that while voters show signs of using some classic gender stereotypes, it does not look as though stereotyping systematically affects respondents' evaluations of men and women's favorability and likely effectiveness. The conclusion, then, is that the use of stereotypes does not appear to have either a negative or a positive net effect on

female candidates' electoral chances—and that the source of women's underrepresentation in public office must lie elsewhere (such as lower political ambition, e.g., Fox and Lawless, 2010).

This conclusion aligns nicely with a different segment of the literature: one that compares the vote shares of male and female candidates in real elections to determine whether voters penalize the women. Most of these studies find that the average vote share of female candidates is no different from the average vote share of male candidates (Burrell, 1994; Brooks, 2013; Duerst-Lahti, 1998; Newman, 1994; Seltzer, Newman, & Leighton, 1997). In large part because of these studies, the conventional wisdom in the women in politics literature is that voters are *not* biased against women (e.g., Burrell, 1994; Darcy et al., 1994; Fox, 2006)—and that, by implication, gender stereotyping by voters is not having an impact on women's electability.

There is also research that challenges that conclusion, however. Fulton (2012) and Milyo and Schosberg (2000) find that once variation in candidate quality is accounted for, female candidates actually *do* receive fewer votes than male candidates. Moreover, extensive work in the field of psychology suggests that female leaders are penalized for exhibiting the masculine traits that are associated with strong leadership (Eagly and Karau, 2002; Koenig, Eagly, Mitchell, and Ristikari, 2011; Rudman and Phelan, 2008), which potentially puts female candidates at a disadvantage. Some more recent work also suggests that voters assume that men are more qualified than women—and that they penalize women because of it (Ditonto, 2017; Ditonto et al., 2014; Mo, 2015). With such divergent findings in the literature, it is difficult to draw clear conclusions about the effects of gender stereotyping on women's electability.

From a theoretical standpoint, it is not even clear that there *should* be a single, one-size-fits-all answer to the question of how gender stereotyping affects women's electoral success. A finding of no effect of gender stereotyping on women's vote share makes theoretical sense: most

group stereotypes contain a mix of positive and negative content (Fiske et al., 2002), and if gender stereotyping leads some voters to penalize women and other voters to support women, the result may be no visible effect in the aggregate. But findings of negative or even positive effects are also theoretically plausible, and the direction and magnitude of the effects may depend on the context of the election.

This theme—the conditionality of gender stereotyping effects—has not been a central one in the women in politics literature, but there are some examples of work along these lines. Focusing on the issues salient in elections, for example, Lawless (2004) finds that during wartime, voters prefer more dominant leaders, which disadvantages female candidates (see also Herrnson, Lay, and Stokes, 2003; Kahn, 1996). The findings of Huddy and Terkildsen (1993b) also suggest that stereotypes of communitarianism benefit women running for legislative office and possibly hurt women running for executive office. And a growing line of research finds that Democrats (both voters and elites) tend to be more supportive of women than Republicans (King and Matland, 2003; Kitchens and Swers, 2016), suggesting that the effect of gender stereotyping might vary by the partisan or ideological composition of the jurisdiction.

Together, these findings point in the direction of *varying* effects of gender stereotyping— some positive, some negative, and some neutral—rather than to a single, unconditional answer about how voter stereotyping affects female candidates at the polls. But hypotheses about the conditions that shape gender stereotyping effects remain underdeveloped. Moreover, for the hypotheses that have been proposed in the literature, there have been very few empirical tests— and, to our knowledge, no empirical tests of multiple hypotheses using the same data.

Empirical Strategy

Given the methodological challenges involved, how should one go about evaluating the effects of gender stereotyping on women's electoral success? Both the experimental approach and analyses of election returns have their strengths and weaknesses.

As we suggested earlier, there are good reasons why scholarship focused on stereotyping mainly relies on surveys and experiments. Stereotyping, after all, is a psychological phenomenon. It is not something one can readily measure by observing individuals' behavior. And even if we *could* observe a behavior that we understand to represent bias, individuals being observed are often reluctant to demonstrate behaviors viewed as socially undesirable. It makes sense, then, that researchers primarily study the use and effects of stereotypes through experiments: the researcher manipulates the conditions presented to respondents and then assesses how the varying information (about gender, for example) affects respondents' evaluations of a given candidate. Election returns, by comparison, provide little if any information about the psychological processes of voters. Well-designed studies comparing the vote shares of male and female candidates can uncover the extent of overall "bias" against or in favor of women (even if scholars dispute the degree to which omitted variables might explain such findings), but they cannot readily speak to the psychological processes underpinning voters' behavior.

At the same time, if our interest is in understanding the *effects* of those psychological processes on women's chances of being elected, there are considerable advantages to focusing on the stage at which citizens cast real votes. Election returns allow us to observe voters' actual choices. By contrast, in experimental work, respondents are usually presented with hypothetical candidates, and sometimes just one candidate at a time—not two or more competing candidates

from which they must choose. Therefore, while there are advantages to using experiments to assess the prevalence and content of stereotypes, if we want to evaluate the effects of stereotype usage in real elections—where it counts—there are benefits to using data on election returns, as imperfect as they may be.

We are certainly not the first to argue the advantages of incorporating observational data into the assessment of the impacts of gender stereotypes (Dolan, 2010). However, studies that use election data almost all focus on congressional and gubernatorial elections,[1] and they find that any effects of gender cues are overwhelmed by other cues—namely, political party (Hayes, 2011). This has led scholars to conclude that in today's polarized politics, gender cues matter little for women's electability (Hayes, 2011; Hayes, Lawless, and Baitinger, 2014).

Nonetheless, in most elections throughout the United States, voters cannot easily rely on party affiliation as a heuristic to decide between candidates. In state and national primary races, for example, voters are usually asked to choose from candidates of the same party. In the states that have adopted "top two" primaries, moreover, partisanship may not even be a useful cue in general elections. And in elections for the nation's nearly 90,000 local governments, candidates' party affiliations usually do not appear on the ballot—and therefore are not readily available to be used as a cue by voters. Candidate gender, by contrast, is almost always apparent to voters via candidates' first names. Therefore, it is important to study the effects of candidate gender in nonpartisan elections: because the absence of party cues may increase stereotyping, and also because research suggests that women are more likely than men to start their political careers in local races (Carroll and Sanbonmatsu, 2013).

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[1] A notable exception is Crowder-Meyer et al. (2015).

The challenge discussed above remains, however: how can one infer something about a psychological process using aggregate election returns? We propose that one way of doing this is to study voters' choices (in the aggregate) under conditions in which individuals are more or less likely to use stereotypes. Research shows that when voters know a great deal about the candidates, they are less likely to rely on heuristics generally (Popkin, 1991) and gender stereotypes in particular (McDermott, 1997; McDermott, 2005). Moreover, experimental research shows that voters with a low level of attention to politics are more likely to rely on gender stereotypes (Bauer, 2015).

Critically, the amount of information voters have about local candidates and issues varies with the timing of the elections. Voter turnout is much lower in off-cycle elections than in on-cycle elections (e.g., Hajnal, Lewis, and Louch, 2002). Not only does low turnout in off-cycle elections create opportunities for organized groups to have greater influence (Anzia, 2014), but it also means that the average voter knows more about local candidates and issues than the average voter in on-cycle elections (Oliver and Ha, 2007). And that is what we should expect. When local elections are held on the same day as national elections, many people only vote in local races because they are already at the polling place to vote in national races. In off-cycle local elections, by contrast, most of the people who participate do so *because* they have interest in the local races. It makes sense, then, that the typical voter in on-cycle local elections has less information about local candidates and issues.

By combining these two empirical findings—about stereotype use and about election timing—we can analyze differences in voters' choices in off-cycle and on-cycle local elections as a way of evaluating the effects of gender stereotypes. If a female candidate receives a lower vote share when the election is held on-cycle rather than off-cycle, that suggests that greater use

9

of gender stereotyping has a negative effect on the candidate. If she receives higher vote share in the on-cycle election, that suggests that greater gender stereotyping helped her. In sum, we can use election timing as a proxy for average voter information about the candidates—and thus their tendency to use gender stereotypes—as a way of evaluating the effects of stereotyping on females' electoral success.

Two sets of caveats are worth emphasizing at the outset. First, by making comparisons between women's win rates in off-cycle and on-cycle elections, we are attempting to draw conclusions about the effects of *more* gender stereotyping on women's electoral success. Because we do not know how much gender stereotyping occurs in the baseline condition (the higher information environments), we cannot say anything about the *base rate* of gender stereotyping. However, we can rely on the literature's findings to assume that voters will be more likely to use stereotypes in the on-cycle condition than in the off-cycle condition, and then we can compare any gap in women's electoral fortunes in the two conditions across contexts to test our hypotheses. Does more gender stereotyping have a different effect on women's win rates in executive elections than in legislative elections? Does it depend on the issues at stake in the election, particularly whether the salient issues are ones on which women are assumed to be more or less competent? And does the size and direction of the effect depend on whether the woman is running in a more conservative or more liberal constituency? These are all questions we can evaluate with data on local elections held off-cycle and on-cycle.

Second, as we discussed earlier, omitted variable bias is a central concern with any observational data analysis. Throughout our own analysis, we must be cognizant of several threats to causal inference. One is the possibility that some other difference between on- and off-cycle elections—whether within or across cities—explains variation in women's electoral

10

success. For example, off-cycle electorates tend to be older (Anzia, 2017) and less diverse racially and ethnically (Hajnal and Trounstine, 2005), and their low turnout enhances the influence of organized groups (Anzia, 2014). To the extent that these differences in the electorate alter the vote share and win rates of female versus male candidates, they would bias our results (although the direction of any bias is theoretically unclear). In addition, candidates' decisions to enter races probably depend on their expectations of winning, which we think should attenuate any effects we estimate. For example, if more women decline to run in on-cycle city council races than off-cycle city council races because they anticipate that the on-cycle electorates will be unfavorable to them, then that should reduce any difference in women's success rates in the two types of elections. In what follows, our empirical results are preliminary, but we expect to address these inference concerns more deeply in future versions of the work.

Data

To carry out the analysis, we downloaded data on local elections from the California Elections Data Archive (CEDA), which tracks the results of most local elections throughout California, including counties, municipal governments, and school districts from 1995 onward. Given that we are interested in leveraging variation in election timing, we focus on the municipal governments and school districts, because their elections are held at different times—some concurrent with national elections in November of even-numbered years, and some off-cycle. Our dataset includes all regular and special elections for city council, mayor, and school board held between 1995 and 2013. In total, this includes 53,818 candidates running in 12,907 races.

Table 1 presents the numbers of races and candidates in our dataset, broken down by the office sought. In total, there are 5,024 city council races featuring 23,105 candidates. 4,733 of the races are regular races for full terms, and 291 are for shortened terms. Of the city council races,

11

2,979 were in November of even-numbered years; the remaining 2,045 were off-cycle. Most of the city council races were contested: 4,524 of them featured more candidates running than there were seats up for election.

Not all cities in California have separately elected mayors, so there are fewer mayoral races in the dataset. As we show in Table 1, there are 963 unique mayoral races (in 169 municipal governments) and 2,592 mayoral candidates. All but 40 of the races for mayor were for regular, full terms, and again, most were competitive: 761 featured two or more candidates, and 202 were uncontested. About 2/3 of the mayoral races were held concurrently with national elections: 649 were held on-cycle, and 314 were held off-cycle.

There are almost twice as many school districts in California as there are municipal governments, and so there are far more school board elections than city council elections: 6,920 unique races featuring 28,121 candidates. Again, most of the school board races were for full terms (6,357 of them), and nearly all of them were competitive (6,694). 59 percent of the school board races in our dataset were held on-cycle, and the remaining 41% were held off-cycle.

The CEDA dataset includes rich information about the elections and candidates, including the election date; number of seats up for election; candidate names; the number of votes received by each candidate; an indicator for whether the candidate won, lost or advanced to a run-off; and whether the candidate was an incumbent or a non-incumbent. The CEDA data do not have an indicator for candidate sex or gender, however, so we used a two-step process to code it: First, we used the genderizeR package in R, which uses the first name of each candidate and U. S. Census data to generate a probability that the person is female.[2] We also had a research

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[2] Kamil Wais (2016). genderizeR: Gender Prediction Based on First Names. R package version 2. 0. 0. https: //CRAN. R-project. org/package=genderizeR.

12

assistant code all council, mayor, and school board candidates as male or female on the basis of the candidate's name and, if possible, the ballot designation (e. g. , "businesswoman"). The coding of the research assistant and the R program were the same in approximately 94% of the cases. Of the remaining 6% of the cases, 84% were coded as ambiguous by the research assistant and were assigned male or female by the R package. We therefore adopt the following coding rule for our analysis: First, using the probabilities created by the R package, we code a candidate as female if 80% or more of the people in the U. S. with that name are female, and we code a candidate as male if 20% or fewer of the people with the name are female. This allows us to code candidate gender for 96% of the city observations. For the cases that are not categorized using this rule, we use the research assistant's coding, which allows us to include an additional 2% of the cases. In all, we were able to code candidate gender for 22,657 city council candidates, 2,550 mayoral candidates, and 27,631 school board candidates.

As we show at the bottom of Table 1, the share of candidates who are women, and the share of candidates who are incumbents, varies depending on the office sought. School board elections have the highest proportion of female candidates: 41%. By comparison, 26% of the candidates for city council are women, and the number is even lower for mayoral races, where only 21% of the candidates are women. School board races also feature the highest share of incumbent candidates: 34%, compared to 26% in both city council and mayoral races.

Hypotheses and Models

With this dataset, we can devise preliminary tests of three main hypotheses—all of which are hypotheses about how the net effect of gender stereotyping will depend on the context of the election. First, we draw on research about a particular trait stereotype: that women are less well suited for executive office than the legislature. If some voters do use such a stereotype—and if

that stereotype isn't offset by other voters who think that women are *better* suited for executive than legislative office, then the effect of increased gender stereotyping on women's electoral success should be *more negative* in executive races than in legislative races. We can test this using our municipal election data by comparing women in mayoral and city council elections. Specifically, our first hypothesis is:

H1: The effect of increased gender stereotyping on women's electoral success will be more negative in mayoral races than in city council races.

Our strategy for testing this hypothesis is to examine the effect of being a woman on a candidate's electoral success under different conditions. As a baseline, in city council races, we can estimate the effect of being a woman on candidates' electoral success—and, more importantly, how that effect differs (if at all) in off-cycle and on-cycle elections. If the effect of being female is *lower* in on-cycle elections than in off-cycle elections, that would imply that greater stereotyping by voters leads to penalties for female candidates. A positive change would suggest the opposite: that as voters have less information about candidates and rely more on stereotypes, female candidates actually do better.

That, then, is the baseline. But H1 implies a comparison. As a next step, we can estimate the same effects for female candidates in mayoral elections: How does being a woman affect electoral success in off-cycle elections, and how (if at all) does that female effect change in the shift to on-cycle elections? The test of H1, then, is whether the change in the female effect when moving from an off-cycle to an on-cycle election is *lower* or *more negative* in mayoral races than in city council races.

Our second hypothesis is based on an issue competency stereotype: that women are more competent than men in policy areas like education and health and less competent in areas such as

14

crime, the economy, and foreign affairs. If some voters apply these issue competency stereotypes, then we should expect the effect of greater stereotyping to be more favorable to women in school board elections—where education is the only issue at play—than the effect in a different kind of legislative race: city council elections, where law enforcement and economic development are central issues. Therefore, Hypothesis 2 is as follows:

> *H2: The effect of increased gender stereotyping on women's electoral success*
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> *will be more positive in school board races than in city council races.*

To test H2, we employ the same empirical set-up as for H1, this time making the comparisons between city council and school board races rather than city council and mayoral races. Specifically, we estimate the change in the effect of being a woman in city council races when moving from an off-cycle to an on-cycle context, then estimate the change in women's success when moving from off-cycle to on-cycle school board races, and finally test whether the latter effect is greater, or more positive, than the former.

Our third hypothesis is rooted in a well-documented beliefs stereotype: voters are inclined to think female candidates are more liberal than male candidates. We propose that the effect of greater gender stereotyping on women's electoral success in this case should depend on whether a given electorate views liberalism favorably. Thus, we hypothesize that the effect of a lower-information electoral environment will be more negative in contexts where being liberal is perceived unfavorably than in contexts where being liberal is perceived favorably. Specifically,

> *H3: The effect of increased gender stereotyping on women's electoral success*
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> *will be more negative in conservative cities than in more liberal ones.*

To test H3, we combine our municipal election data with city-level presidential vote share data from the 2012 election: the two-party presidential vote that went to Romney, accessible through the California Secretary of State's office.

To simplify our analysis, our dependent variable throughout is a binary indicator for whether candidate *i* won the election. (If a candidate in a given race advanced to a runoff, we exclude that observation from our analysis.) We use linear probability models (LPM) rather than logistic regression because LPM allows us to estimate marginal effects without calculating probabilities. For testing H1, then, our model is as follows:

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\begin{aligned}
Win_{ijk} = \beta_0 &+ \beta_1 Female_{ijk} + \beta_2 Oncycle_{jk} + \beta_3(Female_{ijk} \times Oncycle_{jk}) + \beta_4 Mayor_{jk} \\
&+ \beta_5(Female_{ijk} \times Mayor_{jk}) + \beta_6(Oncycle_{jk} \times Mayor_{jk}) + \beta_7(Female_{ijk} \\
&\times Mayor_{jk} \times Oncycle_{jk}) + \beta_8 Competition_{jk} + \beta_9 Incumbents_{jk} + \alpha_k + \varepsilon_{ijk}
\end{aligned}
$$

Subscript *i* denotes the candidate, *j* denotes the race, and *k* denotes the jurisdiction. *Female* and *On-cycle* are described above, and *Mayor* equals 1 if race *j* in city *k* is a mayoral election and 0 if it is a city council election. The variable *Competition* equals the number of candidates running in the race divided by the number of seats up for election in the race (where number of seats is usually greater than one in at-large city council races). We expect greater competition to lower the probability that a candidate will win. We run models with and without city fixed effects (α_k), but when they are included, they partial out the effects of any time-constant city characteristics that are correlated with city election timing, the type of candidates who run for office, competitiveness, and the like. These models put the focus on within-city variation—and shed

16

light on differences in the experiences of female candidates running for city council and mayor within the same city.[3] We cluster the standard errors by city.

Incumbents is a race-level characteristic and deserves explanation. For two main reasons, we limit our analysis to non-incumbent candidates. First, our empirical strategy is premised on the empirical finding that voters have less information about the candidates and issues in on-cycle local elections—and it is not clear that holds to the same degree for incumbents. After all, incumbents have already been in public office and are probably recognizable to many voters, even in on-cycle elections. Second, incumbency is a strong cue to voters (e.g., Darcy and Choike, 1986)—one that candidates very often signal through their ballot designation. The presence of this competing cue probably decreases voters' reliance on gender stereotypes. Therefore, in our analysis of the effects of greater stereotyping across contexts, it makes sense to focus on non-incumbents, for whom voters are more likely to use such stereotypes. However, the electoral success of any non-incumbent candidate will almost certainly depend on whether there is an incumbent (or incumbents) running in the same race. Therefore, *Incumbents* equals the number of incumbents running in the race divided by the number of seats for the election. We expect the coefficient on *Incumbents* to be negative.

Because our model includes all interactions of *Female*, *On-cycle*, and *Mayor*, it is worth discussing how to interpret coefficients β_1 through β_7 as well as what to look for in the test of H1. Most straightforwardly, β_1 can be interpreted as the effect of being a woman on the likelihood of winning in off-cycle city council races (i.e., where *On-cycle* and *Mayor* equal 0). β_2, then, shows us the average difference in win rates for male candidates running in on-cycle

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[3] This allows us to go beyond Palmer and Simon's (2010) description of "women-friendly" districts to see how women fare at different times within a particular jurisdiction.

races versus off-cycle races, and β_3 can be interpreted as the change in the effect of being a woman when moving from an off-cycle to an on-cycle election. Thus, β_3 is what we are referring to as the effect of more stereotyping on women's win rates in city council races: When electorates are composed of voters with less information on average, does the effect of being female on win rates increase, decrease, or stay the same? We can then estimate the same quantities for mayoral races: $\beta_1 + \beta_5$ is the effect of being a woman in off-cycle mayoral races, $\beta_1 + \beta_3 + \beta_5 + \beta_7$ is the effect of being a woman in an on-cycle mayoral race, and therefore the change in the effect of being a female when moving from an off-cycle to an on-cycle race is $\beta_3 + \beta_7$. That means that the *difference* between the effect of more stereotyping in city council races and mayoral races is simply β_7—the coefficient on the triple interaction term. Specifically, if $\beta_7 < 0$, that would support H1. If $\beta_7 \geq 0$, that would be evidence against H1.

We start by estimating the model without city fixed effects. The coefficient estimates and standard errors are presented in column 1 of Table 2. The coefficient on *Female* is positive and statistically significant, suggesting that in the average off-cycle city council race, being a female candidate is associated with a slightly higher probability of winning—about 2.6%. That female advantage grows somewhat in the shift to on-cycle city council elections: the coefficient on the interaction of *Female* and *On-cycle* is positive, although it is not significant at the 10% level (p=0.137). Interestingly, β_5 is not statistically distinguishable from zero, suggesting that the effect of being female is not significantly different in off-cycle city council and mayoral races. But when we add together β_1 and β_5, as we do at the bottom of column 1, we find that being a woman in off-cycle mayoral races actually has no significant effect on the likelihood of winning. Furthermore, when we examine the effect of being a woman in on-cycle mayoral races, also shown at the bottom of column 1, we find a *negative* effect, significant at the 10% level. Thus, it

appears that women have an advantage in California city council races but have a disadvantage in running for mayor in on-cycle elections.

Continuing with the interpretation of the coefficients in column 1 in Table 2, we find that the change in the effect of being a woman in mayoral races when moving from off- to on-cycle elections ($Female \times Oncycle + Female \times Mayor \times Oncycle$) is -0.046, but statistically insignificant. Still, for the test of H1, we should look to the coefficient on the triple interaction term. And in a one-tailed test (which is appropriate since this is a one-sided hypothesis), that coefficient is negative and significant at $p< 0.10$. This means that the effect of the low-information environment—and more stereotyping—on women's probability of winning is about 7 percentage points smaller for the average mayoral race than the average city council race. Our findings here are therefore supportive of H1.

In column 2 of Table 2, we add city fixed effects, and our findings are substantively the same. Here, we find a significant increase in the female advantage in city council races when the context shifts from a higher- to a lower-information setting. Again, this female advantage does not appear to hold in mayoral elections—and in on-cycle mayoral elections, it looks as though being female may even come with penalties. Most importantly for testing H1, however, the coefficient on β_7 is still negative and significant at the 10% level, suggesting that the effect of more gender stereotyping is more negative for women in mayoral races than in council races.

Next, we consider whether it makes sense to limit the analysis to competitive races with both male and female candidates running. One could argue that voters cannot easily rely on gender stereotypes to decide among candidates if all candidates are of the same gender,[4] so

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[4] That said, we think it possible that candidates of the same sex could provide more or fewer feminine cues, such as through ballot designations (e.g., "attorney/mother" vs. "attorney".)

perhaps we should focus on races in which voters could plausibly use gender as a cue. However, a closer look at the distribution of mixed-sex races across office types and election timing gives us pause. In particular, we find that for city council races, a larger share of the on-cycle races are mixed-sex races than the off-cycle races: specifically, 61% of the off-cycle council races are mixed-sex races, whereas 68% of the on-cycle races are mixed-sex. By contrast, in mayoral races, a *smaller* share of the on-cycle races are mixed-sex races than the off-cycle races: 41% of off-cycle mayoral contests are mixed-sex, but only 35% of the on-cycle mayoral races are. It is possible that this points to strategic entry by female candidates in *anticipation* of the differential effect of more gender stereotyping: Perhaps more women enter on-cycle council races than off-cycle council races because they expect that the larger, less-informed electorate will tend to favor them. And perhaps potential female candidates also know that larger, less-informed electorates will be more challenging for them in mayoral races. By itself, that would be a pattern supportive of H1. But it also suggests that by limiting our model to mixed-sex races, we reduce our ability to detect a difference in the effect of more gender stereotyping across contexts.

Even so, for the sake of evaluating the robustness of our results, we estimate the same model as in column 1, this time limiting the sample to mixed-sex races that have more candidates running than open seats. As we show in column 3, we lose about a quarter of the observations when we do this. We still find evidence of a female advantage in off-cycle council elections, and we still find a weak positive effect for women in the shift to on-cycle council elections (not significant). As before, we also find that the effect of being a woman diminishes the probability of winning in mayoral elections, especially for mayoral elections held on-cycle. Our test of H1, however, is based on the coefficient on the triple interaction term, and that coefficient is statistically insignificant.

To summarize our findings so far, then, we do find evidence supportive of H1, although our results depend on whether we limit the model to competitive races featuring both male and female candidates. We suspect that strategic candidate entry is contributing to the attenuation of the main coefficient of interest in column 3, and the distribution of mixed-sex races across office types and election timing is consistent with that. However, because we cannot test for strategic entry effects, we consider these results preliminary and tentative.

Next, we turn to H2: a test of whether the effect of increased stereotyping is larger (or more positive) in school board races than in city council races. Our approach is the same as before, except that now we use the sample of city council and school board races, and we replace the *Mayor* indicator with *School*—an indicator that equals 1 if the candidate is running in a school board race and 0 if she is running in a city council race. In addition, because we are now comparing races in two different sets of jurisdictions—municipal governments and school districts—we do not include city fixed effects. We also cluster standard errors by county to account for possible autocorrelation in the errors within counties.

The estimates of the model that includes all non-incumbents running in council and school board races are shown in column 1 of Table 3. As before, we find that there is a slight advantage for female candidates in off-cycle city council races and that the advantage may grow in the shift to on-cycle elections (although the coefficient on *Female × On-cycle* is insignificant at the 10% level). Interestingly, we find that female non-incumbents win at significantly higher rates in school board elections than in city council elections: the coefficient on *Female × School* is 0.038, statistically significant at the 10% level. However, we do not find that the shift from off-cycle to on-cycle school board elections—and thus a shift to a lower-information environment—leads to significantly greater advantages for female school board candidates (see

the combined coefficient on *Female × On-cycle + Female × On-cycle × School* at the bottom of column 1). Moreover, the coefficient on the triple interaction term is statistically insignificant. Thus, contrary to H2, the results here do not suggest that the effect of greater stereotyping is more positive for school board races than for city council races.

In column 2 of Table 3, we drop uncompetitive races and races that only have candidates of a single sex, and our estimates are substantively the same. Female non-incumbents do win at higher rates than male non-incumbents in both city council and school board elections, and the female effect on win rates is greater for school boards than for city council races. However, our focus is on whether the female advantage *grows* in the shift to a lower-information environment, and also on whether that growth is greater in school board elections than in city council elections. And from the evidence presented in Table 2, the answer to both of those is no. The coefficient on the interaction of *Female* and *On-cycle* is statistically insignificant, as is the coefficient on the triple interaction term. Our data are therefore not supportive of H2: It does not look as though the effect of more stereotyping is greater in school board elections than in city council elections.

Finally, we turn to our third hypothesis, which is that due to beliefs stereotypes that female candidates are more liberal, the effect of more gender stereotyping on women's electoral success will be more negative in conservative constituencies than in liberal constituencies. We focus here on city-level races because we have a measure of conservatism—Republican two-party vote share from the 2012 presidential election—at the city level. (We do not have presidential vote share at the school district level.) We test H3 for each type of race separately—city council races and mayoral races—to explore whether the potential effects of this stereotype vary across contexts. We center Republican presidential vote share around its average—0.384—

so that the coefficients on *Female* and *Female × On-cycle* represent the effect of being female in cities with average Republican presidential vote share.

Table 4 presents the coefficient estimates. We start with a model of city council candidates without city fixed effects. The coefficients on *Female* and *Female × On-cycle* show that in a city with average Republican vote share, female candidates fare somewhat better than male candidates in off-cycle council elections, and also that the effect of being female more than doubles when council elections are shifted to on-cycle. What, then, of cities that are more Republican than the average city? The coefficient on *Female × Republican vote* is negative but statistically insignificant, indicating that there is no clear difference in female council candidates' electoral fortunes in more Republican cities holding off-cycle elections. Nor is the effect of the shift to on-cycle elections significantly different from the effect for more liberal cities: the coefficient on the triple interaction term is negative but not significant at the 10% level. Therefore, for city council races, we do not see clear evidence that the effect of a shift to a lower-information environment is more negative in Republican cities than in Democratic cities. The same is true in column 2, where we add city fixed effects,[5] and in column 3, where we limit the estimation to candidates running in competitive, mixed-sex races. There is an advantage for women in city council races—one that grows in the shift to lower-information environments—but that advantage does not change significantly depending on the conservatism of the city.

In columns 4-6, however, we estimate the same models for mayoral candidates, and our conclusions are very different. We start in column 4 with the full sample and no city fixed effects. There, we find that in cities with off-cycle elections and average Republican presidential

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[5] We exclude *Republican vote* here because it is constant within cities, although we can still include its interactions with *On-cycle* and *Female* because those variables can vary within cities.

vote share, there is no effect of being a woman on the likelihood of winning. Strikingly, however, we find that the effect of being a woman in on-cycle city council races in these cities is *negative*—and significant at the 10% level (see the bottom of column 4). On average, the effect of being a female candidate in a mayoral race is a 5.9 percentage point reduction in the likelihood of winning. Moreover, the change in the effect of being a woman resulting from the shift from off-cycle to on-cycle elections is negative (p=0.102). Thus, even in cities with average partisanship, there is evidence that the shift to a lower-information environment generates penalties for female non-incumbents running for mayor.

What about women's win rates in more conservative cities? At the bottom of Table 4, we combine coefficients to show the effect of being female in more Republican cities—specifically, cities with one standard deviation more Republican presidential vote share (16 percentage points more, or cities with about 54% Republican vote share in 2012). There, we can see that for these more conservative cities with off-cycle elections, there is no significant advantage or disadvantage of being a female candidate (although the coefficient is positive). In on-cycle elections, the female effect turns negative (-0.092), although still shy of significance at the 10% level (p=0.125). However, we are especially interested the effect of shifting from an off-cycle to an on-cycle mayoral election in these more conservative cities, and that effect is shown by *Female × On-cycle + Female × On-cycle × Republican vote*. At the bottom of the table, we estimate that the effect of the shift to a lower-information environment in these cities and races is negative and statistically significant, suggesting that more gender stereotyping hurts female candidates running for mayor in more conservative cities. Furthermore, the test of H3 is based on the coefficient on the triple interaction term, and that coefficient is strong and negative, significant at the 5% level. This means that the shift from an off-cycle to an on-cycle mayoral

election has a more negative effect on women's win rates in more conservative cities than in cities with average Republican vote share.

In column 5 of Table 4, we include city fixed effects, and we find the same patterns. Strikingly, moreover, when we limit the analysis to competitive, mixed-sex races—which by our logic should attenuate the effects—we still find a significant, negative difference between the effect of more gender stereotyping on female win rates in more and less conservative cities. This, then, is a robust result: to the extent that women encounter more gender stereotyping in elections for executive offices, the likely effect of that stereotyping on their electoral success in more conservative cities is negative.

Discussion

This empirical analysis is preliminary, and there is more to be done before we can make broad assessments about the conditions under which gender stereotyping helps or hurts (or has no effect on) women's success at the ballot box.

First, in future empirical work, we will attempt to evaluate whether variation in candidate quality by candidate sex is affecting our estimates. One of the main critiques of research that uses electoral returns to demonstrate the presence or absence of gender bias is that it is difficult to account for the effects of candidate quality (e.g., Anzia and Berry, 2011; Fulton, 2012). All else equal, we should expect a higher quality candidate to win greater vote share. Thus, potential differences between the average quality of male and female candidates in our analysis may explain some of our estimated effects of being a woman on win rates. To address this concern, we have started collecting survey data on how citizens evaluate candidates' ballot designations, and we intend to use those evaluations as a measure of quality for many of the candidates in our dataset. By including this measure in our models, we will assess whether variation in candidate

quality explains some of the difference in men and women's win rates, and we can also test whether the returns to candidate quality are different for male and female candidates.

Second, we plan to evaluate whether patterns of strategic candidate entry are reducing our ability to detect effects of greater gender stereotyping by voters. As we discussed earlier, the number of women running for office appears to depend on the office sought and on the timing of the election. Moreover, the patterns we observe in the data are consistent with an account in which women are more likely to run in contexts more favorable to them. If women are more likely to run in on-cycle than off-cycle city council elections in anticipation of the effects of stereotyping, and similarly are less likely to run in on-cycle than off-cycle mayoral elections, that would reduce our ability to detect a difference between the effects in the two contexts. Our measure of candidate quality will help us evaluate this possibility to some extent: for example, we can compare the quality of female candidates in mayoral and council elections and in on-cycle and off-cycle elections. For the time being, we note that the patterns we observe in our electoral data are consistent with this account, and that it is reasonable to expect that our estimates here are smaller because of strategic candidate entry.

Third, our future work will evaluate whether other differences in on-cycle and off-cycle electorates—not just differences in the prevalence of stereotyping—might account for differences in women's electoral success. A growing body of work shows that there are indeed differences in the electorates of on- and off-cycle elections. Anzia (2014), for example, shows that the low turnout of off-cycle elections increases the electoral influence of organized groups. Importantly, though, she argues that the overall effect of increased group influence in off-cycle elections should depend on the nature of group activity and competition in a polity—and we do not see any *a priori* reason for why this effect should disproportionately favor or disfavor female

26

candidates. That said, Anzia does show evidence that teacher unions are advantaged in the average off-cycle school board election, and that municipal employee unions benefit from off-cycle city elections. Again, it is not clear whether this pattern would affect the win rates of female candidates, but in future work, we will examine patterns of candidate endorsements by these groups to evaluate whether they are more or less likely to support women.

Along the same lines, off-cycle electorates tend to be older (Anzia, 2017) and less racially and ethnically diverse (Hajnal and Trounstine, 2005) than on-cycle electorates. To the extent that younger and more diverse electorates are more inclined to elect female candidates, it might explain some of the positive effects of the shift to on-cycle election timing for women running in city council and school board races. But we are hard-pressed to come up with an explanation for how this could account for the opposite pattern for women running in mayoral races—especially in more conservative constituencies. Thus, while we certainly recognize that off-cycle and on-cycle electorates differ in ways other than the amount of stereotyping by voters, we have little reason to think that those differences can explain our preliminary findings.

In sum, we propose that our empirical strategy offers a credible way of testing the effects of gender stereotyping on women's electoral success. The literature features a great deal of work on gender stereotyping, but to the extent we want to know about the effects of stereotyping in real elections, there are advantages to analyzing real election data. The challenge up to this point has been the difficulty of studying psychological processes like stereotyping using aggregate data on how people voted. We have developed a strategy for doing that. In addition, we have proposed that the effects of greater stereotyping on women's win rates should vary by context. Our evidence supports this expectation and suggests that there isn't a one-size-fits-all answer to the question of how women are affected by gender stereotyping by voters. Instead, the answer is

conditional: the effect of greater stereotyping is more negative for women running in executive

races than in legislative races, especially in more conservative constituencies.

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Table 1: Numbers of races and candidates

	All Offices	City Council	Mayor	School Board
Number of races	12,907	5,024	963	6,920
Full term	12,013	4,733	923	6,357
On-cycle	7,762	2,979	649	4,134
Contested	11,979	4,524	761	6,694
With gender coded	12,841	5,021	961	6,859
Number of candidates	53,818	23,105	2,592	28,121
Incumbents	16,279	6,017	663	9,599
With gender coded	52,838	22,657	2,550	27,631
Female	17,855	5,886	524	11,445
Female non-incumbents	11,786	4,185	401	7,200

Table 2: Women in city council and mayoral elections

	(1)	(2)	(3)
Female	0.026	0.025	0.031
	(0.013)	(0.014)	(0.015)
On-cycle	0.009	0.027	0.01
	(0.009)	(0.012)	(0.009)
Female × On-cycle	0.027	0.031	0.028
	(0.018)	(0.019)	(0.020)
Mayor	0.066	0.047	0.082
	(0.024)	(0.017)	(0.033)
Female × Mayor	-0.035	-0.028	-0.062
	(0.037)	(0.035)	(0.043)
On-cycle × Mayor	-0.068	-0.044	-0.089
	(0.027)	(0.020)	(0.039)
Female × On-cycle × Mayor	-0.073	-0.079	-0.054
	(0.049)	(0.049)	(0.061)
Competition	-0.066	-0.056	-0.056
	(0.005)	(0.005)	(0.005)
Incumbents	-0.226	-0.223	-0.194
	(0.008)	(0.007)	(0.007)
Constant	0.592		0.53
	(0.019)		(0.018)
City fixed effects?	No	Yes	No
R-squared	0.10	0.14	0.08
Observations	18,323	18,323	13,849
Female + (Female × On-cycle)	0.053	0.056	0.059
	(0.012)	(0.012)	(0.013)
Female + (Female × Mayor)	-0.009	-0.003	-0.032
	(0.038)	(0.036)	(0.043)
Female + (Female × On-cycle) +	-0.056	-0.051	-0.057
(Female × Mayor) + (Female × On-Cycle × Mayor)	(0.032)	(0.033)	(0.041)
(Female × On-cycle) +	-0.046	-0.048	-0.025
(Female × On-cycle × Mayor)	(0.049)	(0.048)	(0.060)

Notes: Standard errors clustered by city in parentheses. Dependent variable =1 if candidate won and =0 if candidate lost.

Table 3: Women in city council and school board races

	(1)	(2)
Female	0.024	0.025
	(0.012)	(0.014)
On-cycle	-0.001	-0.001
	(0.011)	(0.011)
Female × On-cycle	0.026	0.028
	(0.020)	(0.022)
School board	0.025	0.03
	(0.010)	(0.012)
Female × School board	0.038	0.045
	(0.020)	(0.022)
On-cycle × School board	-0.019	-0.017
	(0.013)	(0.015)
Female × On-cycle × School board	-0.006	-0.007
	(0.027)	(0.030)
Competition	-0.088	-0.078
	(0.008)	(0.007)
Incumbents	-0.228	-0.211
	(0.009)	(0.009)
Constant	0.666	0.619
	(0.026)	(0.023)
R-squared	0.10	0.09
Observations	34,574	28,028
Female + (Female × On-cycle)	0.050	0.053
	(0.014)	(0.015)
Female + (Female × School)	0.062	0.069
	(0.011)	(0.012)
Female + (Female × On-cycle) +	0.082	0.091
(Female × School) + (Female × On-cycle × School)	(0.016)	(0.018)
(Female × On-cycle) +	0.020	0.021
(Female × On-cycle × School)	(0.019)	(0.021)

Notes: Standard errors clustered by county in parentheses.

Table 4: Women in city races, by city Republican presidential vote share

	City council races			Mayoral races		
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.024	0.023	0.027	0.039	0.036	0.06
	(0.014)	(0.014)	(0.015)	(0.049)	(0.055)	(0.058)
On-cycle	0.003	0.021	0.004	0.035	0.03	0.04
	(0.008)	(0.013)	(0.009)	(0.022)	(0.044)	(0.033)
Female × On-cycle	0.032	0.038	0.035	-0.098	-0.087	-0.114
	(0.018)	(0.019)	(0.020)	(0.060)	(0.069)	(0.074)
Republican vote	0.037		0.02	-0.251		-0.141
	(0.047)		(0.051)	(0.104)		(0.108)
Female × Republican vote	-0.016	-0.02	-0.023	0.41	0.356	0.43
	(0.091)	(0.098)	(0.105)	(0.274)	(0.286)	(0.304)
On-cycle × Republican vote	-0.007	-0.063	0.015	0.36	0.16	0.296
	(0.059)	(0.077)	(0.062)	(0.145)	(0.223)	(0.170)
Female × On-cycle × Republican vote	-0.142	-0.162	-0.131	-0.613	-0.612	-0.644
	(0.121)	(0.127)	(0.134)	(0.343)	(0.374)	(0.406)
Competition	-0.074	-0.062	-0.063	-0.04	-0.046	-0.029
	(0.007)	(0.007)	(0.006)	(0.005)	(0.006)	(0.005)
Incumbents	-0.23	-0.226	-0.199	-0.219	-0.229	-0.177
	(0.008)	(0.008)	(0.008)	(0.015)	(0.019)	(0.016)
Constant	0.624		0.557	0.475		0.383
	(0.021)		(0.020)	(0.035)		(0.040)
City fixed effects?	No	Yes	No	No	Yes	No
R-squared	0.1	0.13	0.08	0.15	0.22	0.12
Observations	16,352	16,352	12,680	1,847	1,847	1,047
Female effect, on-cycle, average partisanship	0.056	0.061	0.062	-0.059	-0.05	-0.054
	(0.012)	(0.012)	(0.013)	(0.033)	(0.040)	(0.045)
Female effect, off-cycle, Republican cities	0.022	0.02	0.023	0.105	0.093	0.129
	(0.022)	(0.023)	(0.025)	(0.086)	(0.094)	(0.100)
Female effect, on-cycle, Republican cities	0.03	0.031	0.037	-0.092	-0.091	-0.089
	(0.015)	(0.015)	(0.016)	(0.059)	(0.072)	(0.081)
Change in female effect, Republican cities	0.009	0.012	0.014	-0.196	-0.184	-0.217
	(0.027)	(0.029)	(0.030)	(0.103)	(0.117)	(0.128)

Notes: Standard errors clustered by city in parentheses.