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Abstract

Elected officials tend to be older than most of the constituents they represent. Is this because voters generally prefer older politicians over younger ones? We investigate this question by conducting two novel survey experiments in Japan where we ask respondents to evaluate the photos of hypothetical candidates for mayor, and then alter candidate faces using artificial neural networks to make them appear as if they are younger or older, while keeping their facial structure and contours intact. Contrary to the observed candidate pool for mayors, the voters in our experiments disliked elderly candidates the most, but viewed younger candidates as equally favorable as middle-aged candidates. We also find that younger and middle-aged voters view candidates from their age group more favorably than others, whereas older voters do not, and that all voters use age as a heuristic for a candidate's issue emphases and traits. We then provide evidence for the external validity of our results using new data on actual mayoral elections. Together, these findings suggest that it is supply-side factors rather than voter demand that explain the shortage of younger politicians in public office.

Keywords: Elections, Voting Behavior, Public Opinion, Survey Experiment
JEL classification: D72, D91

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Candidates for political office vary significantly in age—some are young, some middle-aged, some elderly—but in most countries, elected officials tend to be older than most of the constituents they represent. Over half of the world's eligible voters are under 40 years old, compared to just 15% of national legislators (Inter-Parliamentary Union 2018). This age bias is not limited to national institutions. In Japan, people under 40 comprise a third of the voting age population but occupy less than 10% of the elected positions at any level of government, from just 6% of municipal assembly members and 2% of mayors to 7% of members of the House of Representatives.[1]

Recently, scholars have begun to pay more attention to the age bias of political institutions. One body of research discusses how the under-representation of younger people in public office raises concerns about inter-generational equity (Bidadanure 2015; González-Ricoy and Gosseries 2016). Others provide evidence that just as the shortage of women or racial and ethnic minorities in office can affect policy outcomes on issues related to gender and race (e.g., Chattopadhyay and Duflo 2004; Franck and Rainer 2012), so too can the relative absence of younger politicians have consequences for age-related government spending and social welfare programs (Alesina, Cassidy and Troiano 2019; McClean 2020; Curry and Haydon 2018). Additionally, there is some evidence that gerontocracy can even discourage younger people from participating in elections (Pomante and Schraufnagel 2015).

While studies of the causes of government by the elderly are relatively nascent, to date most research on the topic has focused on supply-side explanations. In the U.S. context, two recent books suggest that younger people have less ambition to become politicians because they feel alienated from contemporary politics, view elected officials as corrupt, dishonest, and inefficient, and believe that they can best enact change in their communities through other means (Lawless and Fox 2015; Shames 2017). A handful of cross-national studies, on the other hand, point to political institutions such as candidate-centered electoral systems and minimum age requirements as the main culprits by restricting the ability of people to

[1]Calculated using the ages of politicians at the time of their election. Japanese House of Representatives Elections Dataset (Smith and Reed 2018); Japanese Municipal Elections Dataset (McClean 2020).

run for office at a younger age (Joshi 2013; Stockemer and Sundstrom 2018).

In this article, we test a separate, demand-side explanation: that voters prefer older politicians over younger representatives. We assess two channels though which age discrimination could result in the under-representation of younger people in political institutions. One possibility is that there exists a consensus among voters that younger candidates are simply too inexperienced or not competent enough to hold public office. Another, not mutually exclusive explanation is that voters prefer candidates closer to themselves in age, but since younger citizens turn out to vote at lower rates than older people, the end result is that younger candidates fare poorly in elections relative to older candidates.

In the second part of the paper, we consider two mechanisms that could account for age-based discrimination in elections. The first is that voters infer information about a candidate based on their age, from the policy issues the candidate will emphasize to the traits they will exemplify in office, and that voters judge candidates based on these inferred characteristics, whether they are right or wrong. In the economics literature, this perceived link between a candidate's ascriptive characteristics and their type is referred to as "statistical discrimination" (Phelps 1972; Arrow 1973). The second mechanism that we explore is known as "taste-based discrimination," wherein voters may harbor negative prejudices about the efficacy of certain groups as politicians, such as younger people, without any particular rational explanation (Becker 1957).

To test for age biases and their mechanisms, we conduct two novel survey experiments in Japan where we ask respondents to evaluate the photos of hypothetical candidates for mayor, while at the same time we alter candidate faces using artificial intelligence to make them appear as if they are younger or older. By taking advantage of recent advances in machine learning and neural networks, we are able to hold constant elements of each photo unrelated to aging—including the expression, underlying facial structure, and clothing of candidates—and manipulate only those elements that tend to change with age. In the first experiment, we randomly assign respondents to view two candidate photos and then ask

who they would vote for and whether they would turn out if these two candidates appeared on the ballot. In the second, we present voters with individual candidate photos and ask them to assess each candidate's likely issue emphases, traits, physical attractiveness, and electability.

Contrary to the observed under-representation of young people, we find that voters dislike older candidates the most. Respondents were significantly less likely to say that they would be willing to turn out or vote for older candidates, but were equally likely to support younger and middle-aged candidates. This elderly bias was also reflected in our tests for in-group favoritism: while younger and middle-aged voters were modestly more favorable toward candidates from their age group compared to others, older voters were if anything more critical of elderly candidates. We then test the external validity of our findings using newly collected data on actual mayoral elections in Japan, and show that turnout is indeed lower when candidates are much older and that older candidates tend to receive fewer votes than younger candidates.

In our second experiment, we find support for both statistical and tasted-based mechanisms of age discrimination. Respondents in our surveys drew clear links between a candidate's age and their issue emphases and traits. Voters believed that candidates would devote relatively more attention to issues important to their age group: younger candidates were thought to focus more on education and childcare, middle-aged candidates more on the economy, and older candidates more on elderly care and healthcare. Middle-aged candidates were seen as generally having the most favorable traits for office, whereas younger candidates were viewed as the most physically attractive. In our subsequent tests, we find evidence that inferred judgments about a candidate's issues and traits are predictive of a voter's support for a given candidate (statistical discrimination), but that voters still significantly disliked older candidates even when controlling for these other factors (taste-based discrimination).

In sum, we find little evidence that voter biases are to blame for youth under-representation in office. Voters in our experiments were equally willing to support younger candidates as

middle-aged candidates, and preferred younger candidates substantially more than older candidates. Our findings thus support the idea that it is supply-side factors such as political ambition and institutions that most inhibit young people from becoming politicians. If institutions can be reformed and young people encouraged to run, our results suggest that voters will welcome their greater presence in public office.

Voter Biases and the Age of Politicians

To date, research on the informational shortcuts that voters rely on when they evaluate politicians has largely ignored age. When evaluating a candidate, we know that voters make inferences about their likely policies and effectiveness in office based on a wide range of heuristics, from those more directly connected to politics, such as a candidate's party and endorsements (Rahn 1993; Sniderman, Brody and Tetlock 1991), to characteristics such as a politician's gender, race, class, religion, and even physical appearance (Aguilar, Cunow and Desposato 2015; Burden, Ono and Yamada 2017; Calfano and Djupe 2009; Carnes and Lupu 2016; Todorov et al. 2005). However, despite significant media attention to the age bias of political institutions,[2] we know little about whether voters infer certain information based on the age of a candidate and, if so, how it affects their decision-making at the ballot box.

Could the shortage of younger politicians be due to voters preferring older, more experienced candidates over younger leaders? If voters generally dislike younger politicians, then young people may choose not to run for elected office as often as older people, or they may run but simply lose much more often at the polls.

Given the extensive research on voter biases concerning gender and race, it is easy to imagine that voters might similarly discriminate against candidates based on their age. Around the world, research shows that voters form stereotypes about female and racial or ethnic minority candidates (Kam and Kinder 2012; McConnaughy et al. 2010; Kage,

[2]See for example Derek Thompson, "Why Do Such Elderly People Run America?" *The Atlantic*, March 5, 2020, and Isabel Reynolds and Emi Urabe, "Japan Is Too Old-Fashioned, Says One of Youngest Ministers Ever," *Bloomberg*, September 11, 2019.

Rosenbluth and Tanaka 2019), and that these biases can help explain why so few women and minorities hold office (Dolan 2004; Aguilar et al. 2015; Ono and Yamada 2020), although they may play less of a role in contexts where other cues such as party affiliation are especially influential (Aguilar, Cunow and Desposato 2015; Lawless and Fox 2015; Hopkins 2009).

If anything, voters may feel relatively more comfortable acting on age stereotypes because in many contexts such biases are viewed as a more acceptable form of discrimination. For example, while there are strong social norms that a person's gender or race should not exclude them from office, age is closely connected to experience, energy, health, and mental acuity, all of which are seen as relevant grounds for judging a person's ability to serve as an elected representative. Moreover, while many countries have sought over time to remove restrictions and encourage greater participation by women and racial or ethnic minorities in elected office, codified discrimination against younger citizens has largely remained in the form of legal rules that set the minimum ages for a person to be eligible to vote or stand for office.[3] These restrictions are similarly seen as more understandable because of concerns about young people's cognitive development, experience, and maturity, even though the restrictions for certain positions can be as high as 40 years old for legislative offices and 50 for executive office in some countries.[4]

Age discrimination may be seen as more acceptable in part because age is often thought of as a "different" type of social identity, one that is universally experienced and changes at a constant rate with time. As Bidadanure (2015) writes, from a diachronic perspective young people will not be mistreated over the course of their whole lives: even if age biases against the young exist, everyone will be discriminated against equally when they are young, but young people will eventually become older and have their time to serve in office. Others have noted that age discrimination, while certainly an issue in many workplaces, does not come with the same level of historical animosity, domination, and exclusion as other identities

[3]Some countries have recently lowered the age of candidacy to match the minimum age requirement for voting, such as the United Kingdom, which lowered its age of candidacy from 21 to 18 in 2007.

[4]The minimum age of candidacy is 40 for the upper houses of Cameroon, Czech Republic, Rwanda, and Zimbabwe, and 50 to be president of Italy.

such as race and gender (Phillips 1995; Mansbridge 1999).

In this paper, we focus on two sources of age bias that may contribute to the shortage of younger politicians. The first is age stereotypes, by which we mean shared beliefs among the electorate about the relative ability of individuals of different ages to serve in public office. The second is in-group favoritism, wherein voters could prefer candidates closer to themselves in age. The former could lead to a shortage if there is widespread dislike of younger politicians among voters. The latter could lead to a shortage as a consequence of older voters turning out to vote at higher rates than younger voters.

In terms of age stereotypes, there are good reasons to believe that voters may view some candidates are "too young to run." Criticisms of younger generations in the political arena are common, in part because of their low voter turnout. As Holbein and Hillygus (2020, 7) write, young people have been described as "apathetic, disengaged, narcissistic, selfish, entitled, shallow, lazy, impulsive, confused, lost, impatient, and pampered." The conventional wisdom among studies of low youth turnout is that young people lack the interest, sense of civic obligation, or skills to participate in the electoral process, although they are often quite active in other political activities (Wattenberg 2007; Dalton 2008; Holbein and Hillygus 2020). It is possible that negative sentiments against younger voters could translate to a negative bias against younger candidates. Even though younger candidates may be seen as possessing some desirable qualities—from traits such as energy, technological expertise, and longer time horizons to greater familiarity with issues important to young people such as education, childcare, or climate change—we also know that voters value experience (e.g., Jacobson 1983; Shugart, Valdini and Suominen 2005). Younger candidates may therefore be seen as simply too inexperienced and lacking the necessary skills to be viewed as competent leaders when compared to older candidates.

There are also reasons to doubt whether voters truly prefer older politicians, however. Outside of work in political science, there is an extensive literature on ageism in other settings that finds age discrimination against the elderly is more common than biases against the

young (e.g., Kite et al. 2005). Studies on workplace discrimination have found that workers share a widespread belief that at a certain point job performance begins to decline with age (Kubeck et al. 1996; Gordon and Arvey 2004). While some view older workers as more dependable and trustworthy, others see them as being more resistant to change, lacking creativity, possessing fewer skills and less stamina, and being less willing to learn or work with others (e.g., Posthuma and Campion 2009).

The combination of biases against the young and old could also result in a belief that there is an "optimal" age for an elected official, a "Goldilocks" age that is neither too young, nor too old, and strikes a balance between the benefits of youth and experience. Again, in the workplace literature there are several examples where people perceive that there is a "correct age" for certain positions. Retail, sales, technology, and finance are often seen as particularly "young" industries (Broadridge 2001; McGoldrick and Arrowsmith 2001), whereas jobs that require more managerial skills are typically associated with older workers (Cleveland and Hollmann 1990). Negative stereotypes about workers are often strongest when applicants do not match the perceived correct age for the position (Perry, Kulik and Bourhis 1996). Thus, it could be that voters believe there is a best age for someone to serve as their representative, and judge too young or too old candidates more harshly.

Alternatively, a second framework that could explain the under-representation of younger people in office is in-group favoritism. People may feel the strongest connection to candidates closer to themselves in age because people tend to identify more strongly with members of their in-group, such as those who share a social identity (Tajfel and Turner 1986). As in the literature on descriptive representation, there could be a belief that candidates who are closer in age to a given voter will better emphasize policy issues that are important to members of their age group (Webster and Pierce 2019). Since middle-aged and older people turn out to vote at much higher rates than younger people, however, the distribution of politicians could thus reflect the distribution of actual voters, rather than the distribution of the electorate.

As it stands, relatively few studies focus on voter attitudes toward the age of elected

officials, with two recent exceptions. The first is Pomante and Schraufnagel (2015), who run an experiment with American college students where they randomly present respondents with photos of candidates of different ages. The authors focus on turnout, rather than vote choice, and find that younger people are more likely to say they will participate in elections when there are younger candidates on the ballot. In the second, Webster and Pierce (2019) use survey data from the Cooperative Congressional Election Study (CCES) to gauge whether voters are more likely to support candidates closer to themselves in age. The authors find some support for the use of age-based heuristics, although their use is most prevalent in low-information elections, among higher educated individuals, and in judgments made about co-partisan candidates.

These studies are not without their limitations, however. Both studies focus exclusively on the United States, consider only in-group favoritism rather than general age stereotypes, and confront some methodological challenges. Pomante and Schraufnagel (2015) rely on student subjects, which means that we do not know how voters from other age groups would react to their experiment. The authors also use photos of different candidates, who differ in many ways apart from age, complicating their findings. Webster and Pierce (2019), by comparison, rely on observational data, which has the added benefit of realism, but raises concerns about selection bias. It might be that candidates from certain age groups share other characteristics apart from age that make them more likely to receive support from similarly aged individuals.

Although not focused on age, there is also some evidence concerning age biases from studies using conjoint experiments that explore other research questions. Contrary to the aforementioned studies, these experiments only test for overall bias, not in-group favoritism, likely because age is generally included only as a control variable. The findings from these studies are mixed, and sometimes conflicting. Depending on the setting and other variables included, these studies alternately find that voters prefer younger candidates, middle-aged candidates, or have no preference (Arnesen, Duell and Johannesson 2019; Clayton et al.

2019; Horiuchi, Smith and Yamamoto 2020; Kirkland and Coppock 2017; Kage, Rosenbluth and Tanaka 2019; Ono and Burden 2019; Teele, Kalla and Rosenbluth 2018). In Japan, the two conjoint experimental studies that include age have found that voters prefer younger candidates for the House of Representatives, but paradoxically they also prefer candidates with more experience such as incumbents that have held onto their seats for more than a decade (Kage, Rosenbluth and Tanaka 2019; Horiuchi, Smith and Yamamoto 2020).

Conjoint experiments, too, have their strengths and weaknesses. Within candidate choice experiments, conjoint analyses have a clear advantage compared to traditional vignette experiments in their ability to control for a wide range of candidate characteristics and approximate an information-rich environment (Hainmueller, Hopkins and Yamamoto 2014). One disadvantage, however, is that the process of evaluating long lists of candidate attributes against one another differs from the typical cognitive process that many voters go through when evaluating candidates in real-world elections. Many voters do not collect such detailed information on the set of candidates prior to voting, but instead rely on informational shortcuts based on easy-to-observe characteristics of candidates such as their party, gender, race, and, per our contention, age. Conjoint experiments can also present voters with unrealistic profiles, such as younger candidates that have accumulated more terms in office than is likely or even possible. Additionally, certain combinations may have interaction effects on voter evaluations of candidate quality: younger candidates with lots of prior election wins may be seen as superior when compared to older candidates that have failed to win even once.

We set out to test whether voters dislike younger or older politicians using an original experimental design in Japan. We see our experiment as a complement to conjoint analyses by focusing on a comparably low-information environment that mimics the real-life process that voters go through when they evaluate a candidate's age via their appearance. Our focus on age biases also enables us to test for both general stereotypes and in-group favoritism within the same analysis, as well as the mechanisms underlying age discrimination in elections.

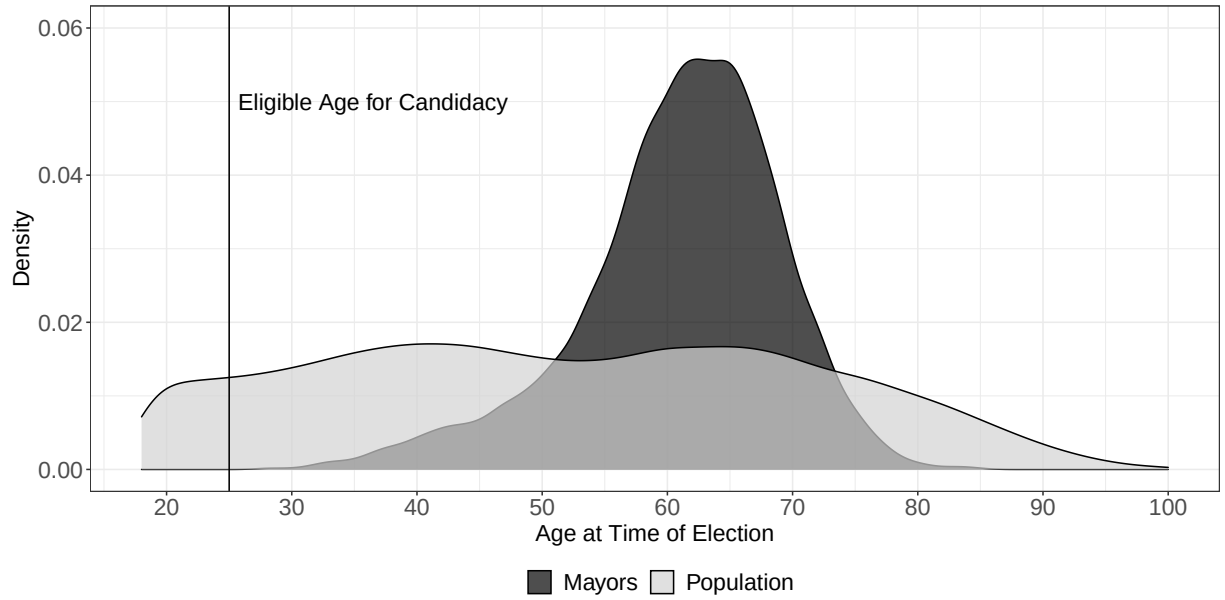
Evidence from Two Candidate Age Experiments in Japan

Japan provides an ideal setting in which to test for age biases against political candidates for several reasons. First, young people have traditionally been under-represented in political institutions across Japan, yet age-related policy issues are salient given that the country faces the demographic challenges of a declining birthrate and rapidly aging population. Japan is also a society where there are strong age norms regarding elder respect and the roles of younger and older people in society.

Second, we focus in particular on mayoral elections, which involve candidate-centered campaigns where nearly every candidate runs as an independent. Rather than relying on a party label, candidates in these campaigns devote significant effort to developing a personal vote. Campaigns in Japan are also famous for their strict regulations and heavy reliance on campaign posters, which are posted throughout the municipality in high traffic areas and feature above all else the candidate's name and photo (McElwain 2008). Voters in Japan are thus used to learning about candidates via these posters, which for many is their first indication that an election is approaching (Lewis and Masshardt 2002). Furthermore, the candidate pool for mayoral races is largely homogeneous—over 99% are ethnically Japanese and over 98% are men—making age one of the most distinct differences between candidates.

Figure 1 shows the age distribution of mayors elected between 2004 and 2019 compared to that of the voting age population. Japanese citizens must be at least 25 years old to run for mayor, but the median age of an elected mayor is considerably higher at 62, 10 years older than the median eligible voter (52). Figure 1 also reveals that younger voters are by far the most under-represented age group: people under 50 make up nearly half (47%) of the electorate, but just 9% of mayors. By contrast, middle-aged voters are clearly over-represented: individuals between the ages of 50 and 70 comprise a third (32%) of eligible voters, yet make up 79% of mayors. Lastly, elderly voters are also under-represented in office, although to a lesser extent than younger voters. Citizens who are 70 or older represent a

Figure 1: Age Distribution of Mayors in Japan, 2004–2019



Sources: Japanese Municipal Elections Dataset (McClean 2020); Statistics Bureau of Japan (2004–2019).

fifth (21%) of the voting age population as opposed to 12% of mayors. The modal mayor in Japan begins their term at 65 years old, the national age of retirement.

Finally, mayors in Japan have significant discretion over municipal policy. In evaluating candidates, the advantage here is that survey respondents can expect that younger and older candidates will have similar responsibilities in office regarding policy decisions. By contrast, representatives in a legislature often have to work with other representatives, their party leadership, and the executive in order to pass legislation. Moreover, given that legislatures in Japan operate under strong seniority norms, respondents might expect that older legislators (with potentially more experience in office) will have much more influence over policy than younger legislators. Mayoral elections thus provide a setting where voters can believe that a politician's age has the clear potential to influence policy outcomes.

Experiment 1: Candidate Age and Voter Biases

To test for age biases, we fielded two experiments embedded in two different nationally representative surveys in Japan. Experiment 1 was administered in March 2020 by Rakuten Insight Inc., one of the major survey companies in Japan. We randomly selected our survey sample from Rakuten's subject pool after adjusting their settings to match the population census in terms of respondent age, sex, and region of residence. We initially aimed at collecting a sample size of 3,000 but received more than 3,000 valid responses.

For Experiment 1, we began by purchasing licenses from Shutterstock to use and manipulate the photos of two different male Japanese models (Table 1). We selected these models because they looked similar to typical mayoral candidates and their photos looked similar to typical campaign materials such as candidate posters. In the photos, both models are wearing dark grey suits with brightly colored ties, have slight smiles, face directly toward the camera, and have relatively conservative haircuts that could be seen on people of different ages. One of the models is additionally raising a clenched fist in a sign that is commonly used by candidates of all ages in Japanese elections.

After purchasing these photos, we next manipulated them to appear younger or older using FaceApp. FaceApp is a free, mobile application created by Wireless Lab for both iOS and Android that became popular in summer 2019 because of its ability to realistically age or de-age a user's photos. While such applications had existed before, FaceApp became especially popular thanks to its photorealism and its use by many celebrities. On social media, the app went viral on Twitter and Instagam under the #AgeChallenge, which challenged people to upload images of themselves with the app's old-age filter applied. By mid-July, more than than 150 million people had downloaded the app.[5]

While FaceApp uses a proprietary algorithm that Wireless Lab does not share publicly,

[5]The application also came under controversy for privacy concerns about how the Russian company was using an individual's photos. See for example John Koetsier, "Viral App FaceApp Now Owns Access to More Than 150 Million People's Faces and Names," *Forbes*, July 17, 2019.

Table 1: Hypothetical Candidates for Mayor

	Younger	Middle-Aged	Older
Model 1			
Model 2			

Notes: In Experiment 1, respondents were randomly shown two candidate photos at the same time, one of each model. In Experiment 2, respondents were randomly shown one candidate photo.

the company has said that it ages or de-ages photos using artificial intelligence and neural networks. More specifically, this process involves manipulating faces along several dimensions, including changes to (i) wrinkles, especially on the forehead, above the nose, and in the smile lines between the nose and mouth; (ii) skin elasticity, as skin becomes looser as we age, especially underneath the eyelids and around the neck; (iii) color contrast, as faces with high color contrast between the eyes, lip, and mouth tend to appear younger than faces with low contrast; (iv) skin pigmentation, as hormones and sun exposure darken the skin over time; and finally (v) hair color, as our hair follicles tend to grow grey, silver, or white as we age.

Importantly, FaceApp only manipulates elements of each photo that are likely to change with aging, but does not modify the model's underlying facial structure, expression, hair, or anything related to their clothes or the background of the original photo. Moreover, the manipulated photographs retain sufficiently high resolution such that each photo looks realistic. Using such photos in our experiment thus effectively controls for any potential

confounding factors unrelated to aging that might arise from using different models or actual candidate photos. This is especially important given the extensive literature on how aspects of a candidate's appearance such as attractiveness, smile, facial structure, and skin tone can influence voter evaluations (Atkinson, Enos and Hill 2009; Bailenson et al. 2008; Ballew II and Todorov 2007; Banducci et al. 2008; Berggren, Jordahl and Poutvaara 2010; Caruso, Mead and Balcetis 2009; Horiuchi, Komatsu and Nakaya 2012; King and Leigh 2009; Kirkland and Coppock 2017; Krupnikov, Piston and Bauer 2015; Lawson et al. 2010; Terkildsen 1993; Todorov et al. 2005; Weaver 2011)

We used FaceApp to create three versions of each model's photo that approximated the age range of mayoral candidates in Japan, which are shown in Table 1. For each model, we aimed to create one photo on the younger end of the spectrum, one middle-aged, and one older. In a pilot survey (sample size: 300), we asked respondents to guess each model's age to verify that the photos met our expectations. Respondents estimated that the three versions of Model 1 were 37, 62, and 82 years old, and that the three versions of Model 2 were 33, 58, and 80 years old. We also checked respondent estimates of each candidate's age in the survey itself (sample size: 3,000), and ended up with slightly younger estimates: respondents thought that the photos of Model 1 were 29, 52, and 72 years old, respectively, and that the three photos of Model 2 were 30, 51, and 72 years old.

For Experiment 1, we randomly assigned respondents to view two photos (one of each model) from Table 1 and told respondents that that they would be asked a series of questions about a mayoral election in which these two people were the candidates. We additionally mentioned that (i) neither candidate was the incumbent; (ii) both candidates were independents; and (iii) the election was for a city where the respondent resides. Our experiment is thus a 3×3 factorial design, where the three levels of each treatment are the younger, middle-aged, and older versions of each model's photo.

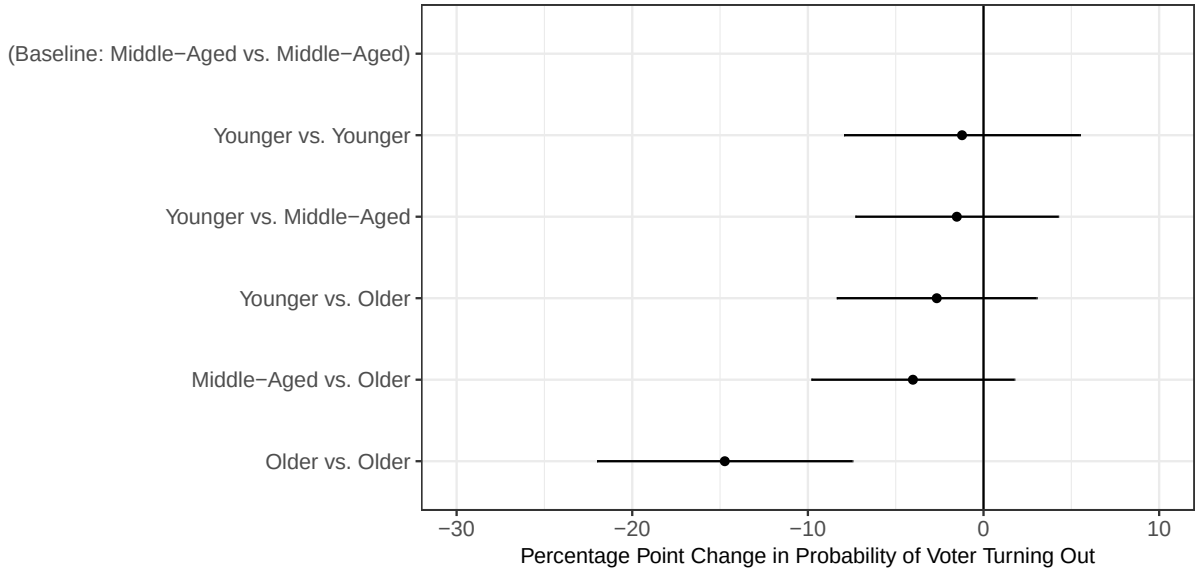
After showing the two candidate photos, we then asked each respondent two questions: whether the respondent would turn out to vote in an election featuring these two candidates

on the ballot, and which candidate the respondent would vote for in the election. Our two main goals were to test whether voters are more likely to turn out or support candidates of a certain age group compared to others (age stereotypes) and whether they view candidates closer to themselves in age more favorably (in-group favoritism).

Our research design does have some disadvantages relative to existing candidate choice experiments, such as those rely on vignette or conjoint analyses. The first is that we cannot control for other relevant characteristics of candidates that might affect voter evaluations or interact with age, such as a candidate's work history or stated issue positions. The second is that we lack some specificity with regard to the candidate's age. Whereas vignette and conjoint analyses can list the exact age of candidates, we ask respondents to make their own judgements based on photos.

Yet, we believe that our design offers several advantages and serves as an important complement to other experimental work. The first is the added realism of relying on candidate faces rather than researcher-created stories about the candidate or long lists of candidate attributes in paired tables. We seek to approximate how voters might react when they see a candidate in person or in their campaign materials. Our experiment thus emulates a sensation that is closer to a first impression or a low-information environment where voters do not necessarily know a lot about each candidate's background or issue positions. Our study is closest to that of Pomante and Schraufnagel (2015), but we improve on their research design by using manipulated photos of the same person rather than different models and photos that differ along multiple dimensions apart from age. The innovation to our design is that we use advances in machine learning to create realistic photos that would not otherwise be possible, allowing us to capture voter evaluations about candidates at different stages in their life cycle within an experimental setting.

Figure 2: Candidate Ages and Turnout



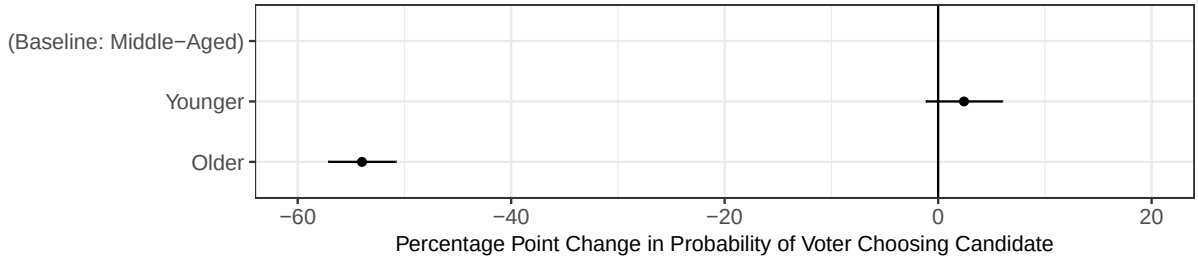
Notes: Dependent variable is equal to 1 if a respondent said they would turn out for an election with these candidates on the ballot, and 0 otherwise. Baseline turnout is 79%. Bars show 95% confidence intervals.

Do Voters Dislike Younger or Older Politicians?

Do voters hold certain biases toward candidates based on their age? To find out, we begin by considering how our candidate photos affected respondent willingness to turn out in a hypothetical election. For ease of presentation, we average our results across the two models such that Younger Model 1 vs. Middle-Aged Model 2 is treated the same as Middle-Aged Model 1 vs. Younger Model 2. We thus collapse our 3×3 experiment into six treatment conditions: Younger vs. Younger, Younger vs. Middle-Aged, Younger vs. Older, Middle-Aged vs. Middle-Aged, Middle-Aged vs. Older, and Older vs. Older.

Figure 2 plots the likelihood of respondents saying that they would turn out to vote across these treatment groups, using turnout in Middle-Aged vs. Middle-Aged elections (79%) as the baseline condition. The first four treatments are strikingly similar and do not differ significantly from the baseline group. So long as at least one candidate was younger or middle-aged, voters responded that they would be just as likely to participate in the election. By comparison, respondents were 15 percentage points less likely to report that they would

Figure 3: Candidate Age and Vote Choice



Notes: Dependent variable is equal to 1 if the respondent said they would vote for the candidate, and 0 otherwise. Bars show 95% confidence intervals.

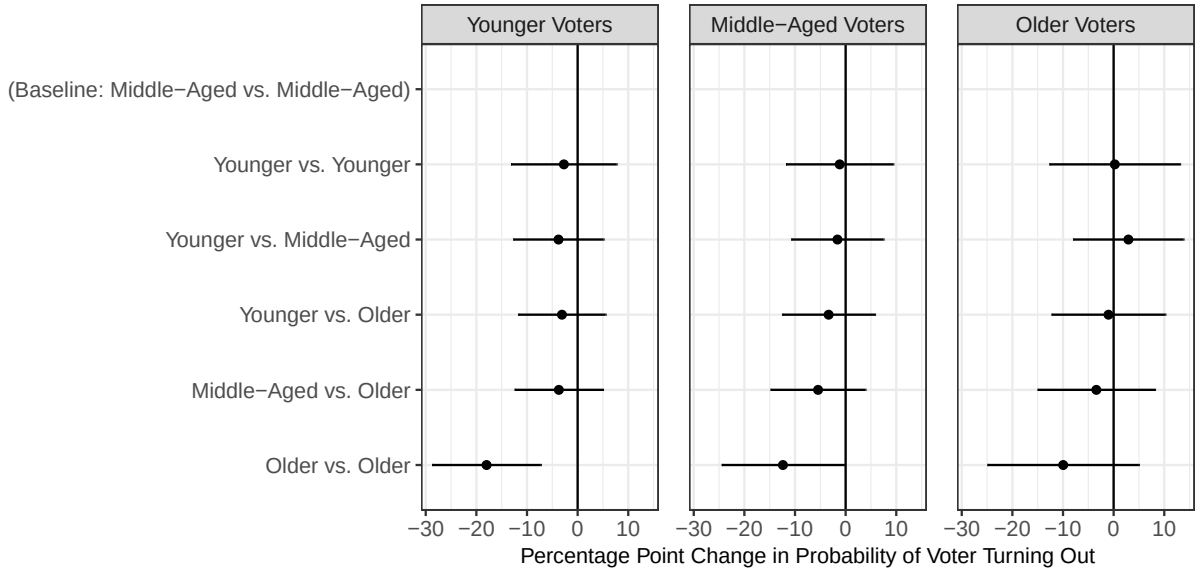
turn out when both candidates were older. In sharp contrast to the idea that voters prefer older politicians over younger ones, we find that voters are significantly less interested in mayoral contests with only older candidates.

Does this bias against elderly politicians affect vote choice as well? Figure 3 plots the difference in the probability that respondents would vote for the younger or older candidate, using the middle-aged candidate as the comparison condition. We again average our results across both models, but this time focus only on choices made by respondents in treatment conditions where the candidates in the hypothetical election differed in age: Younger vs. Middle-Aged, Younger vs. Older, and Middle-Aged vs. Older.

As shown in Figure 3, we find that voters disliked older candidates substantially more than either younger or middle-aged candidates. When presented with a mayoral race between an older candidate and either a younger or middle-aged candidate, voters were more than 50 percentage points less likely to choose the older candidate. In contrast, voters appeared equally willing to cast their vote for either the younger or middle-aged candidate.

Taken together, these findings thus suggest that voters have a strong, negative bias against elderly politicians, but do not dislike younger politicians compared to other age groups. While demand-side factors may play a role in explaining the steep drop-off in the number of candidates that run for office after age 70, our results suggest that voter biases are not to blame for the shortage of younger candidates. Voters do not dislike younger candidates

Figure 4: Candidate Ages and Turnout by Age of Respondent



Notes: Dependent variable is equal to 1 if a respondent said they would turn out for an election with these candidates on the ballot, and 0 otherwise. Baseline turnout is 73% for younger voters (under 50), 83% for middle-aged voters (50–69), and 89% for older voters (70 and over). Bars show 95% confidence intervals.

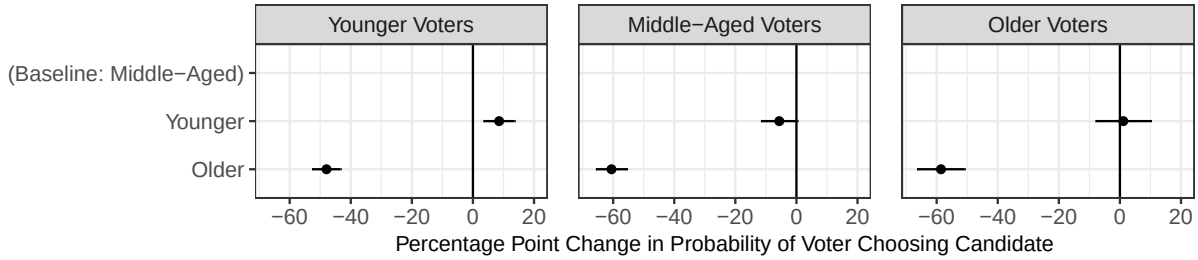
any more than middle-aged candidates, even though mayors under 50 are outnumbered nearly 9 to 1 by mayors between the ages of 50 and 70 (Figure 1).

In-Group Favoritism

A second pathway through which age biases could help explain the shortage of younger candidates is in-group favoritism. If voters view candidates closer to themselves in age more favorably, but older voters turn out at much higher rates than younger voters, then the end result could still be an electorate-level bias toward older candidates. To explore this possibility, we break down our experimental results in Figure 4 into three groups depending on the age of the respondent: younger voters (under 50), middle-aged voters (50–69) and older voters (70 and over).

We again find that the first four treatment conditions, where at least one candidate is younger or middle-aged, are not significantly different from the baseline group (Middle-Aged vs. Middle-Aged) for any respondent age group. Where we do see some difference across

Figure 5: Candidate Age and Vote Choice by Age of Respondent



Notes: Dependent variable is equal to 1 if the respondent said they would vote for the candidate, and 0 otherwise. Bars represent 95% confidence intervals.

age groups, however, is with the Older vs. Older treatment: younger voters experience the largest, most significant drop in turnout compared to middle-aged or older voters. Younger voters, who already have the lowest baseline turnout—both in our survey and in actual elections—are also the ones most turned off to voting by an election that features only elderly candidates.

In Figure 5, we similarly break down our results for vote choice by age of respondent. We find some evidence of in-group favoritism for younger and middle-aged voters, but not for elderly voters. When comparing younger and middle-aged candidates, we find that younger voters are 8.6 percentage points more likely to choose the younger candidate ($p<0.01$), whereas middle-aged voters are 5.6 percentage points more likely to vote for the middle-aged candidate ($p=0.06$). By comparison, the right panel in Figure 5 reveals that older voters do not feel significantly more attached to older candidates than other age groups, and in fact tend to dislike them even more than younger voters.

Given that middle-aged voters turn out at higher rates than younger voters, could this level of in-group favoritism help explain the shortage of younger candidates? In the Appendix, we re-estimate the vote choice analyses shown in Figure 3 for likely voters, i.e., those who self-reported that they would turn out for the race (Figure A1). While likely voters chose middle-aged candidates more often than younger candidates, the estimate is small (1 percentage point) and not statistically significant. In comparison, the negative bias against

elderly candidates is even larger at more than 60 percentage points.

In sum, our findings again suggest that voter biases are unlikely to play a substantial role in explaining the under-representation of younger politicians in mayoral offices, but they may help explain the relative absence of much older politicians.

Evidence from Actual Mayoral Elections

Experiments tend to have high internal validity, but they can suffer from low external validity. While we believe that our experiment approximates the real experience of Japanese voters, there are of course clear differences between viewing a candidate photo via an online survey and seeing a candidate in person or on a poster on the street, not least because the latter person is an actual candidate for office.

In this paper, we test whether our findings generalize to actual elections using the Japanese Municipal Elections Dataset (JMED) assembled by McClean (2020). This newly created dataset includes information on the near universe of candidates who competed in mayoral elections between 2004 and 2019, including information on their age, gender, incumbency, and vote share as well as turnout in the election. Using this data, we focus on competitive races and set up both election- and candidate-level analyses where the dependent variables are turnout and vote share, respectively. To avoid the methodological complication that candidate vote shares in the same election are not independent of one another, we focus on the top-two candidates in races between incumbents and challengers and then estimate each regression analysis separately. Our key independent variables are the sum of the two candidate's ages for our turnout analysis and each candidate's age for the vote share regressions. Finally, for each analysis, we first estimate the bivariate relationship and then a model that includes controls for gender, incumbency, and municipality and year fixed effects.

The results in Table 2 provide further evidence in support of our survey experiments. In terms of turnout, we find in our fully specified Model 2 that turnout declines as the sum of candidate ages increases. Our within-municipality estimate suggests that for every

Table 2: Candidate Age, Turnout, and Vote Choice in Actual Mayoral Elections

	DV: Turnout		DV: Vote Share			
	Elections		Incumbents		Challengers	
	(1)	(2)	(3)	(4)	(5)	(6)
Sum of Candidate Ages	0.183***	−0.051***				
	(0.027)	(0.017)				
Age of Candidate			−0.319***	−0.555***	−0.131***	−0.211***
			(0.035)	(0.053)	(0.027)	(0.037)
Female		−2.409***		−2.864		−6.611***
		(0.585)		(3.450)		(1.354)
Incumbent		−1.586***				
		(0.322)				
Constant	41.685***		79.733***		48.572***	
	(3.279)		(2.222)		(1.588)	
Observations	3,388	3,388	2,879	2,879	2,710	2,710
R^2	0.018	0.930	0.036	0.636	0.009	0.644
Municipality Fixed Effects	No	Yes	No	Yes	No	Yes
Year Fixed Effects	No	Yes	No	Yes	No	Yes

Notes: Analysis is for the top-two candidates in competitive races for mayor (2004–2019). Standard errors clustered by municipality are shown in parentheses. *p<.1; **p<.05; ***p<.01.

additional 10 years of age among the top-two candidates, turnout declines by approximately 0.5 percentage points. Interestingly, the sign of this effect is reversed in our model without controls or fixed effects. This implies that there is a relationship between the types of municipalities or election years that tend to have higher turnout and the average age of candidates that contest mayoral elections. At the municipality level, this finding makes sense given that turnout is often very high in smaller towns and villages in Japan (Horiuchi 2005), where candidates for mayor also tend to be older (McClean 2020).

Turning to vote share, we find that older candidates for mayor tend to receive a significantly lower percentage of the top-two candidate vote share. For every 10 years of a candidate's age, our results suggest that incumbents receive as much as 5.6 percentage points less in vote share (Model 4), whereas the vote share of challengers declines by 2.1 percentage points (Model 6). These are substantively large effects, and hold even when controlling for other characteristics of candidates and time-invariant factors specific to certain

municipalities and election years.

Although not the main focus of this study, we also find in Table 2 that turnout is significantly depressed by 2.4 percentage points when there are female candidates in the race (Model 2). Moreover, while female incumbents tend to receive the same number of votes as their male counterparts (Model 4), female challengers receive 6.6 percentage points less on average (Model 6). These results deserve further attention in a separate study, but in this paper they provide an interesting context with which to compare age and gender biases. We find that on average, the voter bias in turnout against candidates that are 10 years older is about one fifth that of the bias against female candidates (0.5 vs. 2.4 percentage points). As for vote choice, age biases appear to be more influential than gender biases when it comes to incumbents, as the latter is not statistically significant, whereas the bias against challengers that are 10 years older is roughly a third that of the bias against female challengers (2.1 vs. 6.6 percentage points).[6]

Experiment 2: Mechanisms of Age Discrimination

Why do voters dislike elderly candidates? Why do younger and middle-aged voters like candidates closer to themselves in age, but older voters do not? As discussed earlier, we focus on two potential mechanisms of age discrimination: (i) statistical discrimination, where voters use age as a heuristic with which to infer information about the expected performance of an older politician in office, whether accurate or not, and then evaluate the politician based on this information; and (ii) taste-based discrimination, where voters just plainly dislike older candidates without any clear explanation.

To test for the influence of these two mechanisms, we fielded a second experiment with a nationally representative survey in Japan. Experiment 2 was administered in March 2020 as part of the "Survey on Attitudes Toward Politics, Society, and the Economy," which was conducted by the Research Institute of Economy, Trade, and Industry, a policy think tank

[6]Here, the observed gender bias in actual elections runs counter to the null findings found in conjoint experiments in Japan (Kage, Rosenbluth and Tanaka 2019; Horiuchi, Smith and Yamamoto 2020)

in Japan. Our sample size was again 3,000 respondents.

In Experiment 2, we consider three pathways through which this age discrimination against elderly candidates may operate. The first is that voters may infer that older politicians will focus on issues less important to many younger or middle-aged voters, or perhaps that they have less energy to focus on issues in general. The second is that voters may infer that older people have less favorable traits and will be less competent as politicians. The third, which does not necessarily relate to statistical discrimination, is that older candidates may be disliked because they are viewed as less physically attractive (e.g., Todorov et al. 2005). We then compare to what extent these factors predict a voter's belief about a candidate's electability (statistical discrimination) and test whether there is any residual dislike of older politicians after controlling for these factors (taste-based discrimination).

More specifically, in the experiment we randomly assign respondents to view a single candidate photo and then ask them questions about the candidate's likely issue emphases, traits, attractiveness, and electability. We mentioned that the candidate was running for a mayoral election for a city with a population around 300,000. We chose to specify the population of the city as municipalities in Japan range significantly in size, from a population less than 100 to more than 3 million. Mayors of cities with populations above 200,000 are granted additional discretionary powers by the central government over municipal policy. We decided to ask about a relatively larger city to avoid having respondents make their own inferences about the type of municipality and level of mayoral discretion. Each respondent completes the experiment twice, once for each model, with each experiment thus being a 1×3 design.

Policy Issues

When voters see candidates of different ages, do they infer that these candidates will emphasize different policy issues? One possibility is that voters associate politicians more with issues that are especially salient for members of the politician's age group. Thus, voters may

believe that younger politicians will focus more on education and childcare; middle-aged politicians may be seen as especially concerned with the economy; and older politicians may be linked most to elderly care and healthcare. If these issues are important to voters, then voters may prefer candidates in their age group because they believe these candidates will devote the most attention to these age-related issues. A second possibility is that voters associate age with overall energy level and attention to policy in general. Voters may therefore dislike elderly candidates more than middle-aged or younger ones because they believe that older candidates will devote the least energy to policy issues.

To assess these hypotheses, we asked respondents how likely they thought each candidate would be to emphasize 11 different policy issues. We selected these issues based on our own substantive knowledge about local government in Japan and by consulting past elite and public opinion surveys. For each issue, respondents answered on a 5-point Likert scale, ranging from "Very Unlikely" to "Very Likely" to emphasize the issue. In the main text, we focus on the percent of respondents who said that the candidate would be "Likely" or "Very Likely" to emphasize the issue.

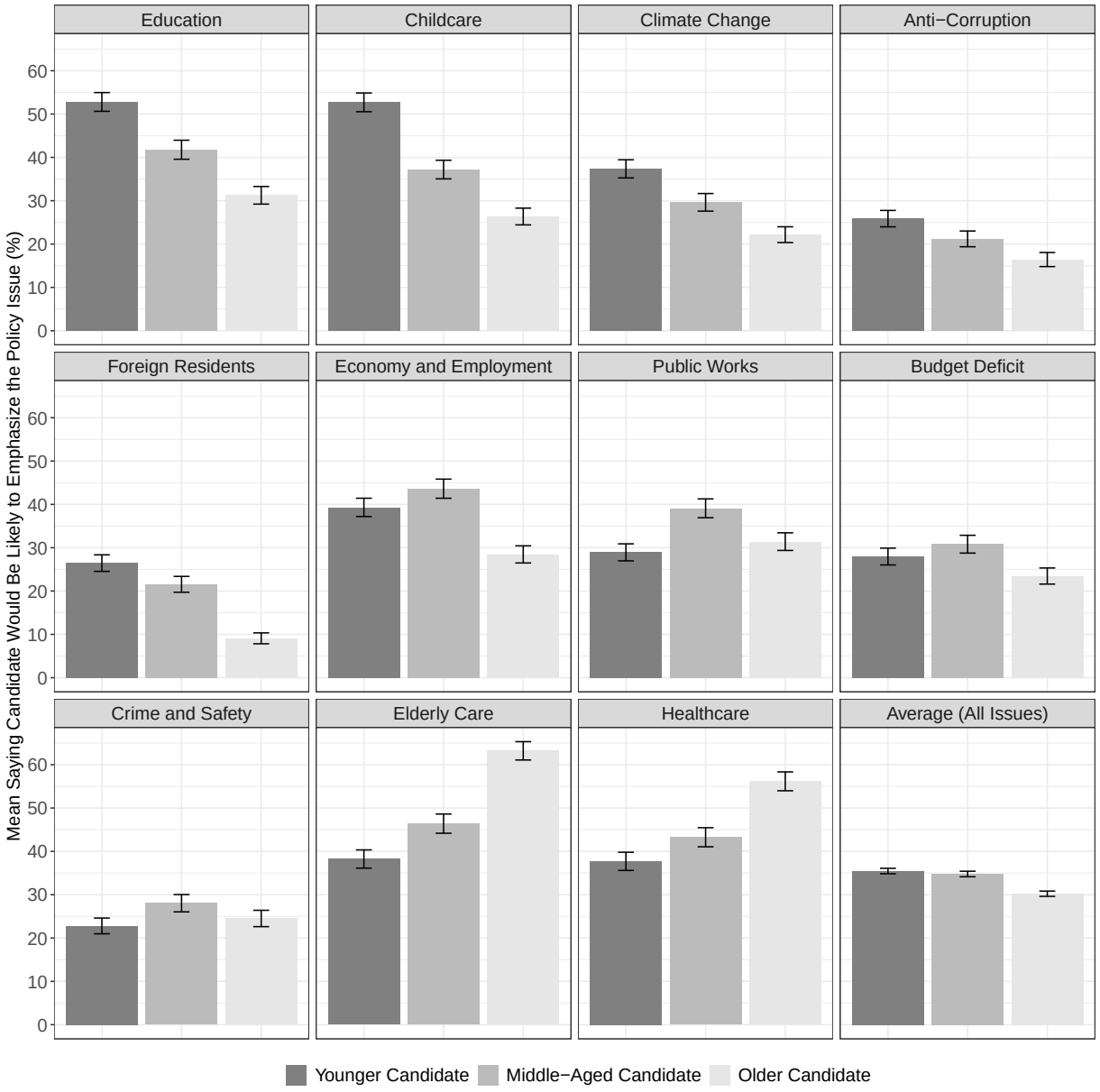
Figure 6 plots the average responses for our 11 policy issues together with a 12th plot that calculates the average level of issue attention by candidate age group. As with our earlier experiments, we average the results across our two models.[7]

We find clear age differences across these policy issues. Respondents in general thought that younger candidates would be more likely to focus on education, childcare, environment and climate change, anti-corruption, and foreign residents and multiculturalism. Middle-aged candidates were most associated with the economy and unemployment, public works, budget deficit, and crime and safety, Finally, older candidates were seen as emphasizing elderly care and healthcare.

We can also see that the most popular issues that voters connected with candidates relate to welfare and the economy. It is notable that the top two issues receiving focus

[7]We find no substantial differences if we instead calculate the results separately for each model.

Figure 6: Candidate Age and Policy Issues



Notes: Dependent variable is equal to 1 if respondents said that the candidate would be "Likely" or "Very Likely" to emphasize the policy issue, and 0 otherwise. Bars represent 95% confidence intervals.

across candidates were those that are most important to elderly voters: elderly care (49.3%) and healthcare (45.7%). Education (41.9%) and childcare (38.8%) did follow close behind, but our results still indicate that on average voters expect politicians to pay more attention to elderly issues. We also see the biggest differences in voter inferences on these age-related welfare issues: voters saw younger candidates as more than 20 percentage points more likely

to focus on education and childcare compared to older candidates, and likewise more than 20 percentage points less likely to emphasize either elderly care or healthcare relative to older candidates.

Issues related to the economy came in second to welfare concerns, such as the economy and employment (37.1%), public works (33.1%) and budget deficit (27.4%). For these issues, however, we find a curvilinear relationship where voters associated the middle-aged candidate most with economic issues. This finding could reflect voter perceptions that middle-aged candidates strike a balance between having more experience with the economy compared to younger candidates, yet still being active participants in the labor force compared to older candidates.

Among the issues receiving somewhat less attention, we can also see that voters clearly connected younger candidates with more liberal issues such as climate change (29.7%), anti-corruption (21.2%), and foreign residents and multiculturalism (19.0%). The age gap for climate change is especially large, with voters perceiving younger candidates as being more than 15 percentage points more likely to emphasize the issue relative to older candidates.

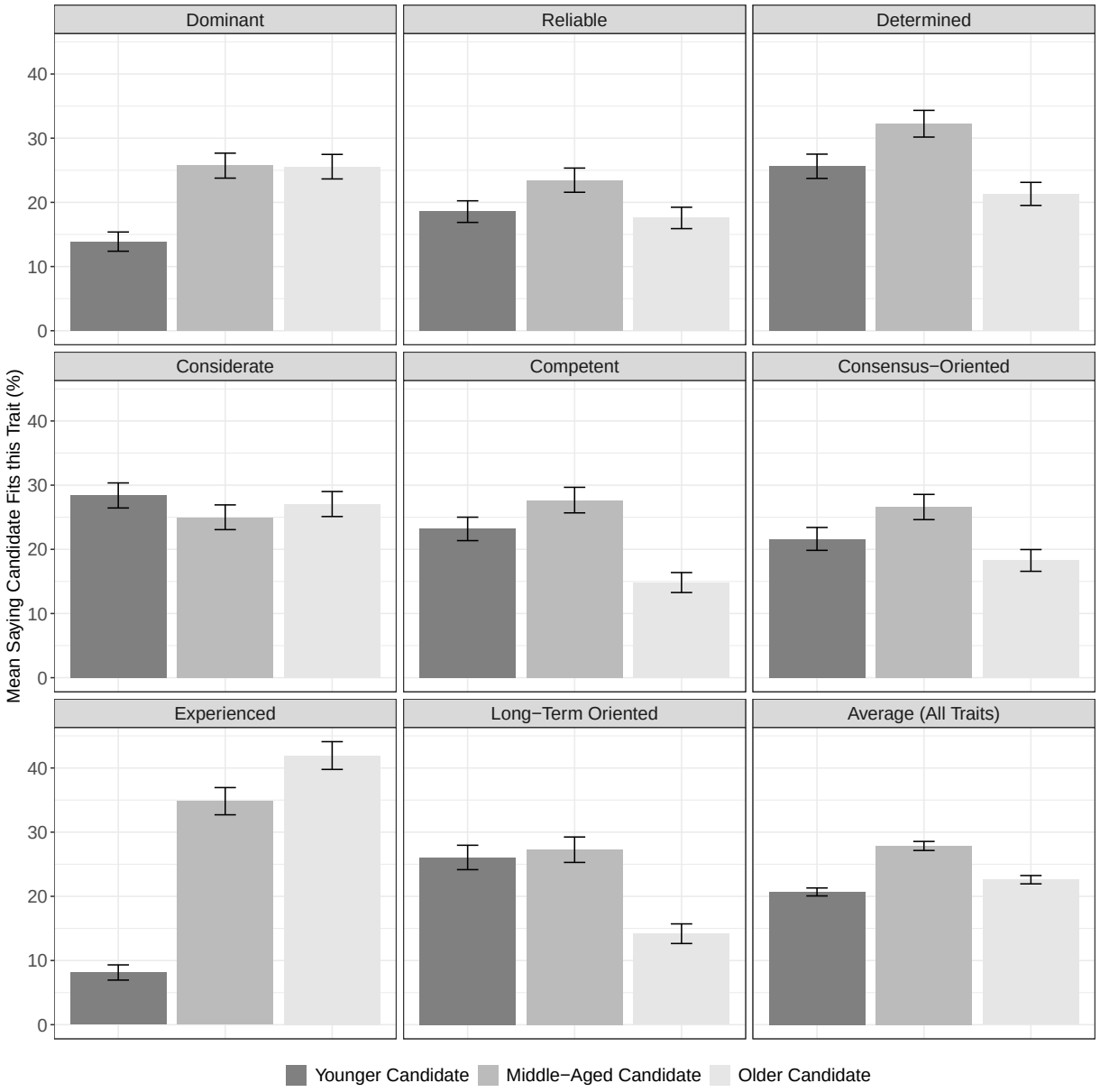
Finally, we find in our last plot that older candidates are seen as devoting the least attention to issues overall by about 5 percentage points relative to the other age groups. While we conduct more formal tests later in the paper, this perceived lack of attention to policy issues—especially those apart from elderly care and healthcare—could be part of the story for why older candidates are viewed so negatively by voters.

Traits

Do voters believe that older politicians lack the traits necessary to be effective in office? Figure 7 explores the link between a candidate's age and respondent evaluations about their likely traits. We asked about eight different traits in all, and again include a final plot that shows the overall average across traits.

We find that middle-aged candidates are generally viewed the most favorably, with some

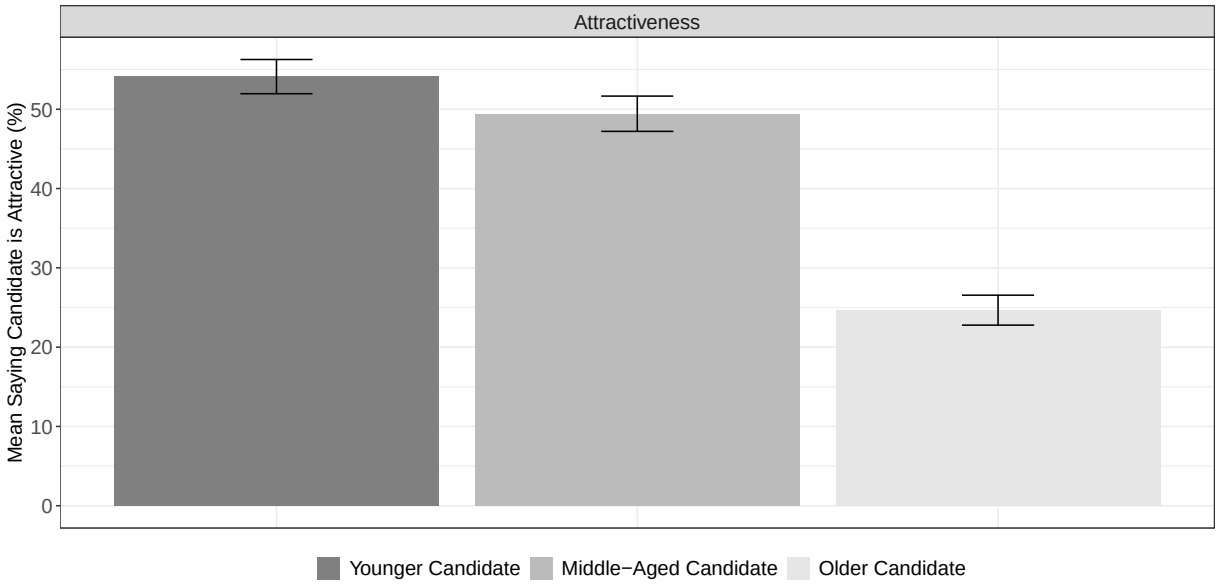
Figure 7: Candidate Age and Traits



Notes: Dependent variable is equal to 1 if respondents said that the trait was "Applicable" or "Very Applicable" to the candidate, and 0 otherwise. Bars represent 95% confidence intervals.

exceptions. Voters inferred that middle-age candidates would be more likely to be reliable, determined, competent, and consensus-oriented than other age groups. Younger candidates were seen as the most considerate, albeit by a small, insignificant margin, and the least dominant. Older candidates were seen as the most experienced and the least long-term oriented.

Figure 8: Candidate Age and Attractiveness



Notes: Dependent variable is equal to 1 if respondents said that the candidate's appearance was "Very Good" or "Good," and 0 otherwise. Bars show 95% confidence intervals.

Perhaps unsurprisingly, we find the largest difference in experience. Respondents were over 35 percentage points less likely to report that the younger candidate should be seen as experienced compared to the older candidate, and over 25 percentage points less likely compared to a middle-aged candidate.

Thus, while the average result shown in the last box suggests that younger candidates are evaluated least favorably with regard to traits, this effect is largely driven by experience. Compared to older candidates, for example, younger candidates are seen as significantly more determined, competent, consensus-oriented, and long-term oriented, whereas older candidates are seen as more dominant.

Attractiveness

Are older candidates viewed as less attractive than other candidates? Figure 8 plots the results from our question asking survey respondents whether they found their randomly assigned candidate photo to be attractive. As suspected, younger candidates are seen as the most attractive, followed closely by middle-aged candidates, with older candidates lagging

behind by more than 25 percentage points.

Electability

The previous three sections have found that voters draw clear links between a candidate's age and their issue emphases, traits, and attractiveness. Across all three categories, older candidates tended to fare less favorably, with the exception of questions about elderly issues and experience. Do these three factors explain why voters tend to dislike older candidates? Or do voters still dislike older candidates even when controlling for these characteristics?

We put these questions to the test by examining the individual-level correlation between respondent answers to these three questions, the respondent's own age, their estimate of the candidate's age, and a final question where they rated the overall electability of the candidate. As with previous survey questions, the electability question was asked using a 5-point Likert scale, but here we dichotomize the responses such that the dependent variable equals to 1 if the respondent said the candidate was "Likely" or "Very Likely" to be elected mayor, and 0 otherwise. Table 3 reports the results from separate OLS regression analyses for each candidate age, averaged across the two models.

Across these three models, we can see that voter inferences about a candidate's policy issues, traits, and attractiveness are significant predictors of their opinions about the candidate's likely success, with the exception of policy issues for older candidates. We find that each additional policy issue (up to 11) raises voter expectations about a candidate's electability by 1.7 to 2.1 percentage points for younger and middle-aged candidates, respectively, but has no significant effect on older candidate evaluations. The impact of traits is considerably larger, and has the biggest effect on younger candidates, with each associated trait (up to 8) raising their electability rating by 7.7 percentage points. Finally, attractiveness is by far the strongest predictor, increasing evaluations by 19.0 to 31.3 percentage points depending on the candidate's age.

While these results offer support for our statistical discrimination mechanism, the find-

Table 3: Determinants of Candidate Electability by Age

	DV: Electability of Candidate		
	Younger Candidate	Middle-Aged Candidate	Older Candidate
	(1)	(2)	(3)
Estimate of a Candidate's Age	−0.001	−0.004***	−0.005***
	(0.001)	(0.001)	(0.001)
Policy Issues	0.017***	0.021***	0.005
	(0.004)	(0.004)	(0.003)
Traits	0.077***	0.067***	0.046***
	(0.007)	(0.006)	(0.006)
Attractive	0.255***	0.313***	0.190***
	(0.021)	(0.024)	(0.025)
Age of Respondent	0.0002	0.0003	−0.001***
	(0.001)	(0.001)	(0.0005)
Constant	0.017	0.212***	0.374***
	(0.037)	(0.073)	(0.078)
Observations	2,053	1,944	2,003
R^2	0.346	0.429	0.237

Notes: Dependent variable is equal to 1 if respondent said the candidate was likely to be elected mayor, and 0 otherwise. Standard errors clustered by respondent are shown in parentheses. *p<.1; **p<.05; ***p<.01.

ings for estimates of a candidate's age also suggest an effect of taste-based discrimination. Even when controlling for voter inferences about policy issues and traits, as well as voter perceptions of the candidate's attractiveness, middle-aged candidates and older candidates that were seen as older were significantly more disliked compared to those seen as younger. For older candidates, their electability rating dropped on average by 5 percentage points for every 10 years in their age estimate. By contrast, voters did not show any evidence of taste-based discrimination against younger candidates. Those who viewed the youngest models as significantly younger did not view them more negatively, and the point estimate in fact suggests they may have been viewed more favorably.

Lastly, we also find in Model 3 that older respondents were significantly less likely to view older candidates as electable. This matches with our lack of a finding for in-group favoritism in Experiment 1. In other words, not only are older candidates viewed the least favorably, but they tend to be viewed less favorably by older voters.

Together, these results provide some evidence for both statistical and taste-based discrimination. Evaluations based on age about a candidate's issue emphases and traits were positively correlated with whether that respondent saw the candidate as electable. However, for middle-aged and older candidate photos, the respondent's estimate of the candidate's age was still negative and strongly significant even when controlling for these other factors, suggesting a residual dislike of elderly candidates.

Discussion

Young people are significantly under-represented in most political institutions. Our findings in this paper, however, indicate that most voters would be happy to see this age bias corrected. Across our experimental and observational tests, we find that voters are equally supportive of younger candidates as middle-aged candidates, and actually prefer younger candidates significantly more than older candidates.

Our study thus has implications for policymakers interested in expanding younger people's presence in political institutions. We find no evidence that demand-side explanations such as voter biases pose significant hurdles to more young people serving in elected office. While more studies are needed to replicate our results and test the robustness of supply-side explanations, the extant evidence suggests that age biases in institutions can best be adjusted through tackling younger people's lack of political ambition and reforming institutions to make it easier for them to run for office (Shames 2017; Lawless and Fox 2015; Stockemer and Sundstrom 2018; Joshi 2013).

Apart from overall age stereotypes, we also find evidence that voters employ both statistical and taste-based age discrimination in elections. Voters infer clear policy emphases and traits based on a candidate's age, which in turn are linked to their perceptions of the candidate's electability. Younger candidates may not be viewed as having as much experience as other age groups, but they are seen as the most likely to emphasize a wide range of issues in office, from education and childcare to climate change, anti-corruption measures,

and policies that benefit foreign residents and promote multiculturalism. By contrast, we find a sharp drop-off in voter support for candidates as they become elderly: voters described older candidates as less competent than others despite their additional years of experience and saw these candidates as the least likely to focus on any policy issue outside of those most important to elderly voters.

Our results thus add new dimensions to the nascent, but growing literature on age biases. While Pomante and Schraufnagel (2015) find that younger Americans are more likely to turn out when younger candidates are on the ballot, we find in Japan that this is true for all voters when compared to races with only elderly candidates. Younger people do not turn out more when younger people are on the ballot compared to middle-aged candidates, which represent more common mayoral races, but they do turn out significantly less when mayoral candidates are older. As for Webster and Pierce (2019), we find similar evidence of age-group favoritism in our experimental results as they did in their observational study. One caveat of our findings is that this in-group favoritism does not hold for elderly voters, who tend to be more critical than others of elderly candidates.

Our findings also contribute to studies of elections in Japan that have touched on the age of candidates, albeit tangentially. While Horiuchi, Smith and Yamamoto (2020) and Kage, Rosenbluth and Tanaka (2019) find that younger candidates are generally the most liked in races for the House of Representatives, we find that voter preferences are more balanced between younger and middle-aged candidates for mayoral races. We also find much stronger negative biases against older candidates. These differences in our results could reflect our differences in method, but they may also be indicative of the fact that we focus on mayors who are local executives with much greater discretion over policy compared to legislators. Future research is needed to disentangle how age biases might differ across government levels (local vs. national), positions (legislative vs. executive), and levels of policy influence.

Finally, we hope that our new experimental design can inspire additional work on age in other countries and electoral contexts. While conjoint analyses have exploded in popularity

in recent years, no single research design can be a panacea for answering every research question. Moreover, our design only scratches the surface with regard to what is possible in terms of image manipulation via machine learning and neural networks. As these processes grow increasingly sophisticated and accessible to scholars, more research is needed to explore how people react when confronted with realistic-looking representatives (or other political actors) of different ages, as well as how age biases interact with discrimination against other identities, such as gender and race.

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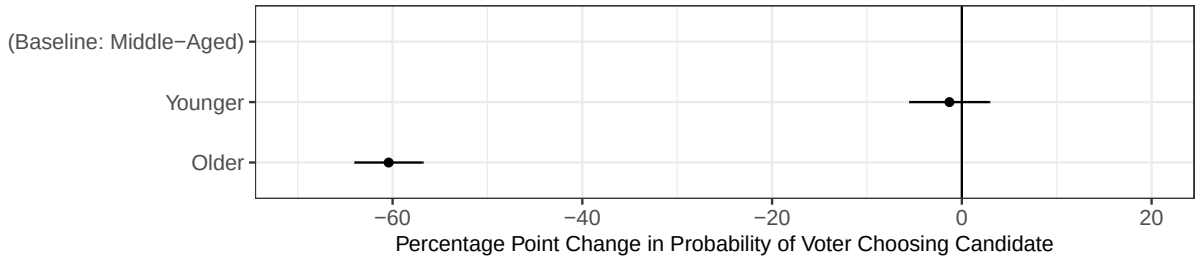
Appendix

Figure A1: Candidate Age and Vote Choice (Likely Voters)



Notes: Dependent variable is equal to 1 if the respondent said they would vote for the candidate, and 0 otherwise. Bars show 95% confidence intervals.