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PAR PUBLIC ADMINISTRATION REVIEW

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Representative Bureaucracy and the Willingness to Coproduce: An Experimental Study

Abstract: *Relying on the theory of representative bureaucracy—specifically, the notion of symbolic representation—this article examines whether varying the number of female public officials overseeing a local recycling program influences citizens' (especially women's) willingness to cooperate with the government by recycling, thus coproducing important policy outcomes. Using a survey experiment in which the first names of public officials are manipulated, the authors find a clear pattern of increasing willingness on the part of women to coproduce when female names are more represented in the agency responsible for recycling, particularly with respect to the more difficult task of composting food waste. Overall, men in the experiment were less willing to coproduce across all measures and less responsive to the gender balance of names. These findings have important implications for the theory of representative bureaucracy and for efforts to promote the coproduction of public services.*

Practitioner Points

- Including more women in an agency's leadership may influence the willingness of female clients or citizens to cooperate with the agency and thus coproduce important policy outcomes, such as recycling.
- Moreover, including more women in leadership does not seem to diminish the cooperation of male clients or citizens, although it does not enhance their cooperation either.

Representative bureaucracy has been the topic of a good deal of research in public management over the past several decades (Andrews, Ashworth, and Meier 2014; Atkins and Wilkins 2013; Bradbury and Kellough 2011; Meier 1993a, 1993b; Meier and Nicholson-Crotty 2006; Meier and Stewart 1992; Park 2013; Wilkins 2007). In general, the theory of representative bureaucracy holds that passive representation—whereby an agency's workforce reflects the demographics of the clients or citizens it serves—helps ensure active representation—whereby bureaucrats respond to the needs and interests of their social counterparts in the general population. More recent scholarship has suggested that passive representation itself may have substantive effects through the alternative mechanism of enhanced trust and cooperation on the part of citizens, a process referred to as "symbolic representation" (Gade and Wilkins 2013; Meier and Nicholson-Crotty 2006; Riccucci, Van Ryzin, and Lavena 2014; Theobald and Haider-Markel 2009). This symbolic representation hypothesis leads to the expectation that citizens will be more willing to cooperate and thus coproduce important outcomes when their gender, race, ethnicity, or even shared identity is represented in a government bureaucracy.

While the primary interest here is examining the effects of representative bureaucracy on recycling behavior, this article also contributes to the literature on coproduction in that it suggests that the passive representation of women in public agencies may be one mechanism to increase at least women's willingness to coproduce public services. In this way, our article makes a contribution by explicitly considering the link between representative bureaucracy and coproduction, two important but hitherto largely unconnected streams of research in public administration. As local governments continue to face fiscal stress and struggle to maintain service quality, identifying new ways to foster coproduction is paramount (see Clark, Brudney, and Jang 2013). This article is also significant theoretically because it seeks to link the potential actions or behaviors of women to gender diversity in public agencies when the policy area is not explicitly gendered, in the sense of not being tied to women's issues or to public programs or services that target women, such as domestic violence prevention, child care, and reproductive policy (Keiser et al. 2002).

Representative Bureaucracy

Since the theory of representative bureaucracy was first advanced by Kingsley in 1944, a systematic body of literature on this topic has been advanced. Mosher

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(1968) explicated the theory by offering a distinction between passive and active representation, where the former exists when the demographic makeup of a bureaucracy reflects that of the general population it is presumed to represent. Several studies have indicated that passive representation leads to diversity gains and can also enfranchise various social groups (Kellough 1990; Kellough and Elliott 1992; Meier 1993b; Riccucci and Saidel 1997; Selden 1997). Active representation links the demographic characteristics of organizations or agencies to bureaucratic behavior and outcomes. Kenneth Meier (see, e.g., Meier 1975, 1993a; Meier and Nigro 1976) was one of the first scholars to empirically examine the linkage between passive and active representation, and he has advanced the theory considerably with his comprehensive body of research (see, e.g., Meier and Bohte 2001; Meier and Nicholson-Crotty 2006; Meier and Stewart 1992; Meier, Wrinkle, and Polinard 1999).[1] Representative bureaucracies promote the legitimacy of governmental goals and policies and, ultimately, democratic governance.

Symbolic representation adds considerably to the theory of representative bureaucracy in that bureaucratic legitimacy increases among clients, notwithstanding bureaucratic behavior or outcomes.

Previous research has argued that certain conditions effectuate the linkage of passive and active representation. As Keiser et al. (2002) argue, for example, bureaucrats must have a certain amount of discretionary authority to develop and implement public policies (see also Andrews, Ashworth, and Meier 2014). They also argue that the policy domain within which the bureaucrats work must be linked to the interests of those being served (e.g., women seeking child support; see Wilkins and Keiser 2006). For women, according to Keiser and colleagues, the policy area must be "gendered," whereby "the policy directly benefits women as a class, . . . the gender of the bureaucrat changes the client-bureaucrat relationship, . . . or the issue has been defined as a women's issue through the political process" (2002, 556).

More recently, a number of studies have examined representative bureaucracy from a symbolic perspective (Gade and Wilkins 2013; Meier and Nicholson-Crotty 2006; Riccucci, Van Ryzin, and Lavena 2014; Theobald and Haider-Markel 2009). These scholars provide evidence that not only active but also passive representation can result in benefits for clients. As Gade and Wilkins suggest, "passive representation can . . . translate into symbolic representation, where representation may change the attitudes and behaviors of the represented client without any action taken by the bureaucrat" (2013, 267). Their research shows that veterans who know or believe that their counselors in the Department of Veterans Affairs are veterans themselves report greater satisfaction with services.

Theobald and Haider-Markel (2009) also examine the symbolic effect of bureaucratic representation. Their findings show that passive representation of African Americans in police departments promotes greater perceived police legitimacy among African Americans in the community. Research by Riccucci, Van Ryzin, and Lavena (2014) using a survey experiment found that increasing the number of women in a hypothetical local domestic violence unit increased perceptions of trust, fairness, and job performance of the agency, particularly among women in their study. This can lead to a greater willingness on the part of citizens to report domestic violence crimes; in effect, citizens are coproducing important public safety outcomes.

Symbolic representation adds considerably to the theory of representative bureaucracy in that bureaucratic legitimacy increases among clients, notwithstanding bureaucratic behavior or outcomes. That is, the attitudes and behaviors of clients are influenced to the extent to which they are passively represented in an agency or department, regardless of whether concrete actions are taken by the bureaucrats. Thus, not simply active representation but also passive representation can produce greater trust in government agencies or increased willingness to coproduce public services.

A recent study by Atkins and Wilkins (2013) found that benefits linked to bureaucratic representation need not be tied to the mission of the organization. They found a linkage between the presence of women or minority teachers and lower teen pregnancy rates, suggesting that outcomes not directly linked to the primary mission of the agency or organization can still be influenced by representativeness. This finding offers a new development to the theory of representative bureaucracy. So, too, does a recent study by Andrews, Ashworth, and Meier (2014), which addresses the significance of representative bureaucracy for coproduction. Their research indicates that the representation of women and ethnic minorities in fire services in England was linked to organizational effectiveness. They further found, however, that performance impacts were greater in non-mission-specific tasks that presented additional opportunities for coproduction; for fire services, this includes, for example, rescuing cats from trees, an outcome that is highly valued by local communities. Andrews, Ashworth, and Meier point out that those areas "with greater opportunity for coproduction are where one would expect to see representative bureaucracies perform better" (2014, 8).

Our study adds to this line of research by using an experimental method to probe gender representativeness effects on coproduction and by focusing on a policy area in which the program and service is not targeted specifically to women. In effect, we raise questions as to whether the policy area must be gendered in order to demonstrate representativeness effects. Also, we look at an area in which mission as well as *outcomes* are not specifically linked to gender, race, ethnicity, or shared identity. This has great significance for the willingness of women to coproduce local government services, which is becoming increasingly important in the wake of fiscal crises facing local governments. As Clark, Brudney, and Jang point out,

> Recent years have witnessed local governments on the brink of employee layoffs, major cutbacks in services, and even bankruptcy. In the current economic climate, it has become more important for local governments to find ways to reduce their budgets yet still deliver the level and quality of services to which residents have become accustomed. One method increasingly employed is coproduction, whereby government engages citizens as partners in service delivery. (2013, 687)

Thus, this article examines the link between gender representativeness and the willingness of citizens to coproduce in a policy area of growing importance to our crowded planet: recycling.

Recycling and Coproduction

Recycling waste products of any type requires close cooperation on the part of the citizenry. Governments can develop programs to dispose of waste in various ways, but the success of those programs depends greatly on the recycling decisions and behaviors of citizens. Effective recycling obviously has significant implications for our current as well as future natural environment, and it is vital in efforts to create sustainable communities. As research has shown, the overall benefits outweigh the costs; recycling leads to a reduction of waste and reduces pollution, the need for landfill disposal, and energy demand. By recycling hard plastics, for example, new products can be manufactured without expending energy to extract and process raw materials (Nielsen 2011; Worrell and Reuter 2014). By composting food waste, useful topsoil is produced for land restoration and agriculture, and there is less pressure on landfills as well as reduced air pollution from incineration (Levis et al. 2010).

The U.S. Environmental Protection Agency (EPA) reports that in 2012, Americans generated about 251 million tons of trash; around 12.7 percent of that was plastic waste. In 1960, plastics represented less than 1 percent of waste (EPA 2014a, 2014b). On average, we generate individually around 4.4 pounds of waste per day. We recycle and compost only around 1.5 pounds of this waste (EPA 2014a). Although we think of recycling as a relatively new phenomenon, it has been around for hundreds of years. Earth Day, April 22, 1970—now celebrated worldwide annually—marked the onset of the modern environmental movement. It was largely a nationwide demonstration to raise awareness of the importance of conservation and preservation of the planet. Early recycling programs targeted such products as soft plastics and aluminum (e.g., cans), but it was not until the late 1980s that curbside collection of recyclables was introduced (see, Hopewell, Dvorak, and Kosior 2009; Weinberg, Pellow, and Schnaiberg 2000).

Composting and hard plastics recycling represent more recent efforts in the environmental movement. For example, New York City's expansion of its recycling program to include hard plastics and composting commenced in April 2013. Hard plastics include such items as plastic CD or DVD cases, prescription bottles, plastic toys, yard furniture, shampoo bottles and food containers. Hard plastics do not include water bottles, Styrofoam, plastic bags, or shrink wrap. Items for composting include fruits and vegetables, grains, bread, dairy products, meat, bones, eggshells, tea bags, and coffee filters. Items that cannot be composted include plastics, glass, and metals. New York City estimates that it could save as much as $60 million a year through composting and hard plastics recycling (Chaban 2013; Newman 2013).

Coproduction, broadly defined, includes any activity in which citizens directly cooperate with public or private agencies as well as other citizens in the production or delivery of public services (see Brudney 1987).[2] As Brudney and England (1983) point out, the coproduction of any government service will not only reduce costs but also enhance the quality and quantity of services received by the citizenry (also see Alford 2002; Levine and Fisher 1984). They argue that "by supplementing—or perhaps supplanting—the labors of paid public officials with the service-directed activities of urban dwellers, coproduction has the potential to raise both the quality and efficiency of municipal services" (Brudney and England 1983, 59). Recycling and composting are areas that obviously lend themselves to coproduction. Parrado et al. (2013) report that citizens may be more willing to coproduce a better environment if relevant incentives are present. The belief that tax relief may result from recycling, for example, would be an important incentive. The appointment of block leaders in neighborhoods may also lead to greater coproduction in the form of recycling behaviors (Bovaird 2007). Citizens may also be willing to coproduce because of personal traits (Sundeen 1988), moral convictions (Wise, Paton, and Gegenhuber 2012), or a feeling of contributing to a cause (Bovaird et al. 2015).

The coproduction of any government service will not only reduce costs but also enhance the quality and quantity of services received by the citizenry.

Another incentive, at least for women, might be the presence of female officials in the leadership ranks of environmental programs. This may lead to substantive change in the actions or behaviors of women in the citizenry that might not otherwise be influenced in the absence of passive representation. This is critical, particularly when we consider recycling from a household perspective. MacBride (2012) points out that the United States has made tremendous headway in its efforts to recycle, and it has generated widespread public support. Its efficacy, to be sure, depends on the willingness of citizens to coproduce.

Aims and Expectations

As mentioned earlier, previous research on symbolic representation has found that clients' *attitudes* can change to the extent that their social group is passively represented in an agency. Our study attempts to demonstrate that the potential *behaviors* of clients (or at least *behavioral intentions*) can also be affected. In this sense, passive representation may promote coproduction of services. Specifically, we examine whether women will be more willing to recycle and hence coproduce environmental outcomes if women officials are better represented in the programs or agencies charged with recycling and composting.

Our expectation is that women's willingness to coproduce will increase as the respective government agency includes a greater percentage of women in its leadership ranks (in other words, a positive dose–response relationship). With respect to men, our expectations are less certain. Although we do not anticipate an increasing willingness of men to coproduce when the agency's leadership includes more women, neither do we expect a negative response. Thus, our analysis of the effect of gender representation on men's coproduction behaviors remains exploratory.

Experimental Design and Participants

To test these expectations, we designed an online survey experiment in which we presented participants with an experimentally manipulated announcement about a local recycling initiative and then asked them about their willingness to coproduce. Although artificial in the sense of relying on a hypothetical scenario, this kind of fully randomized experiment has the distinct advantage of high internal validity (Shadish, Cook, and Campbell 2001), thus allowing firm cause-and-effect conclusions about the influence of

representative bureaucracy on citizens' behavioral intentions. The announcement (see appendix A for the full text) was based on an edited compilation of similar announcements made by city government administrations in the United States in recent years (see, e.g., New York City Office of the Mayor 2013). The recycling initiative described in the announcement included both hard plastics and composting, which is a more labor-intensive form of recycling that involves separating food scraps and other organic materials and saving them in a special bin for weekly curbside pickup.

The experimental manipulation of gender representativeness was straightforward: we randomly varied the first names of four public officials and administrators quoted in the announcement (in order of presentation): the mayor, the sanitation commissioner, the deputy mayor for operations, and the director of organics recycling. For example, the sanitation commissioner was named either William Smith or Linda Smith; such variation in first names of the four government officials was the only difference across treatment groups (see appendix A for the name variations). For the first group of randomly assigned participants, all four officials had male names; for the second group, two officials had male names and two had female names; and for the third randomly assigned group, all four officials had female names. The experimental design is presented graphically in figure 1. The names were selected from among those given and surnames that are most common in the United States (U.S. Census Bureau n.d.). For the group that was shown two male and two female names, the combinations of officials with male and female names were randomly varied (so that it was not always the mayor and sanitation commissioner, for example, who had the male names).

For ethical reasons, we did not deceive participants into thinking that the announcement referred to a real recycling program in their community. Rather, we simply instructed them to "read the announcement and consider the information carefully *as if this were* a real initiative in your own local community" (emphasis added). After the presentation of the announcement, participants were asked the following question:

Having read this information—and imagining this was a real recycling initiative in your city or town—how willing would you be to . . .

- *Collect shampoo bottles, plastic hangers, bottle caps, and other rigid plastics for recycling [hard plastics]*
- *Put coffee grounds, filters, and tea bags in a brown organics recycling bin to save for weekly pickup [light composting]*
- *Put eggshells, meat, fish, and bones in a brown organic recycling bin to save for weekly pickup [heavy composting]*

Participants could indicate responses ranging from 0 ("not willing at all") to 100 ("completely willing") using a horizontal slider. As noted in the brackets (which were not shown to participants), we designed the indicators to reflect a gradation of recycling difficulty and effort from hard plastics to light composting (coffee grounds, tea bags) to heavy composting (meat, fish, bones).

Participants were adult respondents to an e-mailed study invitation sent to individuals in the CivicPanel project, a university-affiliated Internet research panel. CivicPanel recruits on an ongoing basis using regular web directory listings, social media, Craigslist, and Google ads and includes panelists of various ages and income levels from all parts of United States as well as other countries. Data were collected online during January 2014 in response to an e-mailed invitation to 10,642 panelists; 2,321 opened the e-mail message (representing a contact rate of 22 percent), and 1,114 completed the questionnaire (representing a cooperation rate of 48 percent and an overall panel response rate of 10 percent). Because of the nature of the information presented in the experiment (which was based on U.S. local government examples) and our interest in generalizing our findings to the U.S. context, we excluded 377 respondents who lived outside the United States.[3] We also excluded an additional 4 respondents who completed the survey in less than 60 seconds (and thus were unlikely to have read the announcement fully). This left us with $n = 733$ eligible participants in our final analytical sample (although item nonresponse resulted in somewhat smaller samples for specific analyses, as reported in the tables).

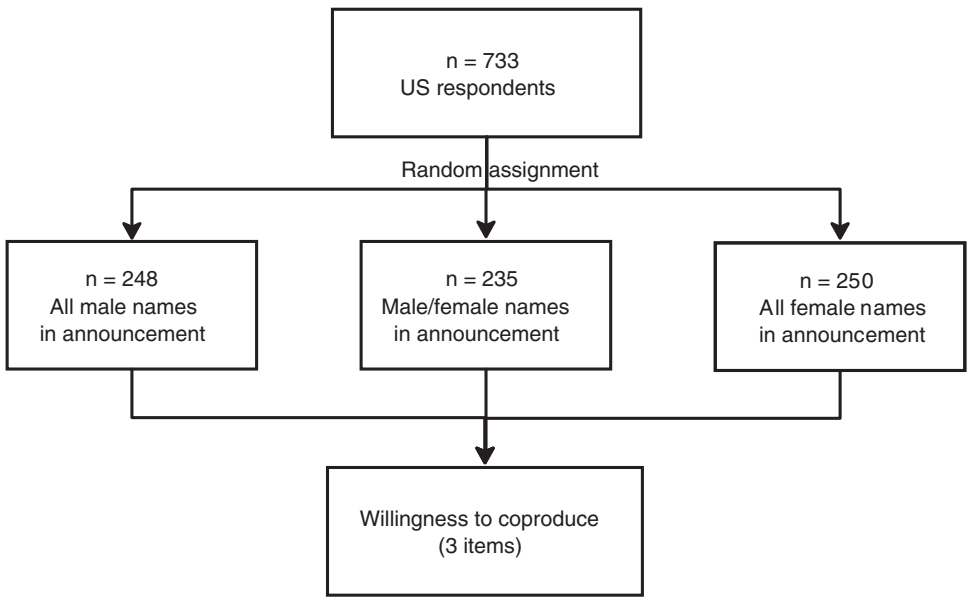


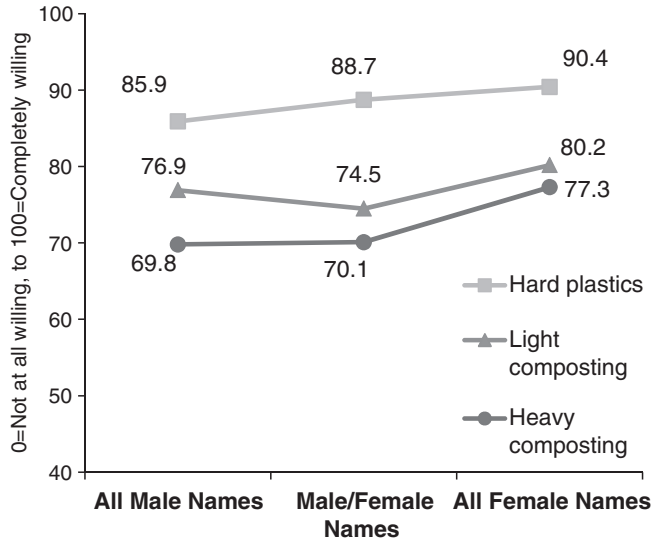
Figure 1 Experimental Design

The low overall response rate is not unusual for online surveys (Dillman, Smyth, and Christian 2014), and, as mentioned, the panel represents a pool of volunteers who were not randomly sampled to begin with. Indeed, the vast majority of experimental studies in psychology, economics, and political science rely on voluntary, nonprobability subject pools (Morton and Williams 2010; Shadish, Cook, and Campbell 2001).

It is important for purposes of external validity to compare the characteristics of the study's participants with those of the U.S. adult population, which we do in appendix B using data from the American Community Survey (U.S. Census Bureau 2015) and Gallup (n.d.). Compared with the U.S. population, participants are somewhat more likely to live in the regions of the Northeast and the South and less likely to live in the Midwest and especially the West. Demographically, the sample is disproportionately female (66 percent) and mostly white, non-Hispanic (79 percent), which is slightly higher than the 74 percent white, non-Hispanic in the U.S. population. The age distribution of participants is fairly similar to the U.S. population, but with more study participants in the middle age range (35–64) and fewer in the younger and older age categories. The income distribution generally parallels the U.S. population, but with somewhat more participants in the middle income category ($25,000–$74,999) and somewhat fewer in the upper income category ($75,000 or more). Participants represent a range of political views, but compared with the Gallup Poll, they are somewhat more liberal than the U.S. population (see appendix B). In sum, although our sample remains a voluntary, nonprobability sample that is not statistically projectable to the population, participants reflect a variety of geographic regions, demographic characteristics, and political orientations that are not greatly divergent from those of the U.S. population (see appendix B).

Analysis and Results

Because of our interest in gender representativeness, which obviously has different meanings for women and men, we present our experimental findings in this section separately by gender. The graphical presentation of results is included in this section; the corresponding regression details and significance tests are provided in appendix C.



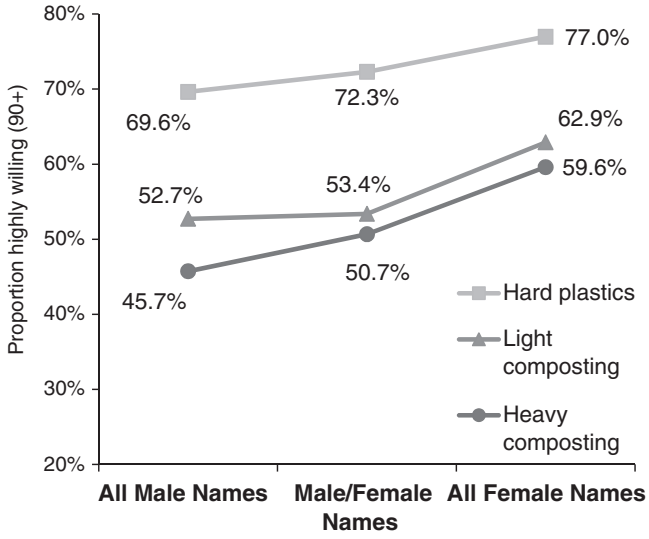
Note: See appendix C for regression analysis and significance tests.

Figure 2 Women's Mean Willingness to Recycle

Figure 2 shows women's mean willingness to recycle hard plastics and do light and heavy food composting on the 0–100 scale described previously. The trends for all types of coproduction are positive, with women in the study reporting a greater willingness to recycle as the names of government officials in the announcement become increasingly female. For hard plastics, the increase is relatively modest but still statistically significant ($p < .10$), with an increase of 4.5 scale points in willingness when all officials are women compared with when they are men (see appendix C for corresponding regression details). For light composting, the trend is flatter and not statistically significant, but still the willingness to coproduce is about 3 points higher when all officials are women compared with when all are men. The increasing willingness to coproduce is more evident and also statistically significant ($p < .05$) for heavy composting, the most arduous and unpleasant type of recycling. Women in the study expressed 7.5 scale points more willingness to compost food when all officials have female names compared with when all officials have male names.

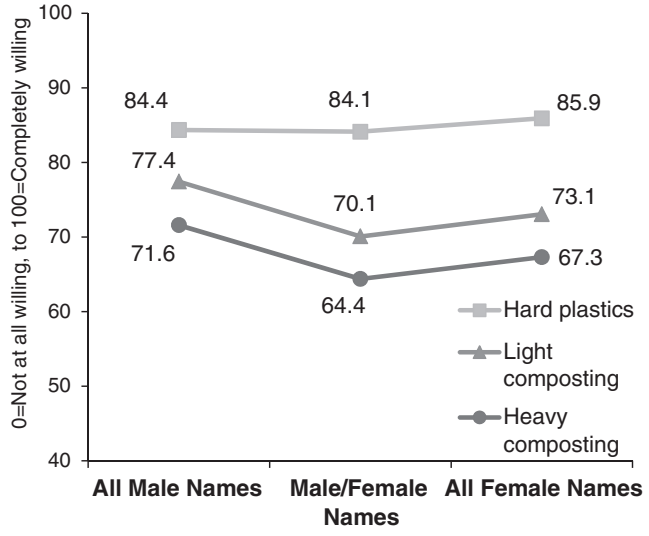
Importantly, the willingness to recycle hard plastics and to do light and heavy composting, measured on the 0–100 scale, is highly left-skewed, as shown in appendix D. That is, a large percentage of participants expressed a very high degree of willingness overall to coproduce, which is not unexpected given that the public generally favors and engages in recycling (Ipsos 2011). Social desirability bias most likely accounts for part of the left-skewness in responses. As a result, any analysis of means may be influenced a great deal by the relatively few participants on the left tail of the distribution (those expressing very low levels of willingness). Yet, substantively, we are interested in whether gender representativeness might encourage women to move to the very top of the distribution, perhaps the best signal of their behavioral intention to actually engage in coproduction. For these reasons, we created a dummy variable for being highly willing to coproduce, defined as having a score of 90 or above. This corresponds to the top-two box scoring method widely adopted in studies of consumer behavior (Allen and Rao 2000), which also confronts the problem of analyzing left-skewed distributions. Applying this measure to the sample as a whole, the rate of those highly willing to coproduce is 68 percent for hard plastics, 52 percent for light composting, and 47 percent for heavy composting.

As figure 3 shows, there is a distinctly positive trend in the proportion of women highly willing to coproduce as the names of government officials in the announcement become increasingly female. For recycling hard plastics, the percentage of women who are highly willing to coproduce increases from about 70 percent (when shown all male names) to 77 percent (when shown all female names), although this gain is not statistically significant. For light composting, the rate of women highly willing to coproduce increases a full 10 points when the officials in the announcement have all female names, compared with all male names, a marginally significant gain ($p < .10$). Most notably, the percentage of women highly willing to do heavy composting increases from about 46 percent to nearly 60 percent, a substantial gain in willingness that is clearly statistically significant ($p < .05$, see appendix C). Thus, as figure 3 shows, the announcement with all women officials has its largest effect on the percentage of women who are highly willing to do heavy composting, the more arduous and unpleasant form of coproduction.



Note: See appendix C for regression analysis and significance tests.

Figure 3 Proportion of Women Highly Willing to Recycle (90+ willingness)

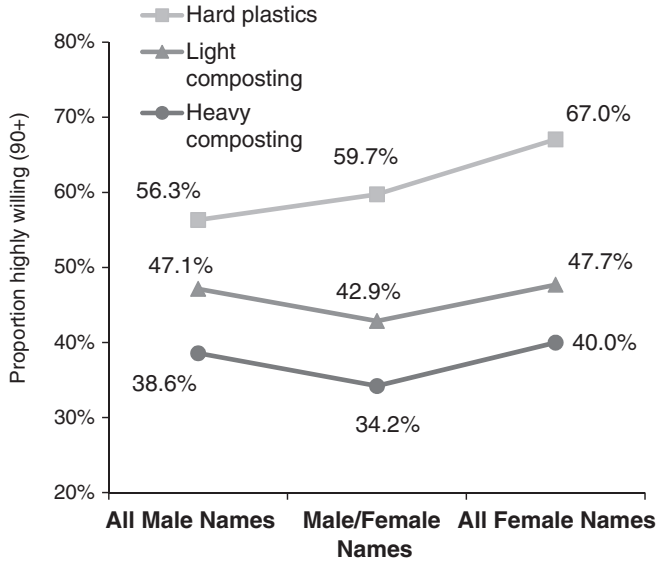


Note: See appendix C for regression analysis and significance tests.

Figure 4 Men's Mean Willingness to Recycle

Thus far, we have focused only on women participants. How did the men in the study react to the increasing presence of female government officials in the agency responsible for recycling? Figure 4 shows the mean willingness of men in the study to recycle (on the 0–100 scale); the data show that the trends are essentially flat or slightly negative. As the number of female government officials increases, men's willingness to recycle hard plastics does not change much at all. With respect to both light and heavy food composting, men appear slightly less willing to coproduce when the government officials are female, although neither decline is statistically significant.

An interesting and somewhat surprising pattern emerges in figure 5, which shows the proportion of men who are highly willing to



Note: See appendix C for regression analysis and significance tests.

Figure 5 Proportion of Men Highly Willing to Recycle (90+ willingness)

coproduce (defined as 90 or more on the 0–100 scale, as explained earlier). For the less difficult task of recycling hard plastics, the percentage of men highly willing to coproduce actually increases by more than 10 percentage points in the group with all females names compared with the group with all male names, although this increase is not quite statistically significant (see appendix C). For the more difficult and unpleasant tasks of light and heavy composting, however, the percentage of men highly willing to coproduce changes very little as the number of female names of government officials increases.

Because the three treatment groups can be viewed as having been exposed to different "dosages" of female names, we ran additional regressions in the form of a dose–response relationship and present these analyses in table 1. We coded the independent variable (*Dose*) 0 for all male names, 0.5 for half male and half female names, and 1 for all female names to represent the proportion of female names in the announcement. Thus, the regression coefficients on this dosage variable represent the linear trends seen in figures 2–5 and provide a summary of the overall pattern of results. The table also shows the percent change (Δ) in willingness to coproduce, which aids in the interpretation of the substantive significance of the effects.

> Mean willingness to coproduce increases with the dosage of female names for women participants in the study but not for men.

As table 1 shows, mean willingness to coproduce increases with the dosage of female names for women participants in the study but not for men. For women, being exposed to all female government officials (compared with all male officials, which is captured by the constant) results in a 5 percent increase (Δ) in the willingness to recycle hard plastics, a 4 percent increase in the willingness to do light composting, and a nearly 11 percent increase in the willingness to do heavy composting. With respect to the proportion of people highly willing to coproduce (again defined as 90 or more on the 0–100 scale), the dosage of female names has a fairly large (but statistically insignificant) positive influence on the willingness

Table 1 Dose–Response Regression Analysis

	Dose (0/0.5/1)	Constant	R^2	Obs.	Dose as Δ from Constant
Mean willingness (0–100 scale)					
Hard plastics					
Females	4.53*	86.08	0.007	468	5.3%
Males	1.63	84.00	0.001	236	1.9%
Light composting					
Females	3.15	75.67	0.002	464	4.2%
Males	–4.01	75.53	0.003	233	–5.3%
Heavy composting					
Females	7.40*	68.75	0.008	463	10.8%
Males	–3.97	69.76	0.002	231	–5.7%
Proportion 90+ in willingness					
Hard plastics					
Females	0.07	0.64	0.005	468	11.4%
Males	0.11	0.56	0.008	236	19.5%
Light composting					
Females	0.10*	0.51	0.007	464	19.6%
Males	0.01	0.45	0.000	233	1.9%
Heavy composting					
Females	0.14 **	0.45	0.013	463	30.6%
Males	0.02	0.37	0.000	231	4.8%

Notes: Ordinary least squares regressions, unstandardized coefficients shown. The independent variable Dose is coded 0 for all male names, 0.5 for half male and half female, and 1 for all female names.

*$p < .10$; **$p < .05$ (two-tailed test).

to recycle hard plastics for both women and men. For the more difficult tasks of light and heavy composting, in contrast, the dosage of female names has a very large effect on women only, and little effect at all on men. Specifically, the proportion of women highly willing to do light composting increases 20 percent (Δ)—and for heavy food composting increases more than 30 percent—when the announcement includes all female government officials compared with when the government officials are all male.

Discussion and Implications

Using an experimental design, our study provides evidence in support of the symbolic representation hypothesis. Specifically, we find that women are more willing to cooperate with government, and hence coproduce important policy outcomes, when the government officials and administrators involved are women. Moreover, the substantive effect is large, particularly for the more labor-intensive forms of coproduction: a 20 percent increase in the willingness of women to do light composting and a more than 30 percent increase in their willingness to engage in heavy food composting when the public officials are all female, as contrasted with all male. These results suggest that the effects of symbolic representation on citizens' willingness to coproduce may be an important causal mechanism behind previously observed correlations between representativeness and policy outcomes. Moreover, this article offers an important contribution to the literature on representative bureaucracy by showing that the policy area or mission of the agency need not be gendered for such representation effects to emerge. Nor is a shared identity with the agency a motivating factor in this case. Our findings also suggest a clear link between representative bureaucracy and coproduction, two heretofore largely unconnected areas of research in public administration.

The effects of symbolic representation on citizens' willingness to coproduce may be an important causal mechanism behind previously observed correlations between representativeness and policy outcomes.

We also found that men are generally less affected by the increasing presence of women in the scenario, except they appear somewhat more willing to recycle hard plastics when the public officials have female names, although the overall trend is not statistically significant. Interestingly, there is no such positive effect on men's willingness to engage in light and heavy composting, suggesting that the presence of female officials does not trigger any willingness to cooperate in these more arduous and unpleasant forms of recycling. It should be noted there is little evidence either that the presence of women in the ranks of public officials discourages men in any significant way. Thus, we interpret this pattern of findings as suggesting that greater gender diversity may in some cases produce positive effects for everyone in the society, which is significant given the general underrepresentation of women in government leadership positions. This corresponds with the findings of Riccucci, Van Ryzin, and Lavena (2014), who found that increased representation of women in domestic violence units increased women's and men's combined perceptions of the job performance, trustworthiness, and fairness of the agency (see also Zenger and Folkman 2012). Further research on gender differences in representation effects is needed.

It is important to acknowledge some limitations of our study. Although our experimental design provides good causal evidence, both the representativeness manipulation and the behavioral response are admittedly artificial. That is, we presented respondents with a hypothetical scenario, and we asked about their behavioral intentions but did not observe their real behaviors. Thus, it remains somewhat uncertain how people's actual recycling behavior would respond to variations in the real gender composition of their own local governments. Another limitation of our study lies in its reliance on a voluntary, online sample, which is not statistically generalizable to the U.S. population. However, our sample does represent a geographically diverse pool of participants from across the United States with varied socioeconomic characteristics and political orientations not too dissimilar from the general population. Certainly, it would be useful to replicate our study with different samples or in different settings. For instance, observational studies, including both quantitative and qualitative approaches, would provide additional insights on whether the representation of women in agencies responsible for recycling might influence the actual recycling behaviors of women in the community. It may also be possible to conduct field experiments in which real recycling behavior can be observed, although manipulating the gender representativeness of real agencies would be difficult.

Our research is also limited in the sense that it focused on only one policy domain, recycling, which is a generally popular policy in the United States (Ipsos 2011). To test the generalizability of our findings, future research might also look at other "nongendered" areas in which coproduction is important, such as public safety, energy conservation, or disaster preparedness. In addition, while we focused on individual coproduction behaviors, it would be interesting and useful to examine representation effects on more collective forms of coproduction, such as joining with others in various group activities related to planning and implementing public services, especially given that levels of collective coproduction are generally much lower

(Bovaird et al. 2015). Also, we focused only on gender representation, so it is important to extend this line of investigation to racial and ethnic representation in government and its potential effects on recycling or other forms of coproduction.

Finally, as discussed earlier, the importance of recycling cannot be overstated. The amount of waste that we produce grows exponentially each year, and the costs of disposing of this waste are becoming an increasing financial and logistical burden on cities. Moreover, the task of recycling is a major element in the larger project of creating a cleaner and more environmentally sustainable world. And as MacBride (2012) points out, companies that produce products that result in waste have been successful at setting up obstacles to the implementation of aggressive public policies aimed at recycling. Thus, encouraging citizens to coproduce in the form of recycling behaviors is paramount. The representation of women in agencies responsible for recycling may represent a previously unrecognized way to encourage this vital form of coproduction.

Notes

1. See also Thompson (1976), Rosenbloom and Featherstonhaugh (1977), Sowa and Selden (2003), Riccucci and Meyers (2004), and Wilkins (2007).
2. See also Bovaird and Loeffler (2012) and Bovaird et al. (2015), which entail other aspects of coproduction, such as collective initiatives and codesign.
3. The nationality of panelists was not fully known in advance. The other countries in the raw sample included (in order of descending frequency): India, Philippines, United Kingdom, Canada, Turkey, Australia, and numerous other countries with only a few respondents. Although it would have increased our sample size, including participants from these countries complicates the generalizability of the experimental results. We repeated all of the analyses reported here for the full sample, including all countries, and obtained similar results.

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Appendix A: Text and Image from the Survey Experiment

On the following page, you will read an announcement and learn about a local recycling initiative. Read the announcement and consider the information carefully as if this were a real initiative in your own local community.

Mayor **[John/Jane] McGill,** Sanitation Commissioner **[William/Linda] Smith,** and other city officials today announced the expansion of the city's recycling program to include rigid plastics as well as composting.

The expansion of rigid plastic recycling—including toys, hangers, shampoo bottles, coffee cups and food containers—is part of the city's Solid Waste Management Plan. The expansion will result in tons of plastic waste no longer ending up in landfills each year and will save taxpayers thousands of dollars in costs associated with exporting garbage. "Residents just need to add rigid plastics to the metal, plastic and glass recycling bins they're already using," explained Deputy Mayor for Operations [**Michael/Mary**] **Anderson**.

The city will also expand food waste composting, which is part of the city's Organics Recycling Plan. Homes in the city will receive a special starter kit, which includes a brown organics bin and a small kitchen container with a starter supply of approved compostable liners. The organics from the kitchen container can be placed in the larger brown organics bin that has wheels and a lid and a locking latch to lessen infestation. "Residents should place their organic materials in the brown container at curbside on their recycling day for collection each week," said Director of Organics Recycling [**George/Susan**] **Davis**. If successful, food waste composting is expected to cut the amount of garbage sent to the city's landfills by almost half.

Appendix B: Respondent Characteristics by Arm and in Comparison with the American Community Survey and Gallup Poll

	American Community Survey /Gallup	Total Sample (n = 733)	Arm 1: All Male Names (n = 248)	Arm 2: Male/Female Names (n = 235)	Arm 3: All Female Names (n = 250)
Northeast	17.7	34.5	38.9	31.1	33.3
Midwest	21.3	16.5	15.8	18.3	15.5
South	23.5	29.4	28.3	31.5	28.5
West	37.6	19.6	17.0	19.2	22.8
Male	49.2	33.7	29.6	34.5	36.9
Female	50.8	66.3	70.4	65.5	63.1
White, non-Hispanic	73.7	79.3	78.8	80.0	79.3
Other	26.3	20.7	21.2	20.0	20.7
18–34 years old	29.3	21.3	24.4	20.4	19.0
35–64 years old	52.0	66.6	65.9	65.8	68.0
65 and older	18.7	12.2	9.8	13.9	13.0
Less than $25,000	16.4	17.0	17.3	17.5	16.3
$25,000–$74,999	41.2	49.9	48.9	50.2	50.6
$75,000 or more	42.5	33.0	33.8	32.3	33.1
Liberal	23.0	34.1	35.7	31.4	35.1
Moderate	34.0	40.1	38.1	42.4	40.0
Conservative	38.0	25.8	26.2	26.2	24.9

Notes: Table shows percentage points. No significant differences by arm at the $p < .10$ level. Population data in the first column are from the American Community Survey (2015) and Gallup (n.d.).

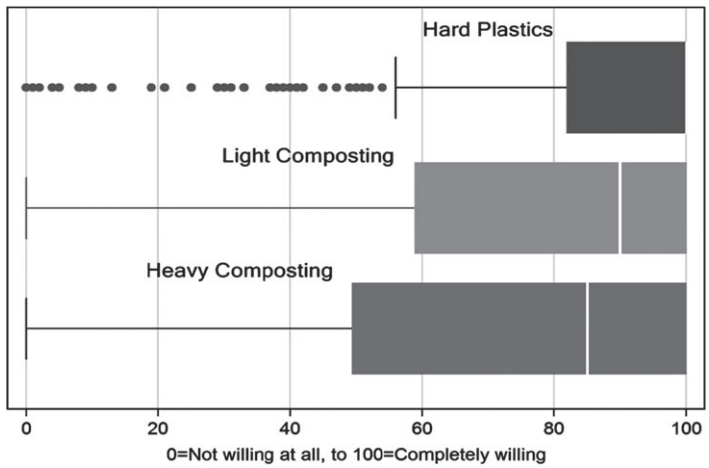
Appendix C: Regressions Corresponding to Figures 2–5

	Women		Men	
	Mean Willingness (Figure 2)	Proportion 90+ (Figure 3)	Mean Willingness (Figure 4)	Proportion 90+ (Figure 5)
Hard plastics				
All female	4.52*	0.073	1.55	0.107
Male/female	2.82	0.027	–0.24	0.034
Constant	85.91	0.696	84.37	0.563
R^2	0.008	0.005	0.001	0.009
Obs. (n)	468	468	236	236
Light composting				
All female	3.27	0.102*	–4.36	0.005
Male/female	–2.42	0.007	–7.35	-0.043
Constant	76.90	0.527	77.43	0.471
R^2	0.005	0.009	0.009	0.002
Obs. (n)	464	464	233	233
Heavy composting				
All female	7.49**	0.139**	–4.29	0.014
Male/female	0.30	0.049	–7.21	-0.044
Constant	69.80	0.457	71.60	0.386
R^2	0.010	0.013	0.007	0.003
Obs. (n)	463	463	231	231

Notes: Ordinary least squares regressions, unstandardized coefficients shown. The group that was shown all male names is the reference category (constant).

*$p < .10$; **$p < .05$ (two-tailed test).

Appendix D: Boxplots of Willingness to Recycle (0–100 scale)



Notes: All three distributions are highly left-skewed. The shaded boxes show the middle 50 percent of the distribution, with the median represented by the white line inside the box. For hard plastics, no white line is visible because the median is 100.