Digital Segregation: Gender, Occupation and Access to Politics

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Abstract: In the United States, women often show less interest in politics, and under some conditions, perform worse on political knowledge tests than do men. In an age where education levels have reached parity, we suggest one of the explanations for the gender, race, and class differences in political engagement might be due to selection of occupation. Past research has shown women and men segregate/self-select into occupations due to early gender socialization, differences in interest, and structural barriers. It is possible due to these segregation effects, that women and people of color in traditional female occupations (e.g. education, health care, service work) may have less access to personal internet use and news sources during their work days. Using the 2014 General Social Survey, we create a new occupational typology based on access to the internet to explore whether individuals in certain sectors differ in their political engagement and how these occupations are also divided by gender, race and class. Then we apply the technology use measure to the 2016 American National Election Study to test whether access at work is associated with political knowledge. This approach offers some insight into how we think about the consequences of work on the relationships between class, gender and race in politics.

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Full-time working Americans spend a lot of time at their place of employment. There is speculation and some measure of the veritable water cooler by which workers chat, learn, network with their peers, bosses, subordinates. Network analysis has captured some of this in questions about with whom Americans have discussed politics. But for the rest of social science, the workplace and associated occupation serve as a code, a socio-economic measure, a secondary/third/fourth identity to what we assume happens in other parts of a person’s life. For some Americans, the workplace is an extension of their personal lives. They are friends with co-workers or there’s a work/social life overlap. They can take personal phone calls, check email, browse Facebook or Instagram, catch up on the latest news from time to time or at least over the lunch hour. For many others, the time at work may feel like a cave away from the outside world – one from which people emerge to find an event of great significance has taken place -- a friend has had a baby or a president has made another social media declaration. As social scientists, we rarely account for the digital communication that happens between 8 and 5, or 2 and 10, or 11 and 7. Are there differences between those that remain connected at work, at home and at play versus those that have limited or no access to the internet for up to 8 hours a day? We also know that occupations are segregated by class, race, and gender – could this also tell us more about why differences in political interest, knowledge and engagement could persist across these groups?

Certainly, occupational prestige and “choice” could represent a proxy for status, income, education, and certain types of identity. But what if the very nature of particular jobs preclude their workers from engaging in outside matters during working hours? Individuals may seek out education, social work or health care as a way to “make a difference,” yet these very same sectors may disallow personal engagement on the job. School teachers often joke about scheduling in bathroom breaks, and there are often strict rules about using computers for personal purposes. Add to this effect that women tend to occupy these roles, and the moment they leave they start their
“second shift” as wives and mothers, and who has time to check Twitter? Read CNN? Follow the links someone posted to Facebook? In the words of a teacher with small children, “maybe women just don’t have the time or energy to worry about politics.”

So what’s going on with occupation? We measure it, extensively. It’s coded pedantically, but who actually looks at how it affects political engagement? We attempt to address this gap in political access by first using the 2014 General Social Survey to define the extent to which occupational groups have access to the internet or technology at work and how this breaks down by gender. Then we apply the technology use measure to the 2016 American National Election Study to test whether access at work is associated with political knowledge.

**Occupational Selection and Segregation**

From an early age, boys and girls learn how to behave according to their ascribed gender roles, usually because those around them tend to classify as a specific sex before engaging with them (Ridgeway 2009). Similarly, sex segregation can emerge quite early in the path to many careers (Correll 2001). It may seem that men and women are making their own choices when it comes to occupation but they could be involuntarily led into specific occupations because of their socialization as a child (Ridgeway 2009). As adolescents, we develop interests that help influence the classes we take as we reach higher education and help us determine which occupation to select once we enter the work force. Sex differences persistently emerge in the reasoning for why women and men choose their specific occupations (Su, Round and Armstrong 2009). For example, women often show interests in social and artistic activities, and men are drawn or encouraged in scientific, technical, and mechanical activities (Su, Rounds and Armstrong 2009). Since women enjoy working with people more then things (Su, Rounds, and Armstrong 2009), they tend to pursue with majors/fields of study that match those interests (Correll 2001).
In the past several decades, however, women have begun to make the transition into certain male-dominated occupations. This shift is not necessarily related to a change in female curiosities as evidence still shows that men and women continue to have different educational and occupational interests (Su, Rounds and Armstrong 2009), but instead from women attempting to bypass the “glass ceiling” set in female-dominated industries. In order for women to continue up the ladder of mobility, many of them have to either make a career change or go back to school. A nurse cannot be promoted to a doctor, an elementary school teacher cannot work her way up to principal, and a social worker cannot become a supervisor or counselor without more education/degrees. England (2010) suggests if it weren’t for the “glass ceiling” in traditional female occupations, women would stay in their line of work instead of changing to a male-dominated field. This occupational change more often than not forces women to move backwards on the ladder of success, having to prove themselves worthy to move up once more in a new field.

Currently, desegregation has stalled in the workforce. Women continue to become lawyers, doctors, and accountants, but remain underrepresented in STEM. Even when women do get their education in a STEM field, they do not enter traditional STEM jobs after graduation. For instance, in 2014, 74 percent of graduates in the STEM field did not work in STEM occupations, and these individuals tended to be women¹, and men continue to be overrepresented in engineering and computer science. Since STEM occupations require specific degrees, researchers have wondered if the selection to go into STEM actually occurs early on in our educational careers (Correll 2001). For example, by high school, boys are more likely to show an interest in math and science than girls and tend to be enrolled in more advanced math and science glasses (Correll, 2001).

Going further with our research, we looked closely at the affect race has on occupation selection. Sex is actually a bigger contributor in occupational segregation than race is in the

workforce. In fact, occupational sex segregation is almost twice the level of occupational racial segregation (Mandel and Semyonov 2016). African-American women face the same kind of occupational obstacles that white women face; however, due to the fact that African-American women are more likely to be unmarried and in single-income households, they have more to lose than to gain in a career shift or going back to school and often times stay in the public sector industry (Mandel and Semyonov 2016). Men and women seem to have different interests and socialization paths, whether obtained voluntarily or involuntarily, that lead them to pursue certain occupations. Although we continue to move towards a less segregated workforce, women still remain underpaid and overlooked in their occupations. Female-dominated occupations are still viewed through a lower status lens and hold less prestige than traditional male occupations. This stigma exists despite the fact that women are graduating at the same rates, holding higher degrees, and work in higher-skilled jobs than men (Hegewisch, Liepmann, Hayes and Hartman 2010).

Technology at Work

When women started to enter the workforce, they transitioned into and subsequently dominated the service industry and helping-related jobs. With traditional hours and the availability of part-time or full-time employment, women felt the service industry offered them the balance of work and home life they desired (Waldman and McEddy 1974). Today, women are still clustered in the traditional female “service” occupations where they serve as nurses, teachers, social workers, and physical therapists (Hegewisch et al. 2010). Given the fact that these professions deal with people directly, women more than likely spend most of their workday engaging in face-to-face conversations and less of their time utilizing technological devices.

We suspect that these service or people-oriented positions come with less access to personal Internet use/political news on the job. A helpful starting point for understanding digital access by occupation is narrowing down which professions use the most technology in day-to-day tasks and
what is the extent of recreational use of the Internet/email while on the job. A recent Pew Research report (2014) examined which occupations rely the most on technology usage throughout the day. Online users were separated into office-based and non-office-based work, which included service work, and they found that Internet and email were more important to certain workforce sectors than others. People who worked in an office were three times as likely to choose usage of email (78% v. 25%) and two times more likely to choose Internet (68% v 25%) as being very important to their job (Pew Research 2014).

Importantly, even if women are able to achieve a high-status job with access to technology, women often feel pressure to show stronger work commitment in their labor; therefore, they tend to engage less in workplace leisure activities, such as non-work related computer use. In a study of social norms and employee attitudes, Moody and Siponen (2013) find that employees are more influenced by the benefits of recreational Internet use at work than by the penalties, and the more their peers engage in this behavior, the more likely individuals will follow suit. This same logic can be applied to how people think about and discuss politics and whether or not they engage in this behavior in the workplace. Connecting these behaviors to gender, race and status, Garrett and Danziger (2008) demonstrate that those in higher career positions do in fact use the Internet at work more often than those in lower status positions. Since men use the internet for more leisure activities (Garrett and Danziger 2008) and are often found to be in higher ranking positions, this would explain why males, on average, report engaging in more counterproductive computer use at work than females (Everton, Mastrangelo and Jolton 2005).

Women may use the Internet just as much as men but they may not be using it for the same things. Women use the Internet more for communication, and men more for searching (Jackson, Ervin, Gardner and Schmitt 2001). Women tend to use their leisure time going through social media networks and connecting on sites such as Facebook, Instagram, and Pinterest while men search sites
such as Twitter and Reddit. Due to the fact that men and women already use the internet differently from each other, it is difficult to know if given the opportunity to engage in “cyberslacking” at work, women will use it to seek out political content. Instead, women may more often use their time at work to either perform their job duties or communicate with others when they can spare a moment.

**Gender Gaps in Political Knowledge**

As women have advanced in education, higher status occupations and thereby higher levels of socioeconomic status, it remains puzzling why gender gaps in political knowledge continue to exist. Several scholars have creatively and thoughtfully explored this phenomenon, suggesting that differential uncertainty (Mondak and Anderson 2004) and knowledge types (Dolan 2011) are to blame. For the purposes of our study, we are most interested in theories of information access for this knowledge. Using the “best practices” from the literature on gender knowledge gaps in online experiments and naturally occurring information environments, Jerit and Barabas (2017) find that once exposed to political information, women gain ground, and the gap diminishes. We are suggesting that occupation can operate as an impediment to information flows, particularly when it comes to digital access.

[https://www.cambridge.org/core/services/aop-cambridge-core/content/view/8A8443944E4962742A00DE417B73EF78/S1743923X1700023Xa.pdf](https://www.cambridge.org/core/services/aop-cambridge-core/content/view/8A8443944E4962742A00DE417B73EF78/S1743923X1700023Xa.pdf)

**Data and Method**

In the 2014 wave of the General Social Survey, the instrument included the following question: “During a typical week, about what percentage of your total time at work would you normally spend using different types of electronic technologies (such as computers, tablets, smart phones, cash registers, scanners, GPS devices, robotic devices, and so on)?” (usetech). Respondents
were able to respond with a range of values from zero to one hundred percent. This question provides a unique insight into how the use of technology is permeating the workplace, though it does not distinguish between personal and work-related use. In total, the 2014 GSS had 2,538 respondents, however, only about half the sample had the opportunity to answer the question about the usage of technology (48.4%). Of those who provided a response, the mean percentage falls just about the midpoint, with the average subject indicating that they use technology 52.4% of the time. There are slight deviations based on gender, however. While the mean usetech score for men was 48.6%, women were slightly more inclined to use technology at 56.1% ($p < .05$).

**Figure 1**

Distribution of Tech Usage

Mean Score for Women = 56.1%, Men = 48.6%

For our purposes, we are interested in how this usetech score is distributed across different occupational classes. The U.S. Census Bureau has created an extremely detailed typology whereby
respondents describe the responsibilities of their job and are sorted into an industry code which consists of about three hundred options. The authors of the General Social Survey replicate this exact Census code classification. Because the sample size of the GSS is magnitudes of order smaller than the data collected by the Census Bureau, it is necessary to aggregate these industry codes into larger occupational classes, a technique that has been used by other research in the field of workplace behavior (Garrett and Danziger 2008). Using these 10 occupational classes, Garrett and Danziger (2008) created a dichotomous variable of high status occupations (management, business, financial, or professional) with all other job classes forming the reference category. The broader literature indicates those in higher status occupations have more access to data.

Figure 2

![Figure 2](https://www.census.gov/topics/employment/industry-occupation/about/occupation.html)

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2 https://www.census.gov/topics/employment/industry-occupation/about/occupation.html
Figure 2 visualizes the mean of usetech for each of the 10 occupational classes that are available in the General Social Survey, with all missing values removed. Notice that the two occupations in which people use the most technology (technology, engineering, and science along with management) also were classified as high technology use by previous scholarship. For the other two job classifications previously cited as heavy tech use -- health and technology and education, legal and media -- the GSS usetech mean is in the middle of the range. In addition, both office and administrative support, along with sales occupations, use technology approximately 2/3 of the time. This may be reflective of the rapid increase in the use of technology in certain occupations, since previous scholarship was based on data collected over a decade ago, and the use of the Internet has increased exponentially. The other major takeaway from these results is that there is not a clear means to create a dichotomous variable for high tech usage and low-tech usage occupational classes. Instead, a more statistically precise approach to understanding technology usage by occupation would be to use the mean scores for each occupational class as a continuous variable. This has the advantage of maintaining the real distance between job classes.

Figure 3
Is usetech unevenly distributed in occupational classes by gender? Figure 3 displays the differences between men and women in each of the 10 Census job classifications. Speaking generally, women use technology more than their male counterparts when working in the same occupational field. The notable exception to that is education, legal, and media fields. This is likely the case as more female respondents were placed in the teaching professions, which had a lower level of usetech while men made up a greater proportion of the legal field where technology is used much more frequently.

There are some fields where female technology usage far outstrips that of males in the same field. For instance, in office and administrative support, women use technology approximately 25% more than men. A similar gap exists between men and women in the military. However, across all 10 occupational classifications, the difference between the genders does not reach statistical significance in most cases. Of the three with statistically different means, men only use technology more in one occupational area (education, legal, and media) while women utilize technology more in management, and office and administrative support.

While the General Social Survey affords researchers this invaluable insight into the frequency of technology in the workplace, it does not provide the necessary questions for scholars to try and link this usetech variable with important political outcomes, most notably an increase in political knowledge. In addition, by transferring the usetech/occupational classifications to another dataset, we are avoiding generating hypotheses and testing them in the same data. Fortunately, the American National Election Study contains both the Census occupational codes and five political knowledge questions, which have been used in numerous other studies (CITE POLKNOW). To link these two surveys together, we generated a new variable in the ANES dataset that transferred the mean usetech GSS score for each of the 10 occupational groups into which ANES participants fell.
Before moving to more sophisticated analyses, it is valuable to understand how political knowledge is distributed across both genders without any controls. Figure 4 indicates the distribution of political knowledge for both men and women. Each group was asked five questions ranging from easy: “Who is the current vice president of the United States?” to difficult: “Who is the current chief justice of the United States Supreme Court?” Approximately 23% of the female respondents were unable to correctly answer a single question, compared to about 20% of men. At the top end of the range, 41% of men were able to answer at least 4 questions correct, while 32% of women were able to do the same. The mean number of correct answers for men was 2.33, and for
women was 1.94 (p < .05). It is clear from these results that women have lower levels of political knowledge, but is the use of technology a way to overcome that deficit in some scenarios?

Figure 5

The visualization in Figure 5 displays a simple linear relationship between the usage of technology on the x-axis and the number of knowledge questions answered correctly on the y-axis. Note that for both males and females, the relationship is positive and significant in that the more an individual uses technology at their job, the more likely they are to evince higher levels of political knowledge. Consider however, that the y-intercept for males in the sample is nearly 10% higher than for females, which is indicative of the knowledge results previously described. While the relationship
between these two variables is slightly more positive for males, the gain in knowledge between the two genders is relatively small (just .03 on a scale from 0-5).

Obviously this relationship can be mediated by a number of factors, with variables such as political interest playing a role in how much an individual desires to learn about politics. The ANES asks individuals, “How often do you pay attention to what’s going on in government and politics?” They were then given five response options ranging from “Never” to “Always” with “About half of the time” as the middle option. Individuals who responded to this question with the two lowest options were classified as “Low Interest,” while those who responded with one of the top three choices were put into the “High Interest” category. A marginal effects model was specified for both males and females that interacted the amount of technology they used at their jobs with how interested they were in day-to-day politics. The results of which are displayed in Figure 6.

**Figure 6**

![Interaction of Political Interest and Tech Usage on Political Knowledge](image-url)

When looking a just those with low interest in following politics, it is clear from the results that both groups gain political knowledge as they use technology more at work. On the left side of
the graph (which indicates low technology usage) the gender difference in political knowledge is not statistically significant. However as one begins to move to higher levels of technology usage, the difference between men and women of low political interest becomes statistically significant, with men gaining more political knowledge overall. For those of high interest, there is no statistical difference as one moves across the usage of technology scale. Notice that at all levels of usetech, men have higher levels of political knowledge than women, and the gap does not narrow, staying consistently at .25. The real story is, as previously mentioned, the y-intercept. Men consistently have a higher baseline of political knowledge than women possess, and the usage of technology does not narrow this gap.

There is much to consider from these results. It is clear there is obviously no negative relationship between using technology at work and political knowledge, however that relationship cannot always be described as a positive one. For both low interest men and women, they do not significantly increase their political knowledge no matter how much they are using technology in the workplace. For those who are highly politically interested, the “rich” are getting “richer”. For both men and women, there is a gain in knowledge, but this gain is larger for men (over half a point on a five point scale). It may be that men are using technology at work to feed their intellectual curiosity about politics, while women are less likely to use the internet to research politicians and current events. Unfortunately, these data do not allow us to explore this possibility. The ANES does, however, allow us to run a robust multivariate analysis that can control for a number of factors.

In order to further isolate the relationship between using technology and political knowledge, an OLS regression was specified with political knowledge as the dependent variable. The previously used items: usetech and political interest were included. In addition, a number of controls were added including: highest level of education completed, a dichotomous variable indicating whether a respondent has children under the age of 18 at home, and income. All variables were
scaled from zero to one to aid in interpretation. The sample was divided into a male-only sample and a female-only sample, and the results of the regression are displayed in a coefficient plot in Figure 7. The interpretation of the plot is straightforward: if one of the colored horizontal lines intersects with the vertical solid line on 0, then the variable is not statistically significant. However, if there is no intersection, and it’s to the right of the solid line on zero, that indicates greater political knowledge. If it’s to the left of the solid line, it means less political knowledge.

The first finding is the most striking: these variables do not work in different ways for men than they do for women. In no case does one of these factors generate more (or less) political knowledge for one gender than it does the other. Of all five independent variables included, only one (having children) drives down political knowledge, but the effect is small (.2 on a six-point scale for men, and .4 for women). This comports with previous work on the so-called “second shift” problem that has appeared in other research (Hochschild 1989; Blair-Loy et al. 2015). Three of the
other variables (political interest, education, and income) are all positively related to political knowledge. Unsurprisingly, political interest and education are the two factors that are the strongest drivers of political knowledge. Consider the fact that moving from the lowest level of education to the highest moves an individual up 2.5 questions on the political knowledge scale, all else being held equal. Income has a positive effect but it is much smaller at around .7 on a three-point scale.

The variable of interest for this study, the amount of technology used in the workplace, is not a significant predictor. While the coefficient is positive, the standard errors leave open the possibility that the effect could potentially be negative. It is worth pondering why this is the case. Obviously, there is a great deal of correlation between many of the variables. For instance, education and the usage of technology at work are correlated at .36, which provides support for the theory that greater levels of education lead individuals into white collar careers that typically involved significant usage of technology (a visualization of these correlations is available in the appendix). This becomes evident when the same regression analysis is specified without the education variable. In those results, technology usage becomes statistically significant and positive for men but does not for women (shown in the appendix).

Figure 8
One other possibility is worth exploring. The ANES asks respondents, “During a typical week, how many days do you watch, read, or listen to news on TV, radio, printed newspapers, or the Internet, not including sports?” Response options range from none to seven days a week. The sample was broken into those with low consumption (four days a week or less) and those with high consumption (five to seven days a week), and this was interacted with the usetech variable. Figure 8 is a margins plot of this interaction. Here the results are slightly different than the interaction between political interest and usetech. A male who indicates that they consume news four days a week or less has the same level of political knowledge as both females who consume a low level and a high level of news. However, as one moves from the lowest to the highest level of usetech, a gap begins to emerge between the three groups. At the highest level of technology usage, women who consume lots of news have higher political knowledge than men who do not consume as much news media. Again, the same general pattern emerges: men start at a higher baseline of political knowledge than women but both groups do benefit from the usage of technology.
Discussion

Though class, geography, and aptitudes influence occupation selection, men and women tend to choose different career paths. We were curious if women’s selection of jobs in the helping profession or with high person-to-person interaction would lead to less access to technology, indicating reduced time for consuming online content. We were limited by the availability of data that contains occupational codes, political knowledge/engagement, and technology usage on the job. Ideally, we would have a nationally representative sample across the 10 occupation groups who would answer a question like “how much time do you spend reading political content online while at work?” In addition, because there is a wealth of research on gender gaps in political knowledge batteries, we would be able to ask about content that women are more likely to know and if this knowledge correlates with tech usage at work.

In the end, we have some indications that generally tech use on the job does not seem to be related to political knowledge, other than serving as a proxy of sorts for education. This could help scholars interested in the education connection to think through the mechanisms by which individuals are gaining political sophistication. In addition, the interaction between total media consumption and tech use suggests that when women have an interest in following the news and have access at work, they can outperform men and women who are low media consumers with equal tech use. This may provide more insight into the “higher bar” thesis that suggests women tend to require high levels of knowledge before undertaking political activities (Ondercin and Jones-White 2011). This also adds to the story about career women gaining the social capital necessary for civic skill development and political engagement (Burns, Schlozman and Verba 2001). Our next steps include how we can think about the further intersections of race and class/education with occupation and personal access to political content in the workplace.
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Which Factors Lead to Greater Political Knowledge?

Data from CCES 2016