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POLITICAL IDENTIFICATION OF STEM WORKERS IN THE US

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ABSTRACT

The world is increasingly moving toward a technology- and information-based economy. With this change, a growing occupational category involves working in science, technology, engineering, and mathematics (STEM). What is the political identification of STEM workers? Quantitative work has shown that professionals, in general, are moving toward the Democratic Party (see, e.g. Hout, Brooks, and Manza 1995); but a qualitative interview-based study suggested that STEM workers, specifically, may be more conservative than others (Zussman 1985). The primary purpose of this study is to bring quantitative analyses to bear on this question to determine if STEM workers, are, indeed, more conservative than others. A secondary purpose is to begin explaining why they are more conservative, if such a pattern is found. The primary research hypothesis follows Zussman (1985) and predicts that STEM workers are significantly more conservative than other workers; a secondary hypothesis is that this significant difference will remain even when controlling for key demographic variables. Regression analyses provide support for both hypotheses, which suggests that STEM workers are, indeed, more conservative than others—a pattern that may be rooted in the structure of their work, a la Kohn (1989).
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Chapter 1

INTRODUCTION

Technological and social change are two co-occurring themes of the last two hundred years. The industrial revolution, along with the invention of the steam engine and the harnessing of mechanical power for work, led millions of people out of rural environments and into the cities (Macionis 2009). Likewise, a similar process is taking place today. Spurred by the invention of the microchip and the personal computer, information travels around the world in an instant and is transforming the spheres of work, economy, and politics (Macionis 2009).

The purpose of this study is to analyze the association between scientific and applied scientific (STEM) occupations and political identification. The relationship between class/occupation in the US and politics has interested sociologists for more than half a century. The earliest influential work in this area—an analysis of white collar politics by Mills (1951)—argued that those in white collar occupations were largely neutral in politics and depended greatly on the upper classes. Then came the famous “death of class thesis” first introduced by Nisbet (1959) and later forwarded by other scholars (e.g. Clark and Lipset 1991; Pakulski and Waters 1996), which argued, in part, that the relationship between class and politics in the US had diminished. But a critical point is how class is measured (Robinson and Kelley 1979).

When class is measured around occupational categories rather than socioeconomic status (SES), clear class differences in politics emerge. For instance, Hout, Brooks, and Manza (1995) find that the professional class (made up of those in professional
occupations) is increasingly moving toward the Democratic Party. Although STEM workers can be considered part of the professional class, Zussman (1985) finds in interviews of STEM workers that they are much more conservative than their counterparts.

Given the interesting contrast between the quantitative results of Hout et al (1995) concerning professionals, in general, and the qualitative findings of Zussman (1985) relating to STEM workers, specifically, it would be worthwhile to conduct quantitative analysis on a representative sample of the population to see if STEM workers are, indeed, more conservative than others. This study seeks to do just that.

Using data from the General Social Survey (GSS) on a representative sample of the population, this study seeks to answer the following research question: Are STEM workers in the US more conservative or more liberal? Drawing on the work of Zussman (1985), the study hypothesizes that STEM workers are significantly more conservative than others. Additionally, guided by Kohn’s (1989) theories on how work structure is related to values, the study predicts that this significant difference will remain even when controlling for demographics.
Chapter 2

A. THE EMERGENCE OF STEM WORK

The industrial revolution changed the spheres of work and economy. Workers moved from the rural to the urban centers. The predominant area of work became manufacturing instead of agriculture (Macionis 2009). Much like with the industrial revolution, the information revolution has also changed the structure of the economy and the characteristics of work. The predominant area of work in the developed world now has to do with manipulating numbers and information on a screen (Macionis 2009).

Which group of workers most epitomizes and best symbolizes these changes? People whose jobs and livelihoods bring them into direct and frequent contact with scientific knowledge, computer technology, and information networks are those individuals who are on the cutting edge of the information revolution—and are therefore most effected by, and intuitively aware of, these changes (i.e., STEM workers). Of course, there are many occupations that make use of computer technology; but the occupations that best fit the above description are STEM jobs. Examples of specific job titles in STEM fields include computer scientist, biotechnologist, software engineer, systems and network analysts and administrators, etc. (US Department of Labor 2015).

According to the US Department of Labor, many of the best paying and fastest growing occupations are in STEM (2015). STEM workers made up about five percent of the total American workforce in the early 2000s, and STEM occupations are growing at a rate several times faster than their closest competitors (Barley 2005). At the same time, some of the older and already established professions such as law, medicine (general
practice), and teaching have total sizes that are static or in decline (US Department of Labor 2015).

B. PAST RESEARCH ON STEM WORKERS

The study of skilled natural science workers (a pre-STEM category) and STEM workers can be characterized as having four phases over the last half century (Barley 2005). The first stage was characterized by neo-Weberian organizational sociology in the 1950s. The second stage shifted toward neo-Marxian class analysis in the 1970s. The third stage moved toward ethnographies in the 1980s. The fourth phase, which could be described as the “invisible” stage, covers roughly the time period from the 1990s to the 2000s, and is characterized by arguably too little empirical analysis (Barley 2005: 377). Each of the four stages is discussed in separate paragraphs below.

The first stage is so far removed from the purpose of the present study that it is only worth mentioning that it laid the foundation for all future work. This subfield emerged from sociology of culture, knowledge, and science in the 1950s (Star 1995). There was a struggle for legitimacy of the scientific study of science by sociologists between the social and natural sciences (Star 1995). This stems from the fact that science is supposed to be above and apart from pedestrian human concerns such as politics and economics. Science Technology and Society (STS) studies, and Actor-Network Theory (ANT) were especially important at this time (Star: 1995). The field was then known as industrial sociology, but has since been enveloped by economic, organizational, and work sociologies (Barley 2005).
The second stage coincided with the so-called “Marxist renaissance” in sociology. There are two seminal and pertinent examples of this type of research. The first is Harry Braverman’s *Labor and monopoly capital: the degradation of work in the twentieth century*, and the second was Michael Burawoy’s *Manufacturing consent: Changes in the labor process under monopoly capitalism* (1974; 1979). The former dealt with two sets of contradictions in modern society: (1) the deskilling of labor and the increasingly polarized labor market, and (2) soaring corporate profits (i.e., capital accumulation in the hands of the wealthy) coupled with growing levels of worker displacements (i.e., between and within occupations restructuring, also known as outsourcing, insourcing, offshoring, capital flight, downsizing, layoffs, occupational obsolescence, etc. (Macionis 2009). The latter dealt with the ways in which employers compel employees to engage in labor, and how employers prevent labor unrest. Burawoy’s work takes an inductive approach akin to Gramsci, arguing that class struggles take place every day in the arena of work and ideology rather than focusing on larger historical or structural forces.iii Neither work deals explicitly or frequently with skilled scientific workers, but both works implicitly and occasionally refer to occupations and the political awareness of these workers.

The third stage began to treat STEM workers as a separate if not distinct category when compared with other professionals and occupations. Zussman (1985) and Crawford (1991) both did ethnographies of electrical and chemical engineering plants and their workers in the United States and France, respectively.iv In a different, but similar, vein, Zeigler (1995) and Zander and Harding (1995) conducted quantitative cross-national studies on the STEM sectors. Both studies are relevant for the present research in that Zeigler (1995) begins to describe STEM workers as a social group with both
revolutionary and conformist potential—the paradox of occupational position and class location for STEM workers presents itself initially here. Zander and Harding (1995) bring values into the equation. They imply that there is a connection between workers’ values and workers’ occupations—a notion that fits well with Kohn’s (1989) ideas.

The most recent body (‘fourth stage’) of research around this topic could be referred to as the “invisible” stage, because STEM workers are a vitally important and germane topic in this decade, but this occupational group has not received the attention and thorough treatment it deserves in the discipline (Barley 2005: 377). Put directly, despite the emergence of STEM workers in recent years, arguably too little research has been done on this group. Still, though, some research has been done in this period that bears on the present study. In particular, studies by Marks (2009) and Svarc (2016) inform the present study.

Marks (2009) conducted observations and interviews at five Scottish software firms in order to better understand the class situation of software engineers. Marks finds evidence of a STEM paradox between class and occupation. There is what could be considered a role conflict between being at once a professional and an employee. It seems in this case that software engineers believe that they should be regarded as professionals because of the level of difficulty of their work and the extrinsic importance to society, but they have a sort of occupational inferiority complex because they are aware they work within an organizational hierarchy whose purpose is not to serve them or the public. Likewise, Svarc (2016) questions whether or not high-skill and low-skill service employees can really fit into the same class category, and if technical workers can really
be placed there too. These studies are important for the present research in that STEM workers may, in fact, cut across class categories: although many may be considered to fit within a skilled/professional class (well into the middle-class in gradational conceptualizations), some may be working-class. This has implications for value orientations given that the middle class values self-direction while the working class values conformity (Kohn 1989); it may also, by extension, have implications for political identification.

C. POLITICAL IDENTIFICATION

With the aforementioned shift in our economy and consequent growth in STEM jobs, it is worth exploring how the increase in STEM workers may impact our political system. In so doing, it is imperative to first identify the political leanings of STEM workers today.

Sociologists have long been interested in the relationship between class/occupation and politics. More than half a century ago, Mills (1951) wrote about white collar workers. His thesis was that middle class office workers were more politically and economically dependent on the upper class than had been farmers and small business owners previously. For Mills, this was a change brought about by the industrial revolution, and the closing of the American frontier. This was trouble for American democracy, because the power elites had interests of their own, which he addressed in a later, widely cited volume, *The Power Elite* (Mills 1956).
The relative political neutrality—and disengagement—of white collar workers identified by Mills (1951) served as a precursor to eventual claims that class was no longer related to politics. This was first introduced in an address by Nisbet (1959), and was later elaborated by other scholars (e.g. Clark and Lipset 1991; Pakulski and Waters 1996). The key problem with their arguments, however, is that they defined class around SES rather than occupation. As far back as 1979, scholars have shown that how class is defined has implications for class’s association with politics and other variables (Robinson and Kelley 1979). True to this point, conceptualizations of class built upon occupational categories show that class is significantly related to politics (Hout et al 1995).

Hout, Brooks, and Manza (1995) conduct quantitative analyses to examine how occupations and general class categories have an impact on party identification and voting in Presidential Elections. They show that professionals have shifted away from the Republican Party toward the Democratic Party in recent elections. Their analysis marks a significant improvement over the “class as SES” arguments of others (e.g. Clark and Lipset 1991; Pakulski and Waters 1996). Hout et al (1995) did not, however, divide occupational categories in such a way that would allow them to examine STEM workers, specifically, as a special kind of professional worker.

Zussman (1985) looks at STEM workers apart from other professional workers. Conducting qualitative analyses via interviews, he concludes that STEM workers are more conservative, politically, than their counterparts. This is an interesting possibility, but Zussman interviewed only a relatively small number of STEM workers who live
within a specific geographic region, which calls into question the generalizability of the results.

The primary purpose of this study is to conduct a quantitative test of Zussman’s (1985) assertions on a large, representative sample of the population to determine if STEM workers are, indeed, significantly more conservative than other workers. If they are, a secondary purpose of the study becomes explaining why. Is this conservative orientation rooted in the nature of the work that they do, or is simply a function of the fact that certain kinds of people enter these occupations (e.g. a ‘selection effect’)? These alternative underlying mechanisms are discussed in turn in the next section.

D. MECHANISMS UNDERLYING POLITICAL IDENTIFICATION

There are a number of mechanisms that may underlie political identification. In general, these mechanisms fall into one of two categories: structure and demographics. Structure in this context refers to the way in which a person’s life is structured—particularly one’s day-to-day work responsibilities. Demographics are straightforward and refer to standard traits such as race, gender, age, etc. In popular discourse, demographics sometimes fall under the umbrella of “identity politics.”

Structure: Class, Work, Values, and Politics

STEM workers may cut across class categories—particularly class conceptualizations built around SES. As Kohn (1989) pointed out nearly fifty years ago, social class
influences value orientations—and it is primarily through the structure of one’s work that this occurs. vi The idea that social structure impacts psychology is not new. vii Marx famously postulated that consciousness is determined by material conditions, and not the reverse as Hegel suggested (1846). Mills also ventured that social structure impacts psychology through the realm of work (1953). vii So there is theoretical precedent for the combination of micro and macro perspectives in sociology. What was missing previously was a mezzo connector—a social psychological process or mechanism through which structural forces were transmitted into psychological traits. Kohn (1989) offers as the missing mezzo connector his concept of learning generalization. viii

Learning generalization is a conduit by which important spheres of our lives interact with other spheres of our lives—for example, the spheres of work and family. Maslow (19660 adeptly summarized this logic by stating that if the only tool a person is accustomed to using is a hammer, he or she likely to treat every impediment as a nail. We spend most of our adult waking hours at work, and the reminder of our time is spent with family and friends. This is why Kohn (1989) theorized that workplace habits and values translate into particular ideas and parenting practices at home. ix He dubbed these value orientations self-direction and conformity. x The former, he showed, was associated with white collar (middle class) professions, and the latter with blue collar (working class) vocations.

What is the connection between these values and political ideology? The value of self-direction is more conducive to liberalism, and the value of conformity is more conducive to conservatism. Kohn (1989) couched this in terms of authoritarian-
conservatism, suggesting that the working class would lean more in this direction. Kelman and Barclay go with the simpler “authoritarianism” (as quoted in Kohn 1989).\textsuperscript{xii}

Other research has in more general terms suggested a connection between occupation, values, and political ideology. For instance, using the European Social Survey, Kitschell (2014) concludes that there is a correlation between occupation and political preferences.\textsuperscript{xi} Importantly, learning-generalization was one of the mechanisms Kitschell used to explain the results.

Kitschell (2014) wrote that the class structure and politics of post-industrial societies were changing. The middle class of skilled and semi-skilled labor was being replaced by college educated professionals. Qualitative work differences, rather than quantitative class rankings, were more important in explaining cross-class coalition formation for conservatives or liberals.

For STEM workers, specifically, one could imagine that there might be something about STEM work that lends itself to less self-direction and more conformity. Although Florida (2002) believes that STEM workers are part of a creative class, they may not be. What Florida fails to acknowledge is that globalization is driven by the expansion of markets by capital, and that professional autonomy, and employment in a hierarchical organization, are in conflict with each other. The day-to-day research agendas and services provided by STEM workers have more to do with meeting organizational goals handed down from upper management than to do with individual STEM workers’ imagination or inspiration. As such, STEM workers may be more akin to Kohn’s (1989)
working class—they would tend to adopt conformity as a value orientation, which, in turn, would lead to political conservatism.

Demographics and Politics

From a sociological perspective, demographic factors such as race, gender, age, and education/income should affect a person’s views and behaviors, including their political views. This is because of a number of factors, such as how a person is treated by others based on these demographic traits (e.g. the experience of racial discrimination) as well as how a person is socialized from childhood (e.g. boys and girls being raised differently and socialized into particular roles). In the paragraphs below, a number of demographic traits are concisely summarized, particularly in terms of how they align with political ideology in the U.S.

Gender

In terms of gender, women tend to be more liberal, men more conservative (Pew Research Center 2015). The difference between men’s and women’s party affiliation and political identification is mediated a bit by marital status, but the differences remain between women and men whether married or not (Pew Research Center 2015).

Race

One way of understanding the demographic differences in political identification is by looking at party affiliation. In the United States, those with a more liberal identification are usually affiliated with the Democratic Party, and those with a more conservative identification are usually affiliated with the Republican Party. In terms of
race/ethnicity, racial minorities tend to lean liberal; whites are generally more conservative (Pew Research Center 2015).

**Age**

The Silent Generation, ages 69-86, dominate with republicans. The Millennials, ages 18-33, dominate with the democrats. Party affiliation is consistently stratified across the age spectrum (Pew Research Center 2015). All things being equal (that is, race, gender, and education), the young are more liberal, and the aged are more conservative, as demographic groups.

**Income**

Party identification is also stratified by income. According to the same Pew Research Center report, Republicans dominate with voters who have family incomes $75,000 a year or more, and Democrats dominate with voters who have family incomes $30,000 a year or less (2015). The exact percentages were 48% republican leaning to 45% democratic learning for high income families, and 31% republican leaning to 54% democratic leaning for low income families (Pew Research Center 2015).

**Education**

Republicans dominate with those who never completed college, and democrats dominate with those with a graduate degree, but have less of a lead for those with two- or four-year degrees (Pew Research Center 2015). Type and length of education is a key variable in political affiliation, because those with higher learning tend to be more socially tolerant toward women, minorities, and the poor.
**STEM and Demographics**

STEM workers are demographically distinct from other workers. Gender-wise, technology and mathematics fields are dominated by men (Blickenstaff 2005). In terms of ethnicity, these fields are disproportionately filled by Caucasians. In terms of education and income, although there is some variation, the majority of STEM workers are well educated and receive higher-than-average incomes. As above, both men and Caucasians are known to have a proclivity for conservative (republican-leaning) positions on issues such as taxes and national defense, among other issues (Pew Research Center 2015). Additionally, those with higher incomes are generally more conservative. At the same time, though, more highly educated individuals tend to be more liberal.
Chapter 3

RESEARCH QUESTION AND HYPOTHESES

The primary research question of the study is *what is the political identification of STEM workers in the US today?* It is an important question to move us toward a better understanding of how this growing population of workers may impact the political system in our country. Political identification is chosen rather than some other ideological variable because political identification is more stable over that time than general ideologies (Goren 2005).

In addition to the primary research question above, a secondary research question gets at *why* STEM workers have a particular political identification that may be different from that of other workers: *Why do STEM workers exhibit a particular political identification?* Getting at this question will require running analyses on demographic variables to see if, say, gender or race explain the political identification of STEM workers.

In connection with the above questions, the study tests two directional theoretically-derived hypotheses. Based on the research of Hout et al (1995) and Kitschell (2014), the first hypothesis contends that STEM workers will differ from other workers in their political ideology. Based on the qualitative work of Zussman (1985), the predicted direction of this difference is that STEM workers will be more *conservative* than other workers.

*Hypothesis 1: STEM workers will be significantly more conservative than other types of workers.*
If Hypothesis 1 is supported, the next question is: Why? The mechanisms discussed in the Literature Review provide alternative possibilities: structure versus demographics. Although demographic arguments (e.g. around ‘identity politics’) have their merits, demographics alone likely would not fully explain the political identification of STEM workers. Instead, there is likely something about the structure of their work that would lead STEM workers to develop a particular political identification. Hypothesis 2 therefore argues that if STEM workers are more conservative, it is in part because of Kohn’s (1989) theorized mechanisms—namely that the kind of work they do leads to conformity (and, by extension, conservative ideology). That is, Hypothesis 2 posits that if STEM workers are more conservative, it is not merely a function of demographics. Instead, it follows Kohn’s theory that there is likely something about the structure of their work that leads them to be more conservative. As such:

*Hypothesis 2: The conservative tendencies of STEM workers will remain significant when controlling for demographics (put differently, it is not simply a function of demographics, or a ‘selection effect’).*
Chapter 4

DATA, METHODS, AND VARIABLES

To assess the evidence in support of the research hypotheses, analyses were run using a widely-used and cited secondary dataset: The General Social Survey (GSS). The sections below describe the data, methods, and variables used in these analyses. After that, results follow in a separate section.

Data

There were several possibilities in terms of research design. From the standpoint of generalizability, one effective method was to use an already existing data set with a representative sample of the population. Variables such as gender, age, education, and income were statistically “controlled.” The GSS was an ideal data set in that it is a representative sample of the population and it has all of the variables of interest. The GSS records data about specific occupations and contains a sample of approximately 150 STEM workers in the 2010 release, and there is a variable in the data set which relates to political identification. Likewise, demographic and socioeconomic information is included for each person surveyed. The GSS was therefore used in the regression analyses—the 2010 edition, specifically, because it was an interesting year, politically, in that there were midterm elections that year that led to major changes (e.g. Tea Party rise).

Methods

The approach taken in the analyses was to run ordinary least squares (OLS) regression models on variables identified below. Specifically, these models first tested whether or
not STEM workers are significantly different from other workers in terms of political identification. In subsequent models, then, “control variables” were added to ensure that the significant difference, if found, remained when controlling for key demographic and socioeconomic factors. Lastly, a fifth model breaks occupations into additional categories to assess the difference between STEM workers and these other occupations in their political identification.

Variables

Table 1 shows the sample sizes and the means of the variables used in the analysis. As one can see, the total sample size for each variable ranged from 1,202 to 2,044.

*Dependent Variable: Political Identification.* Political identification ranges from 0 to 6, extremely liberal to extremely conservative. The mean political identification of the GSS sample was a bit on the liberal side (2.465), much like the population as a whole.

*Independent Variable: Occupation.* STEM workers were identified and defined using the Census 1980 occupational codes (see Appendix A). STEM worker is identified among the many occupational categories available in the dataset. For most of the models, occupation is coded as 1 for STEM worker and 0 for worker in any other field. For the final model, however, other occupational categories, such as managers/executives, nonSTEM professionals, service and safety, sales and assistants, blue collar workers, and farmers are similarly dummy-coded and tested. Although means are provided in Table 1, it is worth noting that STEM workers make up around 8% of the sample, or 153 people.
The valid sample size (minus missing cases and the unemployed) for occupation was 1,889. The standard deviations were not included in Table 1 because they are all dummy coded. Managers and executives include all business professions, like human resources, logistics, and accounting. Non-STEM professionals include, for example, primary and secondary teachers, as well as attorneys and judges. Sales and assistants include low skill white collar workers. Service and safety most notably includes firefighters and police officers. Farming and blue collar are self-explanatory.

Control Variables: Demographics and Socioeconomic Status. Variables accounted for include demographic and socioeconomic variables such as gender, race, age, income, and education.

Gender was dummy coded as 1 for female and 0 for male (comparison group). Approximately 56% of respondents were women. Race, unfortunately, also had to be dummy coded because the GSS data are not disaggregated into ethnic subgroups such as Hispanic American, Asian American, etc. This is no doubt a major drawback of the GSS. Nonetheless, a white/nonwhite comparison is at least possible. This is exactly what the dummy coding did: 1 for nonwhite and 0 for white (comparison group). Approximately 24% of respondents were nonwhite. The mean age of persons in the sample was about 48, with standard deviation of about 18 years in either direction.

Education is defined as number of years of sequential education completed. Income is ranked in $5,000 increments from 1 to 26. Ages in the sample ranged from 18 to 89. The mean level of education of the sample was about 14 years, or two years of postsecondary education, with a standard deviation of about three years in either direction. The mean
income of persons in the sample was about 70,000 dollars a year, with a standard deviation of about 30,000 dollars in either direction.
Chapter 5

RESULTS

Table 2 shows the four main models that were used to test the research hypotheses. Model 1 includes only the independent variable, STEM worker. Model 2 includes the independent variable, STEM worker, and demographic control variables; Model 3 includes STEM worker and socioeconomic control variables; and Model 4 includes both the demographic and socioeconomic control variables (in addition to STEM worker).

As can be seen in Table 2, STEM workers are significantly more conservative than other workers across all four models at the .05 significance threshold (one-tailed), even controlling for other factors. The unstandardized coefficient for STEM worker in Models 1, 2, 3, and 4 were .531, .324, .478, and .378, respectively. As such, there is a decrease in the magnitude of the relationship between being a STEM worker and political identification once control variables were included in the model; but, as noted above, STEM worker remains significant across all models at the .05-level.

Table 3 shows the results from Model 5, which elaborates on the difference between STEM workers and other occupational categories by having STEM workers serve as the reference (excluded) group and examining how other categories of occupations compare, controlling for other factors. The results in Table 3 show that those working in service and safety occupations are significantly less conservative (i.e. more liberal) than STEM workers (.05 significance threshold) controlling for other factors. Likewise, the results show that non-STEM professionals are significantly less conservative (i.e. more liberal) than their STEM counterparts (marginally significant, $p = .057$). There are no other
statistically significant differences in political identification between STEM workers and other occupations.

To provide more detail on the relationships analyzed in Table 3, Table 4 and Figure 1, Table 5 depicts political identification means by occupation. For ease of viewing, they are presented in order from lowest (most liberal occupations) to highest (most conservative occupations). As can be seen—and as the analyses in Table 3 would imply—service/safety workers as well as non-STEM professionals are the most liberal, and are considerably lower in their mean political identification than STEM workers. On the other hand, STEM workers are quite similar to managers/executives and farmers in their high levels of conservatism. Indeed, only farmers are more conservative than STEM workers (albeit not significantly so, as shown in the analysis previously examined in Table 3).

In order to demonstrate how society might become more conservative, if the percentage of STEM workers increases (assuming STEM workers remain conservative in the future), data simulations were run. This also shows that the magnitude of conservatism among STEM workers is amplified as the sample size increases. Table 5 presents these findings.
Chapter 6

DISCUSSION/CONCLUSION

STEM workers are becoming an increasingly important part of the workforce today. As shifts in the economy lead to greater reliance on information technology, STEM careers are a growing occupational category. The growth in this sector will likely have implications for the US political system.

Previous research shows that professionals are moving toward the Democratic Party (Hout et al 1995), but that STEM workers, as a subset of professionals, may not be moving in a similar direction. Instead, interviews with STEM workers suggest that they may be more conservative than others (Zussman 1985).

Given the small, non-representative N of the Zussman (1985) study, quantitative analyses on a representative sample of the population were necessary to determine if the findings of his interviews are generalizable to STEM workers. The present project aimed to do just that.

To conduct an analysis of the political leanings of STEM workers, a data set was chosen (the GSS) and coded. Regressions were run to analyze the association of being a STEM worker with political identification (liberal versus conservative). Factors statistically controlled included gender, race, age, income, and education.

The results of the analyses were quite pronounced. There was a significant difference between STEM workers and other workers in political identification. STEM workers
were significantly more conservative than other workers. This significant difference remained even when including demographic and socioeconomic control variables.

These findings lend support to both Hypothesis 1 and Hypothesis 2. Hypothesis 1 predicted that STEM workers would be significantly more conservative than other workers. This was certainly true. Hypothesis 2 predicted that this relationship would remain significant even when controlling for demographic and other factors. This, too, held true—although the magnitude of the relationship decreased a bit.

The findings from Table 2 imply that STEM workers are, indeed, significantly more conservative than other workers, consistent with the general pattern emerging from Zussman’s (1985) interviews. Models 2-4 in Table 2 suggest that the significant relationship is not purely a function of demographics or socioeconomic status. Granted, the magnitude of the relationship decreased some, which suggests that demographics and socioeconomic status explain part of the relationship; but it did remain significant, which suggests that these control variables alone do not explain this relationship. In other words, there is likely something about STEM work that leads these workers to identify as more conservative than other workers, as Kohn (1989) would predict.

An interesting contradiction emerges when contrasting Hout et al’s (1995) findings with the findings of this paper (and the ideas of Zussman, 1985): professionals are becoming increasingly liberal (Hout et al 1995), but STEM workers, as a subcategory of professionals, are remaining conservative. It is worth expounding these distinctions. This was done in Table 3 via regression analysis and visualized in Table 4 and Figure 1 via presentation of descriptive analysis (means).
Not only are STEM workers significantly different in political identification from the universe of all other workers, as per the results in Table 2, they are significantly different from certain categories of workers, as expounded in Table 3. In particular, workers in service/safety occupations are significantly less conservative than STEM workers. Perhaps more importantly, non-STEM professionals are significantly less conservative than STEM workers (note: marginally so, $p = .057$). This helps address the seeming contradiction above and shows that STEM workers are a unique—and different, politically—subset of professional workers. This can be visualized when looking at the mean political identification of these different groups, as depicted in Table 4 and charted out in Figure 1.

*Why STEM Workers are More Conservative: Some Possibilities*

The explanation for why STEM workers are more conservative is admittedly a little unclear. Part of the explanation may be rooted in demographics and socioeconomic status, as the magnitude of their conservatism decreases when these control variables are included in models (see Models 2-4 in Table 2). But this is not a complete explanation, as the relationship between STEM workers and conservatism remains significant even with their inclusion in the models. This leaves the unique nature of STEM work itself as part of the explanation.

Although fully understanding the structure of STEM work falls outside the purview of the present study (indeed, an ethnography would be the only way to fully understand STEM work), there is likely something about STEM work that is genuinely different from other types of professional work. As argued earlier in response to Florida (2002),
the day-to-day research agendas and services provided by STEM workers may allow relatively little self-direction, particularly in corporate settings. This would lead STEM workers to share more in common with the working class than one might initially imagine. This is hinted at in Zussman’s (1985) work, wherein he refers to STEM workers as part of a “working middle class.” As such, they may tend to value conformity akin to the working class individuals studied by Kohn (1989), and, by extension, exhibit more conservative political identifications.

Another possible explanation for the conservative tendencies of STEM workers would be some unidentified factor. Based on the relatively small adjusted $R^2$ across models, it seems possible that there may be an untested factor that accounts for some of the conservatism among STEM workers. All of the factors deemed important in sociology were statistically controlled, such as gender, race, age, income, and education. Something else, however, may be at play that was not included. No study can capture the complete coalescence of social characteristics in one person’s life, and that was surely the case here as well. This leads into some of the limitations of the present study.

Limitations

Like any study, there were limitations in the present study. Many of the limitations are related to shortcomings in the GSS. Although the GSS was a suitable dataset for the analyses here given that it is a large, representative sample of the US and contains all the variables of interest, it still presented some challenges. One of those challenges—common to most survey data—was missing data. This issue intersected with—or worsened—other issues. For instance, another issue is that the number of cases in some
“boxes” (e.g. minority STEM workers) was relatively low to begin with, so losing cases was a concern. Fortunately, in the final analyses, there were enough cases to lend confidence to the results—even with the missing cases excluded. A final limitation already addressed earlier involves the very basic coding of race/ethnicity in the GSS. Ideally, more categories could have been included beyond a simple white/nonwhite dichotomy.

**Implications and Future Directions**

STEM workers are an increasingly important occupational group in our economy today. Sadly, research on STEM workers has entered into an “invisible stage,” failing to focus enough on this occupational category (Barley 2005: 377). This is exactly the opposite of what should be happening. Not only are STEM workers an increasingly important group in our economy, studies such as the present one suggest that they are unique—apart from other workers and even other professionals. In particular, this study has shown that STEM workers are statistically more conservative than other workers.

In the very least, the findings of the present study suggest that STEM workers warrant the attention of researchers. The “invisible stage” should end. STEM workers are important in our economy, and yet are distinct from other similar workers (e.g. other professionals). This study shows they are especially distinct in terms of politics, exhibiting far more conservatism than others—even other professionals. This revelation of how unique STEM workers are compared with their professional counterparts suggests that future studies ought to consider STEM workers as a separate category of professional worker—particularly studies related to politics.
The implication is that the United States may become more conservative, if the associations in the model hold true. That is, if the percentage of STEM workers continues to grow, and STEM workers continue to be more conservative, it could constitute a rightward shift in American politics. This has implications for policy makers, social scientists, and the public (see Table 5 for a simulation).

The GSS coding of the variable race was not ideal, because it only contained categories for white and non-white groups. Disaggregation of race into various ethnic subgroups would have allowed for a more precise and accurate measurement of political identification of these groups, as African, Asian, and Hispanic Americans represent the full range of the political spectrum. As research suggests, simple white/nonwhite codings are less than desirable (Padilla, Miller, and Broadus 2008).

Another variable which may influence the outcome of the models, and which should be included in future research, is employment status. That is, whether or not a STEM worker is self-employed, or employed by someone else, will have naturally have an impact on how one relates to the means of production. The sector a STEM worker is in may also have bearing.

Finally, what type of conservatism is being measured is also important. Social and economic conservatism are similar, but distinct strands of conservatism. In the future, these convergent brands should be disaggregated more fully. Furthermore, the possibility exists to combine multiple years of the GSS to create a larger sample of STEM workers, and workers in all occupations. It will be interesting to note what impact STEM worker conservatism will have on future elections, perhaps in 2020.
References


Florida, R., 2002. *The rise of the creative class, and how it is transforming work, leisure, community and everyday life*.


Table 1. Variables Used in Analyses.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political Identification</td>
<td>Range: 0 to 6 where 0 = extremely liberal and 6 = extremely conservative</td>
<td>1979</td>
<td>2.645</td>
<td>1.947</td>
</tr>
<tr>
<td><strong>Independent Variable: Occupation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEM Workers</td>
<td>Dummy coded where 1 = STEM Worker, 0 = worker in any other field.</td>
<td>1889</td>
<td>.081</td>
<td>----</td>
</tr>
<tr>
<td>NonSTEM Professionals</td>
<td>Dummy coded where 1 = Professionals NONSTEM, 0 = worker in any other field.</td>
<td>1889</td>
<td>.106</td>
<td>----</td>
</tr>
<tr>
<td>Managers and Execs</td>
<td>Dummy coded where 1 = Managers and Execs, 0 = worker in any other field.</td>
<td>1889</td>
<td>.141</td>
<td>----</td>
</tr>
<tr>
<td>Sales and Assistants</td>
<td>Dummy coded where 1 = Sales and Assistants, 0 = worker in any other field.</td>
<td>1889</td>
<td>.247</td>
<td>----</td>
</tr>
<tr>
<td>Service and Safety</td>
<td>Dummy coded where 1 = Service and Safety, 0 = worker in any other field.</td>
<td>1889</td>
<td>.199</td>
<td>----</td>
</tr>
<tr>
<td>Blue Collar</td>
<td>Dummy coded where 1 = Blue Collar, 0 = worker in any other field.</td>
<td>1889</td>
<td>.204</td>
<td>----</td>
</tr>
<tr>
<td>Farmers</td>
<td>Dummy coded where 1 = Farming Ag, 0 = worker in any other field.</td>
<td>1889</td>
<td>.021</td>
<td>----</td>
</tr>
<tr>
<td><strong>Demographic Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>Dummy coded where 1 = female, 0 = male</td>
<td>2044</td>
<td>.564</td>
<td>----</td>
</tr>
<tr>
<td>Race</td>
<td>Dummy coded where 1 = black, 0 = white</td>
<td>2044</td>
<td>.242</td>
<td>----</td>
</tr>
<tr>
<td>Age</td>
<td>Range: 18 to 89</td>
<td>2041</td>
<td>47.970</td>
<td>17.678</td>
</tr>
<tr>
<td><strong>Socioeconomic Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>Income categories in 5,000 increments. Range: 1 to 26.</td>
<td>1202</td>
<td>14.120</td>
<td>6.226</td>
</tr>
<tr>
<td>Education</td>
<td>Years of education.</td>
<td>2039</td>
<td>13.460</td>
<td>3.149</td>
</tr>
</tbody>
</table>
Table 2. Models 1-4, Unstandardized Coefficients from OLS Regression of Political Identification on Working in STEM Jobs (Reference Group: All other Occupations), Controlling for Demographic and Socioeconomic Factors (Standard Errors in Parentheses, Standardized Coefficients in Italics)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variable: Occupation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEM Worker</td>
<td>.531**</td>
<td>.324*</td>
<td>.478*</td>
<td>.347*</td>
</tr>
<tr>
<td></td>
<td>(.172)</td>
<td>(.165)</td>
<td>(.220)</td>
<td>(.210)</td>
</tr>
<tr>
<td></td>
<td>.071</td>
<td>.043</td>
<td>.065</td>
<td>.047</td>
</tr>
<tr>
<td><strong>Demographic Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-.499***</td>
<td>-.122</td>
<td>-.568***</td>
<td>-.140</td>
</tr>
<tr>
<td></td>
<td>(.090)</td>
<td>(.115)</td>
<td>(.134)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>-1.313***</td>
<td>-.270</td>
<td>-1.268***</td>
<td>-2.64</td>
</tr>
<tr>
<td></td>
<td>(.108)</td>
<td>(.134)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.002</td>
<td>.001</td>
<td>.007</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>(.003)</td>
<td>(.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Socioeconomic Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>-</td>
<td>.033**</td>
<td>.012</td>
<td>.035</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.010)</td>
<td>(.010)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.101</td>
<td>.035</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-</td>
<td>-.031</td>
<td>-.027</td>
<td>-.039</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.022)</td>
<td>(.021)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-.045</td>
<td>-.039</td>
<td></td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.005</td>
<td>.091</td>
<td>.012</td>
<td>.100</td>
</tr>
<tr>
<td>N</td>
<td>1876</td>
<td>1875</td>
<td>1198</td>
<td>1197</td>
</tr>
</tbody>
</table>

* $p < .05$  ** $p < .01$  *** $p < .001$ (one-tailed tests)
Table 3. Model 5, Unstandardized Coefficients from OLS Regression of Political Identification on Working in Non-STEM Jobs (Reference Group: STEM Workers), Controlling for Demographic and Socioeconomic Factors (Standard Errors in Parentheses, Standardized Coefficients in *Italics*)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variable: Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Service and Safety</td>
<td>-.495* (.248)</td>
</tr>
<tr>
<td></td>
<td>-.098</td>
</tr>
<tr>
<td>NonSTEM Professionals</td>
<td>-.408* (.258)</td>
</tr>
<tr>
<td></td>
<td>-.064</td>
</tr>
<tr>
<td>Sales and Assistants</td>
<td>-.335 (.234)</td>
</tr>
<tr>
<td></td>
<td>-.071</td>
</tr>
<tr>
<td>Blue Collar</td>
<td>-.344 (.257)</td>
</tr>
<tr>
<td></td>
<td>-.065</td>
</tr>
<tr>
<td>Managers and Execs</td>
<td>-.210 (.241)</td>
</tr>
<tr>
<td></td>
<td>-.037</td>
</tr>
<tr>
<td>Farmers</td>
<td>.190 (.473)</td>
</tr>
<tr>
<td></td>
<td>.013</td>
</tr>
<tr>
<td><strong>Demographic Control Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-.536*** (.125)</td>
</tr>
<tr>
<td></td>
<td>-.132</td>
</tr>
<tr>
<td>Race</td>
<td>-1.251*** (.135)</td>
</tr>
<tr>
<td></td>
<td>-.261</td>
</tr>
<tr>
<td>Age</td>
<td>.000 (.004)</td>
</tr>
<tr>
<td></td>
<td>.003</td>
</tr>
<tr>
<td><strong>Socioeconomic Control Variables</strong></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>.009 (.010)</td>
</tr>
<tr>
<td></td>
<td>.027</td>
</tr>
<tr>
<td>Education</td>
<td>-.025 (.024)</td>
</tr>
<tr>
<td></td>
<td>-.036</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.099</td>
</tr>
<tr>
<td>N</td>
<td>1197</td>
</tr>
</tbody>
</table>

* $p < .06$  ** $p < .01$  *** $p < .001$ (one-tailed tests)
Table 4. Mean Political Identification (Overall Mean: 2.645; Range: 0-6, with 0 = Extremely Liberal, 6 = Extremely Conservative) by Occupation, Ordered Lowest (Most Liberal) to Highest (Most Conservative)

<table>
<thead>
<tr>
<th>Occupational Categories</th>
<th>Mean Political Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service and Safety</td>
<td>2.427</td>
</tr>
<tr>
<td>NonSTEM Professionals</td>
<td>2.456</td>
</tr>
<tr>
<td>Sales and Assistants</td>
<td>2.562</td>
</tr>
<tr>
<td>Blue Collar</td>
<td>2.703</td>
</tr>
<tr>
<td>Managers and Execs</td>
<td>3.007</td>
</tr>
<tr>
<td><strong>STEM Worker</strong></td>
<td><strong>3.042</strong></td>
</tr>
<tr>
<td>Farmers</td>
<td>3.051</td>
</tr>
</tbody>
</table>
Figure 1. Mean Political Identification (Overall Mean: 2.645; Range: 0-6, with 0 = Extremely Liberal, 6 = Extremely Conservative) by Occupation, Ordered Lowest (Most Liberal) to Highest (Most Conservative), Presented in a Column Chart
Table 5. Simulation of Mean Societal Political Identification with Changes in the Percent of STEM Workers in the Workforce, Going from 10% of the Workforce by Twos to 20% (current percentage: 8%).

<table>
<thead>
<tr>
<th>Percent STEM Workers</th>
<th>Mean Political Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>2.822</td>
</tr>
<tr>
<td>12%</td>
<td>2.829</td>
</tr>
<tr>
<td>14%</td>
<td>2.836</td>
</tr>
<tr>
<td>16%</td>
<td>2.843</td>
</tr>
<tr>
<td>18%</td>
<td>2.850</td>
</tr>
<tr>
<td>20%</td>
<td>2.857</td>
</tr>
</tbody>
</table>
GSS Codebook

PRTYPREF: Categorical (Single)
Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent, or what?
Categories:
Republican
Democrat
Independent
Other (SPECIFY)
NO PREFERENCE
DON'T KNOW
REFUSED

PRTYSTRG: Categorical (Single)
Would you call yourself a strong {response to PRTYPREF} or not a very strong {response to PRTYPREF}?
Categories:
Strong
Not very strong
DON'T KNOW
REFUSED
1980 Census Occupation Codebook

NOT APPLICABLE
000N/A (not applicable)

MANAGERIAL AND PROFESSIONAL SPECIALTY OCCUPATIONS

Executive, Administrative, and Managerial Occupations
003Legislators
004Chief executives and general administrators, public administration
005Administrators and officials, public administration
006Administrators, protective service
007Financial managers
008Personnel and labor relations managers
009Purchasing managers
013Managers, marketing, advertising, and public relations
014Administrators, education and related fields
015Managers, medicine and health
016Managers, properties and real estate
017Postmasters and mail superintendents
018Funeral directors
019Managers and administrators, n.e.c.

Management Related Occupations:
023Accountants and auditors
024Underwriters
025Other financial officers
026Management analysts
027Personnel, training, and labor relations specialists
028Purchasing agents and buyers, farm products
029Buyers, wholesale and retail trade, except farm products
033Purchasing agents and buyers, n.e.c.
034Business and promotion agents
035Construction inspectors
036Inspection and compliance officers, except construction
037Management related occupations, n.e.c.

Professional Specialty Occupations:

Engineers, Architects, and Surveyors:
043Architects

Engineers:
044Aerospace
045Metallurgical and materials
046Mining
047Petroleum
048Chemical
049Nuclear
053Civil
054Agricultural
055Electrical and electronic
056Industrial
057Mechanical
058Marine and naval architects
059Engineers, n.e.c.
063Surveyors and mapping scientists

Mathematical and Computer Scientists:
064Computer systems analysts and scientists
065Operations and systems researchers and analysts
066Actuaries
067Statisticians
068Mathematical scientists, n.e.c.

Natural Scientists:
069Physicists and astronomers
073Chemists, except biochemists
074Atmospheric and space scientists
075Geologists and geodesists
076Physical scientists, n.e.c.
077Agricultural
and food scientists
Biological and life scientists
Forestry and conservation scientists
Medical scientists

Health Diagnosing Occupations:
Physicians
Dentists
Veterinarians
Optometrists
Podiatrists
Health diagnosing practitioners, n.e.c.

Health Assessment and Treating Occupations:
Registered nurses
Pharmacists
Dietitians

Therapists:
Inhalation therapists
Occupational therapists
Physical therapists
Speech therapists
Therapists, n.e.c.
Physicians' assistants

Teachers, Postsecondary:
Earth, environmental, and marine science teachers
Biological science teachers
Chemistry teachers
Physics teachers
Natural science teachers, n.e.c.
Psychology teachers
Economics teachers
History teachers
Political science teachers
Sociology teachers
Social science teachers, n.e.c.
Engineering teachers
Mathematical science teachers
Computer science teachers
Medical science teachers
Health specialties teachers
Business, commerce, and marketing teachers
Agriculture and forestry teachers
Art, drama, and music teachers
Physical education teachers
Education teachers
English teachers
Foreign language teachers
Law teachers
Social work teachers
Theology teachers
Trade and industrial teachers
Home economics teachers
Teachers, postsecondary, n.e.c.

Teachers, Except Postsecondary:
Prekindergarten and kindergarten teachers
Elementary school teachers
Secondary school teachers
Special education teachers
Counselors, educational and vocational

Librarians, Archivists, and Curators:
Librarians
Archivists and curators

Social Scientists and Urban Planners:
Economists
Psychologists
Sociologists
Social scientists, n.e.c.
Urban planners
Social, Recreation, and Religious Workers:
174Social workers175Recreation workers176Clergy177Religious workers, n.e.c.

Lawyers and Judges:
178Lawyers179Judges

Writers, Artists, Entertainers, and Athletes:
183Authors184Technical writers185Designers186Musicians and composers187Actors and directors188Painters, sculptors, craft-artists, and artist printmakers189Photographers193Dancers194Artists, performers, and related workers, n.e.c.195Editors and reporters197Public relations specialists198Announcers199Athletes

TECHNICAL, SALES, AND ADMINISTRATIVE SUPPORT OCCUPATIONS

Technicians and Related Support Occupations

Health Technologists and Technicians:
203Clinical laboratory technologists and technicians204Dental hygienists205Health record technologists and technicians206Radiologic technicians207Licensed practical nurses208Health technologists and technicians, n.e.c.

Technologists and Technicians, Except Health:

Engineering and Related Technologists and Technicians:
213Electrical and electronic technicians214Industrial engineering technicians215Mechanical engineering technicians216Engineering technicians, n.e.c.217Drafting occupations218Surveying and mapping technicians

Science Technicians:
223Biological technicians224Chemical technicians225Science technicians, n.e.c.

Technicians, Except Health, Engineering and Science:
226Airplane pilots and navigators227Air traffic controllers228Broadcast equipment operators229Computer programmers233Tool programmers, numerical control234Legal assistants235Technicians, n.e.c.

Sales Occupations
243 Supervisors and proprietors, sales occupations

Sales Representatives, Finance and Business Services:
253 Insurance sales occupations
254 Real estate sales occupations
255 Securities and financial services sales occupations
256 Advertising and related sales occupations
257 Sales occupations, other business services

Sales Representatives, Commodities, Except Retail:
258 Sales engineers
259 Sales representatives, mining, manufacturing, and wholesale

Sales Workers, Retail and Personal Services:
263 Sales workers, motor vehicles and boats
264 Sales workers, apparel
265 Sales workers, shoes
266 Sales workers, furniture and home furnishings
267 Sales workers, radio, TV, hi-fi, and appliances
268 Sales workers, hardware and building supplies
269 Sales workers, parts
274 Sales workers, other commodities
275 Sales counter clerks
276 Cashiers
277 Street and door-to-door sales workers
278 News vendors

Sales-Related Occupations:
283 Demonstrators, promoters and models
284 Auctioneers
285 Sales support occupations, n.e.c.

Administrative Support Occupations, Including Clerical:

Supervisors, Administrative Support Occupations:
303 Supervisors, general office
304 Supervisors, computer equipment operators
305 Supervisors, financial records processing
306 Chief communications operators
307 Supervisors, distribution, scheduling, and adjusting clerks

Computer Equipment Operators:
308 Computer operators
309 Peripheral equipment operators

Secretaries, Stenographers and Typists:
313 Secretaries
314 Stenographers
315 Typists

Information Clerks:
316 Interviewers
317 Hotel clerks
318 Transportation ticket and reservation agents
319 Receptionists
323 Information clerks, n.e.c.
Records Processing Occupations, Except Financial:
325Classified-ad clerks326Correspondence clerks327Order clerks328Personnel clerks, except payroll and timekeeping329Library clerks335File clerks336Records clerks

Financial Records Processing Occupations:
337Bookkeeping, accounting, and auditing clerks338Payroll and timekeeping clerks339Billing clerks343Cost and rate clerks344Billing, posting, and calculating machine operators

Duplicating, Mail, and Other Office Machine Operators:
345Duplicating machine operators346Mail preparing and paper handling machine operators347Office machine operators, n.e.c.

Communications Equipment Operators:
348Telephone operators349Telegraphers353Communications equipment operators, n.e.c.

Mail and Message Distributing Occupations:
354Postal clerks, except mail carriers355Mail carriers, postal service356Mail clerks, except postal service357Messengers

Material Recording, Scheduling, and Distributing Clerks:
359Dispatchers363Production coordinators364Traffic, shipping, and receiving clerks365Stock and inventory clerks366Meter readers368Weighers, measurers, and checkers369Samplers373Expediters374Material recording, scheduling, and distributing clerks, n.e.c.

Adjusters and Investigators:
375Insurance adjusters, examiners, and investigators376Investigators and adjusters, except insurance377Eligibility clerks, social welfare378Bill and account collectors

Miscellaneous Administrative Support Occupations:
379General office clerks383Bank tellers384Proofreaders385Data-entry keyers386Statistical clerks387Teachers’ aides389Administrative support occupations, n.e.c.

SERVICE OCCUPATIONS
Private Households Occupations
403 Launderers and Ironers
404 Cooks, private household
405 Housekeepers and butlers
406 Child care workers, private household
407 Private household cleaners and servants

Protective Service Occupations

Supervisors, Protective Service Occupations:
413 Supervisors, firefighting and fire prevention occupations
414 Supervisors, police and detectives
415 Supervisors, guards

Firefighting and Fire Prevention Occupations:
416 Fire inspection and fire prevention occupations
417 Firefighting occupations

Police and Detectives:
418 Police and detectives, public service
423 Sheriffs, bailiffs, and other law enforcement officers
424 Correctional institution officers

Guards:
425 Crossing guards
426 Guards and police, except public service
427 Protective service occupations, n.e.c.

Service Occupations, Except Protective and Household:

Food Preparation and Service Occupations:
433 Supervisors, food preparation and service occupations
434 Bartenders
435 Waiters and waitresses
436 Cooks, except short order
437 Short-order cooks
438 Food counter, fountain, and related occupations
439 Kitchen workers, food preparation
443 Waiters'/waitresses' assistants
444 Miscellaneous food preparation occupations

Health Service Occupations:
445 Dental assistants
446 Health aides, except nursing
447 Nursing aides, orderlies, and attendants

Cleaning and Building Service Occupations, except Household:
448 Supervisors, cleaning and building service workers
449 Maids and housemen
453 Janitors and cleaners
454 Elevator operators
455 Pest control occupations
Personal Service Occupations:
456Supervisors, personal service occupations457Barbers458Hairdressers and cosmetologists459Attendants, amusement and recreation facilities463Guides464Ushers465Public transportation attendants466Baggage porters and bellhops467Welfare service aides468Child care workers, except private household469Personal service occupations, n.e.c.

FARMING, FORESTRY, AND FISHING OCCUPATIONS

Farm Operators and Managers:
473Farmers, except horticultural474Horticultural specialty farmers475Managers, farms, except horticultural476Managers, horticultural specialty farms

Other Agricultural and Related Occupations:

Farm Occupations, Except Managerial:
477Supervisors, farm workers479Farm workers483Marine life cultivation workers484Nursery workers

Related Agricultural Occupations:
485Supervisors, related agricultural occupations486Groundskeepers and gardeners, except farm487Animal caretakers, except farm488Graders and sorters, agricultural products489Inspectors, agricultural products

Forestry and Logging Occupations:
494Supervisors, forestry and logging workers495Forestry workers, except logging496Timber cutting and logging occupations

Fishers, Hunters, and Trappers:
497Captains and other officers, fishing vessels498Fishers499Hunters and trappers

PRECISION PRODUCTION, CRAFT, AND REPAIR OCCUPATIONS

Mechanics and Repairers
503Supervisors, mechanics and repairers

Mechanics and Repairers, Except Supervisors:
Vehicle and Mobile Equipment Mechanics and Repairers:
505 Automobile mechanics, except apprentices
506 Automobile mechanic apprentices
507 Bus, truck, and stationary engine mechanics
508 Aircraft engine mechanics
509 Small engine repairers
514 Automobile body and related repairers
515 Aircraft mechanics, except engine
516 Heavy equipment mechanics
517 Farm equipment mechanics
518 Industrial machinery repairers
519 Machinery maintenance occupations

Electrical and Electronic Equipment Repairers:
523 Electronic repairers, communications and industrial equipment
525 Data processing equipment repairers
526 Household appliance and power tool repairers
527 Telephone line installers and repairers
529 Telephone installers and repairers
533 Miscellaneous electrical and electronic equipment repairers
534 Heating, air conditioning, and refrigeration mechanics

Miscellaneous Mechanics and Repairers:
535 Camera, watch, and musical instrument repairers
536 Locksmiths and safe repairers
538 Office machine repairers
539 Mechanical controls and valve repairers
543 Elevator installers and repairers
544 Millwrights
547 Mechanics and repairers, n.e.c.
549 Mechanics and repairers, n.s.

Construction Trades

Supervisors, Construction Occupations:
553 Supervisors, brickmasons, stonemasons, and tile setters
554 Supervisors, carpenters and related workers
555 Supervisors, electricians and power transmission installers
556 Supervisors, painters, paperhangers, and plasterers
557 Supervisors, plumbers, pipefitters, and steamfitters
558 Supervisors, n.e.c.

Construction Trades, Except Supervisors:
563 Brickmasons and stonemasons, except apprentices
564 Brickmason and stonemason apprentices
565 Tile setters, hard and soft
566 Carpet installers
567 Carpenters, except apprentices
569 Carpenter apprentices
573 Drywall installers
575 Electricians, except apprentices
576 Electrician apprentices
577 Electrical power installers and repairers
579 Painters, construction and maintenance
583 Paperhangers
584 Plasterers
585 Plumbers, pipefitters, and steamfitters, except apprentices
587 Plumber, pipefitter, and steamfitter apprentices
588 Concrete and terrazzo finishers
589 Glaziers
593 Insulation workers
594 Paving, surfacing, and tamping equipment operators
595 Roofers
596 Sheetmetal duct installers
597 Structural metal workers
598 Drillers, earth
599 Construction trades, n.e.c.
Extractive Occupations
613 Supervisors, extractive occupations
614 Drillers, oil well
615 Explosives workers
616 Mining machine operators
617 Mining occupations, n.e.c.

Precision Production Occupations
633 Supervisors production occupations

Precision Metal Working Occupations:
634 Tool and die makers, except apprentices
635 Tool and die maker apprentices
636 Precision assemblers, metal
637 Machinists, except apprentices
639 Machinist apprentices
643 Boilermakers
644 Precision grinders, fitters, and tool sharpeners
645 Patternmakers and model makers, metal
646 Lay-out workers
647 Precious stones and metals workers
649 Engravers, metal
653 Sheet metal workers, except apprentices
654 Sheet metal worker apprentices
655 Miscellaneous precision metal workers

Precision Woodworking Occupations:
656 Patternmakers and model makers, wood
657 Cabinet makers and bench carpenters
658 Furniture and wood finishers
659 Miscellaneous precision woodworkers

Precision Textile, Apparel, and Furnishings Machine Workers:
666 Dressmakers
667 Tailors
668 Upholsterers
669 Shoe repairers
673 Apparel and fabric patternmakers
674 Misc. precision apparel and fabric workers

Precision Workers, Assorted Materials:
675 Hand molders and shapers, except jewelers
676 Patternmakers, lay-out workers, and cutters
677 Optical goods workers
678 Dental laboratory and medical appliance technicians
679 Bookbinders
683 Electrical and electronic equipment assemblers
684 Miscellaneous precision workers, n.e.c.

Precision Food Production Occupations:
686 Butchers and meat cutters
687 Bakers
688 Food batchmakers

Precision Inspectors, Testers, and Related Workers:
689 Inspectors, testers, and graders
693 Adjusters and calibrators
Plant and System Operators:
694 Water and sewage treatment plant operators
695 Power plant operators
696 Stationary engineers
699 Miscellaneous plant and system operators

OPERATORS, FABRICATORS, AND LABORERS

Machine Operators, Assemblers and Inspectors

Machine Operators and Tenders, except Precision:

Metalworking and Plastic Working Machine Operators:
703 Lathe and turning machine set-up operators
704 Lathe and turning machine operators
705 Milling and planing machine operators
706 Punching and stamping press machine operators
707 Rolling machine operators
708 Drilling and boring machine operators
709 Grinding, abrading, buffing, and polishing machine operators
713 Forging machine operators
714 Numerical control machine operators
715 Miscellaneous metal, plastic, stone, and glass working machine operators
717 Fabricating machine operators, n.e.c.

Metal and Plastic Processing Machine Operators:
719 Molding and casting machine operators
723 Metal plating machine operators
724 Heat treating equipment operators
725 Miscellaneous metal and plastic processing machine operators

Woodworking Machine Operators:
726 Wood lathe, routing, and planing machine operators
727 Sawing machine operators
728 Shaping and joining machine operators
729 Nailing and tacking machine operators
733 Miscellaneous woodworking machine operators

Printing Machine Operators:
734 Printing machine operators
735 Photoengravers and lithographers
736 Typesetters and compositors
737 Miscellaneous printing machine operators

Textile, Apparel, and Furnishings Machine Operators:
738 Winding and twisting machine operators
739 Knitting, looping, taping, and weaving machine operators
743 Textile cutting machine operators
744 Textile sewing machine operators
745 Shoe machine operators
747 Pressing machine operators
748 Laundering and dry cleaning machine operators
749 Miscellaneous textile machine operators

Machine Operators, Assorted Materials:
48

753 Cementing and gluing machine operators
754 Packaging and filling machine operators
755 Extruding and forming machine operators
756 Mixing and blending machine operators
757 Separating, filtering, and clarifying machine operators
758 Compressing and compacting machine operators
759 Painting and paint spraying machine operators
763 Roasting and baking machine operators, food
764 Washing, cleaning, and pickling machine operators
765 Folding machine operators
766 Furnace, kiln, and oven operators, except food
768 Crushing and grinding machine operators
769 Slicing and cutting machine operators
773 Motion picture projectionists
774 Photographic process machine operators

Miscellaneous and Not Specified Machine Operators:
777 Miscellaneous machine operators
779 Machine operators, n.s.

Fabricators, Assemblers, and Hand Working Occupations:
783 Welders and cutters
784 Solderers and blazers
785 Assemblers
786 Hand cutting and trimming occupations
787 Hand molding, casting, and forming occupations
789 Hand painting, coating, and decorating occupations
793 Hand engraving and printing occupations
794 Hand grinding and polishing occupations
795 Miscellaneous hand working occupations

Production Inspectors, Testers, Samplers, and Weighers:
796 Production inspectors, checkers, and examiners
797 Production testers
798 Production samplers and weighers
799 Graders and sorters, except agricultural

Transportation and Material Moving Occupations

Motor Vehicle Operators:
803 Supervisors, motor vehicle operators
804 Truck drivers, heavy
805 Truck drivers, light
806 Driver-sales workers
808 Bus drivers
809 Taxi cab drivers and chauffeurs
813 Parking lot attendants
814 Motor transportation occupations, n.e.c.

Transportation Occupations, Except Motor Vehicles:

Rail Transportation Occupations:
823 Railroad conductors and yardmasters
824 Locomotive operating occupations
825 Railroad brake, signal, and switch operators
826 Rail vehicle operators, n.e.c.

Water Transportation Occupations:
Ship captains and mates, except fishing boats
Sailors and deckhands
Marine engineers
Bridge, lock, and lighthouse tenders

Material Moving Equipment Operators:
Supervisors, material moving equipment operators
Operating engineers
Longshore equipment operators
Hoist and winch operators
Crane and tower operators
Excavating and loading machine operators
Grader, dozer, and scraper operators
Industrial truck and tractor equipment operators
Misc. material moving equipment operators

Handlers, Equipment Cleaners, Helpers, and Laborers
Supervisors, handlers, equipment cleaners, and laborers, n.e.c.
Helpers, mechanics and repairers

Helpers, Construction and Extractive Occupations:
Helpers, construction trades
Helpers, surveyor
Helpers, extractive occupations
Construction laborers
Production helpers

Freight, Stock, and Material Handlers:
Garbage collectors
Stevedores
Stock handlers and baggers
Machine feeders and offbearers
Freight, stock, and material handlers, n.e.c.
Garage and service station related occupations
Vehicle washers and equipment cleaners
Hand packers and packagers
Laborers, except construction

WORKERS NOT CLASSIFIED BY OCCUPATION
Unemployed, last worked in Armed Forces (within past 5 years)
Unemployed, no work within past 5 years
Barley (2005) refers loosely to these types of professions as ‘epochal occupations (in the Marxist sense),’ because they define and represent work for a specific time period.

For example, cashiers and bank tellers both use computers in their daily work, but neither one has theoretical knowledge about hardware or software design.

The term “manufacture of consent” was actually coined by early 20th century Italian Marxist Antonio Gramsci.

These two authors planned and executed their studies under the same faculty advisor at Columbia University.


This was in White Collar. However, he articulated similar reasoning about social structure and psychology in The Sociological Imagination, and The Power Elite.

According to Kohn, this concept is similar to intellectual flexibility, and different from reaction formation (1989).

The parenting practices were in conjunction with the role allocation of mothers and fathers in terms of parental support and constraint acted out or embodied towards children.

This variable was measured by Kohn using an index of three attributes: supervision of work, complexity of work, and variety of work. The middle attribute was coded and further subdivided as work with people, things, or ideas.

Kohn mentions Piaget on moral realism and a “fixed or absolute view of the social world (1989).”

This is different from my research study because it was conducted in Europe and did not concentrate on STEM workers as a group.

A challenge encountered early in analysis is that there are very few nonwhite STEM workers in the GSS. Additionally, some were lost as variables such as income were added (which has missing data for a number of cases). The solution, though not perfect, was to allow a changing N across models rather than drop all missing cases at the onset. This does mean, however, that fewer nonwhite STEM workers appear in later models (e.g. models 3-5).