

THE UNIVERSITY OF CHICAGO

The Fair-Wage Revisited

By

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Abstract

I hypothesize that the wage rate that workers believe they deserve is determined by their attitudes toward conditions in their workplace and their overall perceptions of their economic standing.¹ Using data from the General Social Survey (n = 7416) and the Federal Employee Viewpoint Survey (n = 624800), this study uses traditional binomial probit regression, as well as recursive feature elimination techniques, in order to understand the relationships that impact feelings of deservedness and the conception of fair wages. The results of these tests confirm some conclusions of past researchers, but also add to them. The largest contributing factors to feeling deservedness over one's wages in the United States during the years assessed are feelings of fairness and value in the workplace, along with an understanding of one's financial status that configures themselves in relation to those in their reference set.

I. Introduction

There exists individuals who behave in the most rational manner that they can within a bounded set of information (Simon 1972). This information, when relating to wages, is composed primarily of the individual's understanding of the financial conditions of those with whom they have tangential relations, such as co-workers (Small 2017). According to rational expectations and related theories, they act on this information in order to maximize their own interests (Becker 2013). These interests are socially constructed within their social groups and situations, thus impacting their economic actions and desires (Granovetter 1985). The composition of their desires manifests as an algorithmic understanding of what an individual believes they deserve, with recognizable inputs and outputs (Akerlof 1982). The product of all of these lines of thought is an interpretation of fair-wage formation that consists of an individual's understanding of the world around them, rather than the actuality of the world around them. Many would expect individuals to be more satisfied, or more inclined to feel that they were getting what they deserved, as their economic conditions improved, but the results would need to show otherwise, that it is not their actual income that matters, but their perception of their own financial status and their workplace situation. In setting forth with methods, then, it will be important to rule out factors that suggest objectivity (income, income of coworkers, etc) and test the validity of subjective values (Opinion of financial situation, workplace culture, etc). This creates a scenario where deservedness is a construction of the individual's perception of their own financial situation in relation to the world, their community, their workplace, et cetera in conjunction with their treatment and feeling of value at work. Deservedness, as opposed to only fairness or satisfaction, was studied because of its unique predictive power over employee output and return (Yellen, Akerlof 1990; Gächter, Thöni 2010). Further study of this topic, adding to extensive existing research, would be useful to labor organizers hoping to lobby for benefits as well as employers hoping to increase productivity. It would also be useful for policy-makers hoping for either outcome.

II. Theoretical Framework

a. Rational Choice Social Theory

Rational choice theory has grown and developed to reflect changing sentiments and understandings of the concept, but many facets of the theory have remained relatively similar to the original principles. For these principles it is helpful to consult Gary Becker's work *The Economic Approach to Human Behavior*. Becker clarifies some of the key propositions of the "Economic Approach," or what we call rational choice theory;

1. The approach aims to observe phenomena through a lens of maximization of wealth or utility for the individual or group in discussion
2. Difference in preference for social inputs (wealth, health, prestige, happiness, pleasure) between individuals, and over time, do not exist in large quantity or magnitude
3. Prices and markets coordinate the actions of actors in the system by constraining desires and limiting options to force choice (Becker 2013)

This paper works with many of the assumptions that Becker proposes, accepting that individuals operate from an intent to maximize utility and that the process of which manifests in markets and price. This paper does not operate under the assumption that wealth and monetary gain are the sole motivators of economic action. Rather, these operative variables in a utility maximizing function are given their individually weighted values through social processes, and to think of them outside of a sociological context would be a mistake (Schelling 1979).

The process by which the macro forces influence the individual's behavior and vice versa is best understood through James Coleman's 1986 macro-micro-macro model interpreted by Hedstrom and Swedberg. Otherwise known as the "boat-model" because of its shape, Coleman's theory outlines three

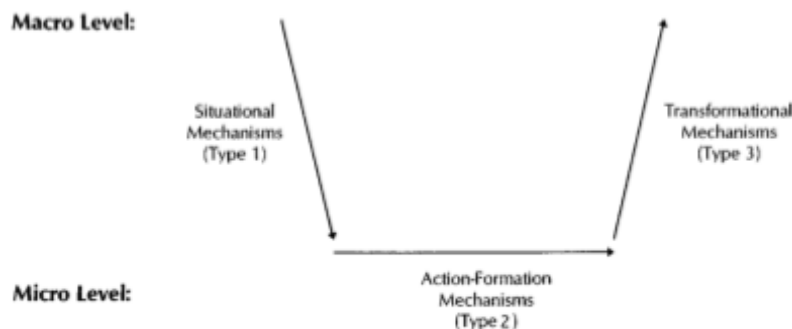
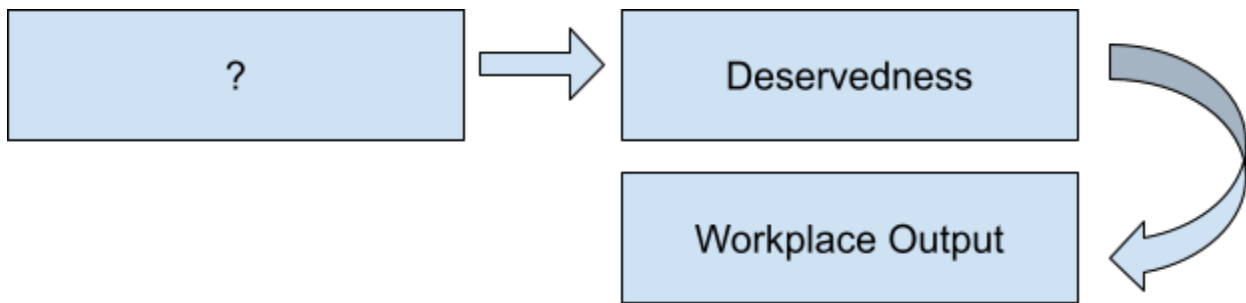


Figure 1.1. A typology of social mechanisms.
Credit: Hedstrom and Swedberg 1996, Page 22

steps for understanding macro level forces in society, such as labor markets. The first step is to understand how other macro level forces impact an individual. The second step is to understand how the individual internalizes, then responds to the macro level event. The final step is to understand how individuals responding to the event together thus create a new macro level effect (Hedstrom and Swedberg 1996). The second and third steps of this process appear to be well understood. We know

how individuals respond to receiving or not receiving what they believe they deserve from Akerlof and Yellen’s 1990 work, later confirmed computationally by Gächter and Thöni 2010. If they receive what they deserve, or above, their work output increases, and vice versa if they receive lower than what they believe they deserve, their work output decreases (Yellen, Akerlof 1990; Gächter, Thöni 2010). It is also clear that employee output increases the firm’s output, shifts workplace culture, national GDP and tax revenue, and national work and political culture (Sprague 2021; Sheiner 2019). Future research could be done to computationally analyze the exact effects in this regard. This study will address the first step of the process, understanding how individuals internalize the outside world to conceive of what they believe they deserve.



b. The Fair Wage

My starting point is George Akerlof’s conception of the fair-wage as determined by an individual. Deriving from a perspective-based understanding of fairness, Akerlof proposes that a fair wage is a function of the individual’s actual wage, the wages of others in their reference set, the unemployment benefits of individuals in the reference set, the number of unemployed in the reference set, the individual’s work rules in current and previous periods and the work rules of those in the reference set (Akerlof 1982, p. 556). The last part, work rules, will be key as it employs the social rather than the economic motives of an individual. This allows the understanding of wages to be much more than money, but also the social and physical conditions under the employer’s direction or control. We are also going to expand upon these variables to understand the fair wage to not only include the wages of those in their reference set, but also wages that society might suggest they deserve; things that are outside the direct control of the employer. This new variable, *s*, is the variable that is derived from the embedded, social conception of a fair wage, rather than just what is in the individual’s reference set. This can include influences from political movements and other instances that put the individual’s wage in perspective. Akerlof’s theory is a useful starting place for understanding the development of an individual’s concept of deservedness, but it must be updated based on development’s in the field, and quantitative methods.

c. Embeddedness

Granovetter, reforming the field of economic sociology, presents the concept of embeddedness. Embeddedness is the idea “that the behavior and institutions to be analyzed are so constrained by ongoing social relations that to construe them as independent is a grievous misunderstanding.”

Granovetter urges sociological thinkers not to confine themselves to over- or undersocialized conceptions of human action (Granovetter 1985). For the purposes of this paper, we will use this to understand that the later part of Akerlof's equation, the "work rules," and our new variable change with the time period, and what an individual feels they deserve is a social product and not an absolute or the derivative of an innate or universal right. This is not to say that humans are not motivated by their own interests, or that we should completely disregard the premises of rational choice theory, but rather that the things of which we take interest, and how we manifest those interests, are socially determined. This was not entirely new when Granovetter proposed the concept of embeddedness (see Schelling 1979), but Granovetter's application to modern sociology is the most applicable to the method used in this paper. The theoretical assumptions that Granovetter makes corrects for the under-socialization of economic principles that often place individuals in vacuums, while still being consistent with the core tenets of rational choice theory previously outlined. This allows for a unified and consistent theory of sociological processes determining deservedness.

d. Bounded Rationality

At this point a potential function by which individuals determine what they believe they deserve has been postulated, as well as the social mechanisms for which value is placed on those variables. We have also suggested that these variables be narrowed to what could result from the existence of cognitive empathy between individuals, mainly through their understanding provided by those in a similar situation. This opens a lot of doors and potential avenues for analysis. Akerlof's function could seemingly grow into a behemoth of any variable that we can measure in order to determine what media and relationships influence the individual's sense of self-worth. Luckily, there are theories extrapolated from economics that can help group these together and narrow the field to an observable, minute, yet reliable set of variables. Theories of bounded rationality within sociology are prominent, and call for the limiting of one's own choice over preference to a subset of variables (March 1978; Simon 1972). Herbert Simon, in his work on *Bounded Rationality*, provides instances in which the situation provides an actual inability to account for all factors so individuals work with what they have. There are instances of complexity and incomplete information, where there is either no way to figure out a variable or no way to know it in the first place. This lets us rule out any variable that the individual has no means to calculate effectively, or anything they would not know. Sadly for Akerlof, individuals are probably not aware of everyone in their reference set's actual wages, or what they could be making on unemployment. It is unlikely that individuals are taking stock of the entirety of the world around them, and they are bound by the information they know, breaking it down into feelings about the world that manifest as their interest. This then allows us to group the variables that will influence the individual's perception of their own deservedness based on feelings and perceptions, rather than on the actual numbers. This conclusion provides a direction in the search for which variables exactly should be expected to influence deservedness.

e. Weak Ties

Looking towards what impacts an individual's feelings and opinions, one should start to construct an idea of who has the ability to influence an individual. Small finds that, in his study, individuals "sought people from whom they could expect what psychologists have termed cognitive empathy the ability to understand one's predicament from one's perspective" (Small 2017). Small's finding supports Akerlof's idea that the variables in the equation should involve individuals who exist in the respondent's reference set, but it seems unlikely that we would know the real answers to any of the variables. This also suggests that individuals seek out information and support from those in which they might not know deeply, but those who they put trust in to understand their particular situation. For instance, an individual seeking out how much they deserve to make might turn to Google or social media and find a swarth of individuals who were in their particular situation, providing posts and calculators and estimates, all of which influence the individual's determination. This is useful when we look towards building out the list of potential predictor variables because it directs us towards people like coworkers, people on the internet and loosely connected peers, and away from people like close friends and family.

f. Expectations and Relational Deservedness

Dating back to Samuel Stouffer's 1949 study of *The American Soldier*, the concept of relative deprivation has been prominent in the fields of psychology and sociology. It is essential here in understanding the effect that someone's financial and demographic frame of reference has on their pay (Stouffer et al. 1949). The field of deprivation theory and expectations provides an abundance of literature in both the fields of sociology and economics that is relevant to building an accurate theoretical model. The uniqueness of this study is the potential to apply some of these concepts to feelings of deservedness. Yitzhaki provides a useful definition of a reference set as "the group within which an individual confines his aspirations," while Frank and Sunstein define it more conservatively as "workers in the same firms." This study defines the reference set by how it is defined within the data used, through the subjective interpretation of the responder. The reference set consists of all the factors that the individual considers when determining their own economic and social standing. It is difficult to conclude which factors influence certain individuals over others. For example, a young person who uses social media frequently might form their reference set and expectations around individuals and material standards far from home, while an older person in a rural area may have a reference set that is influenced by individuals living on farms nearby. It is easier to deduce that a reference set influences an individual's feelings of deservedness, rather than objective factors such as income, rather than showing *which* reference set does so.

The conclusions set forth by Stouffer, Yotzhaki, Frank and Sunstein, and other theorists in the field of relative deprivation all point to the same principle that an individual uses a reference set to situate themselves in an economic and social position, but the mechanism by which this occurs, thus impacting feelings of fairness, justice, and relevantly, deservedness, has yet to be elaborated on in this paper (Stouffer et al. 1949; Yitzhaki 1982; Frank, Sunstein 2001). This is where it is helpful to turn to the works of Arlie Hochschild in her article "The Economy of Gratitude." It is apparent now that

individuals have variables that influence what they believe they deserve based on their reference group around them, but “The Economy of Gratitude” is useful for exploring how individuals relate their external surroundings to their previous conceptions of the world. Gratitude, the concept of relative deprivation, and relational benefit are very important in figuring out why individuals of similar skill might feel deserving of vastly different quantities. Hochschild writes

“A husband does the laundry, makes the beds, washes the dishes. Relative to his father, his brother, and several men on the block, this husband helps more at home ... All in all he feels he has done more than his wife could reasonably expect ... but to his wife, the matter seems altogether different ... She does 80 percent of the housework. Relative to all she does, relative to what she wants to expect of him, what she feels she deserves, her husband’s contribution seems welcome but not extra, not a gift.” (Hochschild 2003).

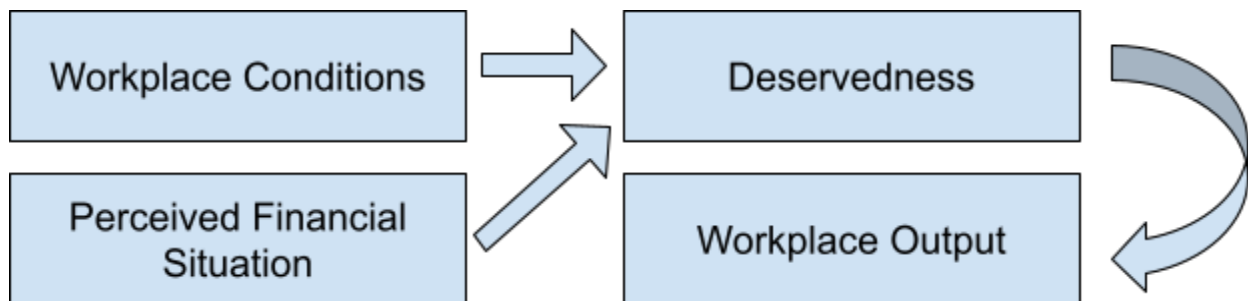
She very eloquently summarizes a few key premises previously missing from the discussed paradigm of deservedness. First, we have not previously discussed demographic disparities, and that should most definitely be looked into in further studies. Second, this allows us to understand the economy of gratitude, or the exchange of feelings of deservedness, as “janus-faced,” or having wildly contrasting appearances depending on which angle you look at it from. She writes that the exchange “faces outward to bewildering and rapid changes in the larger society and inward to the private meanings shared by two people” (Hochschild 2003). This reaffirms the principles deduced from Simon and Granovetter that any variable that is to be looked at in the study of deservedness should be done from the perception of different individuals or groups rather than from macro or objective measures, as this can lead us astray. Hochschild also introduces this paper to the concept of expectations. The men and women she studies form expectations about the world based on their ideologies and dispositions. The author illustrates the process by which individuals internalize the perceived realities within their reference set, construct ideologies and beliefs about the world from their reference sets, and base their expectations off of these ideologies and opinions of what society should be. This paper proposes that this process can be applied to the concept of deservedness. Furthermore, one could extrapolate that the shifts in ideologies, and the factors that influence them, can help us understand the expectations of wide swaths of social groups, predicting economic desire. For example, the man and woman in the previous example have different expectations for male participation in household labor. If social progress moved to favor the woman’s opinion, we could expect to see a wider amount of women expecting their husband’s to work more at home. This is useful in the wider study of the implications of social movements on deservedness. The “Fight for Fifteen” movement is a good example. The relatively arbitrary number of \$15 gained traction and became a battle cry for those in favor of raising the minimum wage to \$15/hour. This influenced other’s feelings of deservedness, spreading like wildfire and becoming a prominent opinion for many. This is evident not only in the public popularity, but also in 7.1 million members in the organization and the \$61.5 billion in annual raises they are credited with between 2012 and 2016 (Ashby 2017).

It also follows that individuals who feel that they are working harder than others, individual who feel like their job is more stressful or difficult than others, or who feel like their work is less valued than others, will all feel like they are not getting what they deserve more often for the same wage because they believe they deserve more than others who receive as much as they do but have relatively

easier jobs. This is supported by the findings in Akerlof and Yellen’s fair wage-effort hypothesis published in 1990 and the mechanism behind the relationship between work risks and hazard pay found in Ruhnke et al. 2022. Using the process that Hochschild theorizes, and drawing on the work in relative deprivation by previous theorists, one can isolate that the variables that would explain deservedness would include those which help us understand their beliefs and ideologies around their own subjective standing in their economic, social and occupational spheres. This directs the focus towards two groups of variables to understand deservedness. The two major categories are as follows:

1. Perceptions of relational financial situation
 - a. High opinion of financial situation in relationship to others (+)
 - b. High opinion of their standard of living (+)
2. Perceptions of workplace situation
 - a. Respect from management (+)
 - b. Work intensity and danger (-)
 - c. Feelings of ownership or joy with work (+)

Notably, factors that would not impact their feelings of deservedness would be their income and their standard of living compared to close individuals, such as their parents. The first because our model suggests only perceptions of relative income are important, and the second because the theory of weak ties suggests their perceptions of deservedness are more influenced by looser connections. Thus we can hypothesize that the flow chart from before, as well as Coleman’s boat, can be filled in as such:



g. Organizational Behavior

The relationality of the variables involved prompts a structuralist perspective whereby social groups are determinants of feelings of deservedness based on their demographically predictive traits and based on Granovetter’s theories of weak ties and relative closure within groups, but this would be misinformed. The theory, although semi-structuralist in practice, relies on the individual perceptions, upbringings, and information received by each worker. This is why workers who operate feet from each other each day on a factory floor can have drastically different expectations for what they believe they deserve to make, although the influence of coworkers and peers is significant. Neglecting this would be a mistake and could cause issues in union organizing and other organizational efforts. The macro effects of the theory are evident, and could be used to supplement theories of isomorphism and collective rationality, like that of DiMaggio and Powell. They theorize that organizations over time tend to trend in similar

directions; “structural change in organizations seems less and less driven by competition or by efficiency. Indeed, we will contend, bureaucratization and other forms of organizational change occur as the result of processes that make organizations more similar without necessarily making them more efficient” (DiMaggio and Powell, 147). They theorize that there are three types of isomorphic processes, coercive, mimetic and normative. I argue that the type of social pressure that we have discussed would be considered a form of coercive isomorphism. They define coercive isomorphism as the “results from both formal and informal pressure exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function” (DiMaggio and Powell, 150). The power of unions, governments and employees acting on the interests of what employees feel they deserve could serve as formal efforts to pressure organizations, and since what one person feels they deserve influences their coworkers, families, neighbors, and anyone they come in contact with online, the expectations spread, forcing organizations to take similar pathways. Just this year, following Amazon, eight fortune 500 companies raised their wages to \$15/hour or more (Forbes). Amazon responded to pressure from the media, employees, and the public. The pressure resulted from a disparity between pay, working conditions and feelings of deservedness. This gets the snowball rolling, and before you know it you have coercive processes of isomorphism based on shared expectations and shared feelings of deservedness. This plays out in other areas as well, including the salary negotiation process, expectations over healthcare, and expectations of paid family-leave.

There now exists a cohesive theoretical foundation for understanding how individuals form their concepts of deservedness. We can see evidence from recent movements that these theories play out in a way that is inline with existing social theory. Based on the evidence, and interlocking of existing theory, it becomes clear that deservedness is a function of an individual’s perception of their own financial situation in relation to the world, their community, their workplace, et cetera in conjunction with their treatment at work.

III. Relevant Previous Research

Empirical work has been done in more recent history regarding the development of feelings of fairness and deservedness in individuals. Consistent with Akerlof and Yellen’s fair wage-effort hypothesis published in 1990, Gächter and Thöni find that “disadvantageous wage discrimination leads to lower efforts” (Gächter, Thöni 2010). This confirms the importance of studying this topic for those that hope to improve their employees’ output, government officials aiming to improve quality of life and domestic output, as well as union organizers looking for arguments to increase wages. Empirically and theoretically, in both the 20th and 21st century, we can now provide for the fact that providing for what individual’s feel is fair for themselves will in turn increase their output. What determines their sense of fairness has also been addressed empirically. If the hypotheses drawn from the theoretical works hold true, we should expect to see significant relationships between variables addressing feelings of respect, working conditions, and relational financial situation and feelings of deservedness and fairness.

Hawkins et al. published a 1995 study concluding that feelings of appreciation and respect are essential in understanding fairness. They found that “in a sample of 234 dual-earner wives randomly selected from metropolitan areas of the western United States ... feelings of appreciation were the strongest predictor of fairness” (Hawkins et al. 1995). This is again confirmed by the 2012 study by Augsberger et al. in which they studied factors for leaving the child welfare sector. They write that “based on the qualitative findings, researchers designed the Respect Scale, a quantitative scale measuring the concept of perceived respect. Results from the logistic regression found that workers who score lower on the Respect Scale were significantly more likely to intend to leave their current job” (Augsberger et al. 2012). It is also clear that among stigmatized groups, including gender and racial minorities, the handicapped, and women that workplace respect is even more important. Henry et al. confirmed in their 2011 study that “among a nationally representative sample of American adults, members of stigmatized groups showed a stronger relationship between respectful treatment and job satisfaction compared to their non-stigmatized counterparts”(Henry et al. 2011). They also show that pay was not a great predictor of job satisfaction (proxy for feelings of fairness), showing that the social factors and perceptions carry more weight than the tangible earnings, aiding in providing for the theoretical model. These more updated quantitative approaches serve to reaffirm the influence that feelings of respect and appreciation have on an individual's feelings of fairness and thus their work output. The literature regarding this is fairly decisive.

Regarding the impact of work effort and specifically workplace conditions, the literature is only somewhat split. Some studies suggest that cultural factors may be a large influence in what matters most to individuals in determining feelings of fairness. For example, Hundley and Kim in their 1997 study write that “Korean pay fairness judgments were found to be relatively more sensitive to differences in seniority, education, and family size, and American pay fairness judgments were relatively more sensitive to variations in individual job performance and work effort” (Hundley and Kim 1997). The American results are consistent with the theoretical model previously proposed, effort and leniency are directly correlated with feelings of fairness. The relationship of seniority, education, and family size with feelings of fairness contributes the other factors in the model, such as comparisons with your past self, relationship to lifestyle accustomization and cultural ties to respect. For example, respect for family size and seniority might be more prevalent in Korea while respect for effort and performance is more prevalent in the United States. More data that supports the correlation between more dangerous or difficult jobs and lowered job satisfaction and perceptions of fairness can be found in a study of 2,850 Finnish workers across fields (Böckerman 2006). This could indicate that factors like leniency in the workplace, workplace efficiency and smoothness, and ownership over work product could be indicators of deservedness. The variables used in these studies, such as fairness and satisfaction could serve as temporary proxies for deservedness, while the predictor variables used could serve as temporary proxies for the variables in the theoretical model. This is supported by Hawkins et al., 1995; Augsberger et al., 2012; Henry et al. 2011 and their use of similar proxy relationships. They configure a proof of concept for the model while not specifically asking about the variables this model uses.

Lastly, in perhaps the closest study to the one conducted here, Dornstein investigated the determinants of fairness in pay in Israel. Dornstein writes: “The findings indicate that pay fairness evaluations may be based on comparisons with similar as well as dissimilar others; that they are guided

by norms of contribution as well as norms of need; that feelings of inequity develop where inputs/investments are undervalued in terms of prevalent norms of just exchange ratios. The findings also indicate that variances in the individuals' frames of reference are partly related to a variety of background characteristics such as sex, age, income, education, etc.” (Dornstein 1989). This study serves to justify the claim that understanding relational perspective is essential to understanding the determinants of fairness in pay. As the quantitative data from Dornstein shows, and the conclusions from Henry et al. reaffirm, pay is not as large an influence on an individual's feelings of fairness as the situation of those around them and how respected they feel. This study would test if the conclusions drawn in those studies, principally the lack of importance placed on income, would apply to deservedness as well.

All of the conclusions drawn from quantitative analysis of data collected from individuals on feelings of deservedness by those in the field serve to aid in the support of the model concluded from the theoretical and qualitative works done prior. Dornstein's work in Israel and the understanding of Hundley and Kim's work through proxy variables serve as affirmation that the theory will hold regardless of the nation in which it is tested. This exemplifies the versatility of a theory that adjusts for the reference set and culture that an individual finds themselves, but also highlights a potential flaw in the vagueness and generality apparent in such a theory. This can be combated by weighting future survey variables by relative importance in that culture based on initial results. By this I mean that instead of treating every variable as equally important when making policy or employment decisions, weigh the variables that are most important to that particular group most (Sharot 1986).

IV. Data and Methods

a. The General Social Survey

The General Social Survey (GSS) is taken by the nonpartisan and objective research organization (NORC) at the University of Chicago each year and polls adult Americans about their social, political and financial attributes and opinions. The goal of using this survey was to analyze the factors that influence the outcome variable of feelings of deservedness over an individual's wages. The variable of fairness was used as a just proxy not only for conceptual synonymosity, but because of the phrasing of the question and answer options. The question posed was precisely what needed to be asked: “How fair is what you earn on your job in comparison to others doing the same type of work you do?” The response options were “More than I deserve,” “Much more than I deserve,” etc. These were coded to be either yes, they received what they felt they deserve or more, or no, they did not, in order to perform a more rigorous regression. The other variables considered included proxies for workplace conditions, such as respect, workplace freedom, job security, and supervisor help. The variable of the respondents perceived standard of living compared to their parents' was used as a proxy for the influence of one's reference set on their feelings of deservedness. The variable of “Opinion of Family Income” was used to understand how the individual saw themselves in relation to the world. A variety of demographic variables were included as controls, such as age, education level, sex, and race. Another variable included was the year the survey was taken to ensure that this did not have an effect and the results were somewhat more generalizable. The final variables included the family and individual incomes, adjusted

for inflation. The common conception of deservedness is that dissatisfaction should go down as income increases, but our theoretical model with relative expectations suggests otherwise. This is why they are included. The survey was used for years that the outcome variable question was asked, including 2002, 06, 08, 10, 14 and 18. (n =7146).

General Social Survey Variables

Variable Label	Question Text
Family income in constant dollars	Inflation-adjusted family income.
Respondent income in constant dollars	Inflation-adjusted personal income.
Age of respondent	Respondents Age
Highest year of school completed	What is the highest grade in [school] that you finished and got credit for? How many years did you complete?
Respondents sex (ref =Female)	Respondents Sex
Race of respondent (ref =Black)	What race do you consider yourself?
Satisfaction with financial situation	A. We are interested in how people are getting along financially these days. So far as you and your family are concerned, would you say that you are pretty well satisfied with your present financial situation, more or less satisfied, or not satisfied at all?
Opinion of family income (ref =Above Average)	Compared with American families in general, would you say your family income is far below average, below average, average, above average, or far above average?
R's living standard compared to parents (ref =Better)	Compared to your parents when they were the age you are now, Do you think your own standard of living now is much better, somewhat better, about the same, somewhat worse, or much worse than theirs was?
R treated with respect at work (ref =no)	Please tell me whether you strongly agree, agree, disagree, or strongly disagree with each of these statements. At the place where I work, I am treated with respect
Workplace runs in smooth manner (ref =no)	The place where I work is run in a smooth and effective manner
A lot of freedom to decide how to do job (ref =no)	I am given a lot of freedom to decide how to do my own work
Promotions are handled fairly (ref =no)	Promotions are handled fairly
The job security is good (ref =no)	The job security is good
Supervisor helpful to R in getting job done (ref =no)	My supervisor is helpful to me in getting the job done
How fair is what R earn on the job <i>(Outcome Variable)</i>	How fair is what you earn on your job in comparison to others doing the same type of work you do?

GSS_clean[c("Year", "Sex", "Race", "Fairness in Pay", "Satisfied with financial situation", "Age", "Years of Education", "Income", "Family Income", "Opinion of Family Income", "Feels Respected At Work", "Work Runs Smoothly", "There is generally freedom at work", "Promotions are handled fairly", "Has Job Security", "Direct Supervisor is helpful")]

16 Variables 7146 Observations

Year

n	missing	distinct	Info	Mean	Gmd
7146	0	5	0.957	2009	6.581

lowest : 2002 2006 2010 2014 2018 , highest: 2002 2006 2010 2014 2018

Value	2002	2006	2010	2014	2018
Frequency	1742	1666	1131	1214	1393
Proportion	0.244	0.233	0.158	0.170	0.195

Sex

n	missing	distinct
7146	0	2

Value	Female	Male
Frequency	3692	3454
Proportion	0.517	0.483

Race

n	missing	distinct
7146	0	3

Value	Black	Other White
Frequency	1088	687 5371
Proportion	0.152	0.096 0.752

Fairness in Pay

n	missing	distinct
6520	626	2

Value	No	Yes
Frequency	2947	3573
Proportion	0.452	0.548

Satisfied with financial situation

n	missing	distinct
6265	881	2

Value	No	Yes
Frequency	1614	4651
Proportion	0.258	0.742

Age

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
7124	22	69	1	42.61	15.25	23	25	32	42	53	60	65

lowest : 18 19 20 21 22 , highest: 84 85 86 87 88

Years of Education

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
7129	17	20	0.972	14.02	3.052	10	11	12	14	16	18	19

lowest : 1 2 3 4 5 , highest: 16 17 18 19 20

Value	1	2	3	4	5	6	7	8	9	10	11	12
Frequency	1	22	10	7	5	37	15	75	123	180	257	1819
Proportion	0.000	0.003	0.001	0.001	0.001	0.005	0.002	0.011	0.017	0.025	0.036	0.255

Value	13	14	15	16	17	18	19	20
Frequency	662	1061	402	1329	316	413	136	259
Proportion	0.093	0.149	0.056	0.186	0.044	0.058	0.019	0.036

Income

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
7146	0	101	0.979	27924	33880	-100	-100	-100	18745	39695	63318	88211

lowest : -100 350 369 441 486 , highest: 145099 158656 182695 189740 235707

Family Income

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
7146	0	125	0.999	51891	46468	-100	5351	20322	40645	70100	112160	160197

lowest : -100 350 369 401 441 , highest: 152908 158201 160197 160742 178266

Opinion of Family Income

n	missing	distinct
6240	906	3

Value	Above Average	Average	Below Average
Frequency	1520	3012	1708
Proportion	0.244	0.483	0.274

Feels Respected At Work

n	missing	distinct
7132	14	2

Value	No	Yes
Frequency	574	6558
Proportion	0.08	0.92

Work Runs Smoothly

n	missing	distinct
7106	40	2

Value	No	Yes
Frequency	1652	5454
Proportion	0.232	0.768

There is generally freedom at work

n	missing	distinct
4900	2246	2

Value	No	Yes
Frequency	910	3990
Proportion	0.186	0.814

Promotions are handled fairly

n	missing	distinct
3960	3186	2

Value	No	Yes
Frequency	1876	2084
Proportion	0.474	0.526

Has Job Security

n	missing	distinct
4846	2300	2

Value	No	Yes
Frequency	966	3880
Proportion	0.199	0.801

Direct Supervisor is helpful

n	missing	distinct
4474	2672	2

Value	No	Yes
Frequency	1022	3452
Proportion	0.228	0.772

b. Federal Employee Viewpoint Survey

The 2021 Federal Employee Viewpoint Survey (FEVS) is a yearly survey of federal employees administered by the Office of Personnel Management. It asks questions aimed at garnering the employees perceptions of how their office operates, their perceptions of their work life, their opinions of their supervisors, managers and high-level officials. Luckily for this study, the survey also asks the respondents about their satisfaction with their wages. Sadly, the question is not as clear as it is in the GSS, but it will be useful to confirm results offered by the GSS. The survey's benefits and drawbacks make it uniquely suited for confirming the results of the GSS, but not for providing its own results because of the lack of clarity. The benefits of the employee viewpoint survey is that the number of viable respondents is much larger than the GSS (n=624800) and the questions are geared towards the place of work which allows greater insight into workplace behavior. But, since the survey is aimed at improving productivity and happiness in the workplace, the questions are not asked in the same way that questions geared for social science are. The variables included for this survey include pay satisfaction, which will be used as a proxy for deservedness. This is not a perfect substitute, but that is another reason this is solely a confirmation and reaffirming evidence. The other variables include those aimed at gaining information on workplace conditions like respect, work/life balance, and personal accomplishment. Demographics are included as well.

Federal Employee Viewpoint Survey Variables

Variable Label	Question Responses
I am satisfied with my pay (Outcome Variable)	0 (no) or 1 (yes)
Sex	Are you: A (Male) or B (Female)
Race	Please select the racial category or categories with which you most closely identify (Black, White, Asian, Other Group)
Age	What is your age group? A (Under 40) or B (Over 40)
My Boss Respects Me	5 (Strongly Agree), 4 (Agree), 3 (Neither Agree nor Disagree), 2 (Disagree), 1 (Strongly Disagree)
Senior Leaders Demonstrate Support for Work/Life Programs	5 (Strongly Agree), 4 (Agree), 3 (Neither Agree nor Disagree), 2 (Disagree), 1 (Strongly Disagree)
My work gives me a feeling of personal accomplishment	5 (Strongly Agree), 4 (Agree), 3 (Neither Agree nor Disagree), 2 (Disagree), 1 (Strongly Disagree)
Overall, how good a job do you feel is being done by your immediate supervisor?	5 (Strongly Agree), 4 (Agree), 3 (Neither Agree nor Disagree), 2 (Disagree), 1 (Strongly Disagree)

FEVS

9 Variables 624800 Observations

I am satisfied with my pay

n	missing	distinct
614373	10427	2

Value	0	1
Frequency	193050	421323
Proportion	0.314	0.686

I am satisfied with my pay2

n	missing	distinct	Info	Sum	Mean	Gmd
614373	10427	2	0.646	421323	0.6858	0.431

Sex

n	missing	distinct
563651	61149	2

Value	Female	Male
Frequency	254663	308988
Proportion	0.452	0.548

Race

n	missing	distinct
531978	92822	4

Value	Asian	Black	Other	White
Frequency	30254	76837	34898	389989
Proportion	0.057	0.144	0.066	0.733

Age

n	missing	distinct
564175	60625	2

Value	40 or Older	Under 40
Frequency	433555	130620

Proportion	0.768	0.232
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My Boss Respects Me

n	missing	distinct	Info	Mean	Gmd
621647	3153	5	0.806	4.33	0.8758

lowest : 1 2 3 4 5 , highest: 1 2 3 4 5

Value	1	2	3	4	5
Frequency	14922	20351	45042	205820	335512
Proportion	0.024	0.033	0.072	0.331	0.540

Senior leaders demonstrate support for Work/Life programs

n	missing	distinct	Info	Mean	Gmd
574976	49824	5	0.911	3.765	1.168

lowest : 1 2 3 4 5 , highest: 1 2 3 4 5

Value	1	2	3	4	5
Frequency	30721	41463	120122	222436	160234
Proportion	0.053	0.072	0.209	0.387	0.279

My work gives me a feeling of personal accomplishment

n	missing	distinct	Info	Mean	Gmd
618334	6466	5	0.881	3.943	1.071

lowest : 1 2 3 4 5 , highest: 1 2 3 4 5

Value	1	2	3	4	5
Frequency	23657	43182	81010	267358	203127
Proportion	0.038	0.070	0.131	0.432	0.329

Overall, how good a job do you feel is being done by you immediate supervisor?

n	missing	distinct	Info	Mean	Gmd
623361	1439	5	0.845	4.198	1.018

lowest : 1 2 3 4 5 , highest: 1 2 3 4 5

Value	1	2	3	4	5
Frequency	18034	27231	82929	180441	314726
Proportion	0.029	0.044	0.133	0.289	0.505

c. *Methods*

Data was taken from public access sites for both the GSS and the FEVS. Results were imported, filtered, and analyzed using the statistical computing language “R.” Data was filtered for responses that included viable answers for the outcome variables (nothing left blank, nothing that suggested the respondent did not understand the question). The data was cleaned and encoded consistent with bivariate analysis, and summary statistics were generated using the *bmisc()* package. Variables were first tested with all variables in the model in a probit likelihood model (GSS Model 1 and FEVS Model 1). The probit regression analysis was used instead of a logit regression so that the model can be generalized to account for non-constant error variances should the variance not be equivalent across responses. This, in turn, means the results should be interpreted as relative likelihood instead of odds-ratios. A second model was then produced based on the statistically significant variables from the first models (GSS Model 2 and FEVS Model 2). These methods are standard in the field of sociology and have been for some time, and so a more modern method was added in addendum to the typical probit regression.

The first thing done in the second method was to effectively code data that was presented as categorical data by removing continuous data and the target variable, then one-hot-encoding the categorical data so that it presented itself as continuous data. Ordinal results were label-encoded respectively. One-hot-encoding is standard practice and is commonly accepted as a viable solution for handling categorical data in quantitative assessments (Kao et al. 2020; McGinnis et al. 2018). After this, the categorical data was presented as values of zero and one, causing the continuous variables to have vastly disproportionate impact during logistic regression because of their large size. For this reason, a min-max scaler was used to conform all continuous variables to the effect size and make the variables weighting similar, while correcting for responses with missing variables (Dey et al. 2018; Salkind 2010). The final step prior to model construction was feature selection with a recursive feature eliminator (RFE) using logistic regression. Sun et al. describes an RFE by saying: “algorithms such as recursive feature elimination (RFE) are used to identify how important each predictor is. In this procedure, the least important predictor(s) is eliminated from the predictive model in successive iterations, each time estimating the model’s overall performance, until prediction performance drops substantially. With RFE, researchers can thus isolate a small set of predictors that together have predictive power that is equivalent to that of the original, larger set of predictors.” (Sun et al. 2020). This is also a commonly accepted practice to narrow down variables from a larger set based on importance (Sun et al. 2020; Brink et al. 2017). The last and final step was to build a logit regression model using the most important features as selected by the RFE. This is important as it was not limited by the theoretical impositions of the researcher, but rather the pure statistical significance such that alternate hypotheses could present themselves should they be made apparent throughout the analysis. As such, the entire set of relevant variables from the GSS was used with the year 2000 responses (n=1022).¹ The first chart includes the results of the probit regression, while the second is the results of the RFE.

¹ This particular dataset was used because it asked the question “Do you believe you get what you deserve at work?” and asked many other variables not available throughout every year.

	Probit Likelihood			
	GSS Model 1	GSS Model 2	FEVS Model 1	FEVS Model 2
(Intercept)	-18.94 (16.54)	-0.17** (0.07)	-1.72*** (0.01)	-1.63*** (0.01)
Year	0.01 (0.01)			
SexMale	0.23* (0.09)		-0.06*** (0.00)	
RaceOther	-0.07 (0.17)		0.05*** (0.01)	
RaceWhite	0.19 (0.12)		0.25*** (0.01)	
Age	-0.00 (0.00)			
`Years of Education`	0.02 (0.02)			
Income	0.00 (0.00)			
`Family Income`	0.00 (0.00)			
`Opinion of Family Income`Average	-0.12 (0.13)	-0.22*** (0.06)		
`Opinion of Family Income`Below Average	-0.39** (0.15)	-0.66*** (0.07)		
`Feels Respected At Work`Yes	0.25 (0.21)			
`Work Runs Smoothly`Yes	0.55*** (0.15)	0.35*** (0.06)		
`There is generally freedom at work`Yes	-0.16 (0.14)			
`Promotions are handled fairly`Yes	0.38** (0.12)	0.59*** (0.05)		
`Has Job Security`Yes	0.07 (0.15)			
`Direct Supervisor is helpful`Yes	0.20 (0.14)			
`Standard of living compared to parents`Same	-0.19 (0.11)			
`Standard of living compared to parents`Worse	-0.14 (0.14)			
RaceBlack			0.08*** (0.01)	
AgeUnder 40			-0.22*** (0.00)	
`My Boss Respects Me`			0.07*** (0.00)	0.06*** (0.00)
`Senior leaders demonstrate support for Work/Life programs`			0.23*** (0.00)	0.23*** (0.00)
`My work gives me a feeling of personal accomplishment`			0.19*** (0.00)	0.19*** (0.00)
`Overall, how good a job do you feel is being done by you immediate supervisor?`			0.06*** (0.00)	0.07*** (0.00)
AIC	1099.58	3806.95	529326.50	627244.25
BIC	1190.46	3837.07	529437.38	627300.44
Log Likelihood	-530.79	-1898.48	-264653.25	-313617.13
Deviance	1061.58	3796.95	529306.50	627234.25
Num. obs.	883	3051	483003	560794

*** p < 0.001; ** p < 0.01; * p < 0.05

IV. Results

a. Probit regression

From the GSS data there were three statistically significant ($p < 0.01$) variables which were expected. The first was the opinion of family income. This was the most strongly associated variable whereby a lower opinion of one's income indicated one was less likely to believe they were being paid what they deserve, regardless of their actual income or their family's income. This was confirmed again by the second model which showed both alternatives to be ordinaly predictive (the more severe having a greater absolute coefficient than the less severe) and statistically significant. The other two variables that held statistically significant power were related to workplace situations. The first was that when work runs smoothly, individuals are more likely to believe they are getting what they deserve. This contributes to the thesis but forward by Akerlof and here. Leniency and high ease of work create situations where individuals feel that they deserve less, while constant crises and stress make individuals believe they deserve more. This could be why the pandemic increased calls for hazard pay (Liotta 2020). The last and relatively least significant variable was the fairness in promotions. The higher the likelihood that the promotions were fair, the higher the likelihood that individuals believe what they were getting is fair. This is important because it situates individuals not only in an occupational and financial setting, but also on a social hierarchy, attaching financial weight and feelings of justified superiority to their position and the positions of those around them. They feel like they and their peers are being valued accurately in terms of hierarchy, influence and power, even if the pay is kept the same. This variable is interesting because if the demographics and income are not kept constant, it and opinion of family income become more predictive, while work running smoothly becomes less predictive. The predictive power of the model holds independent of constraints. For the FEVS all variables yielded statistical significance because the number of responses was just so abundant, but the variables that yielded strong predictive power ($>.15$) were being white, being under 40, support for Work/Life balance programs, and feeling personal accomplishment in your work. This adds a new

	coef	std err	z	P> z	[0.025	0.975]
Race of respondent_White	0.0054	0.112	0.049	0.961	-0.214	0.225
Were rs parents born in this country_No answer	20.1371	1.61e+04	0.001	0.999	-3.14e+04	3.15e+04
Total family income_\$4000 to 4999	0.6104	0.908	0.672	0.501	-1.169	2.389
Total family income_No answer	1.1716	1.054	1.111	0.267	-0.895	3.238
Is r likely to lose job_No answer	-24.2964	9.52e+04	-0.000	1.000	-1.87e+05	1.87e+05
Job or housework_A little dissat	-1.0248	0.323	-3.176	0.001	-1.657	-0.392
Job or housework_Don't know	-18.7085	6450.700	-0.003	0.998	-1.27e+04	1.26e+04
Rs self ranking of social position_2	-1.3739	0.466	-2.950	0.003	-2.287	-0.461
Rs self ranking of social position_9	-1.6604	0.765	-2.170	0.030	-3.160	-0.161
Rs self ranking of social position_Top	0.4287	0.448	0.957	0.339	-0.449	1.307
Satisfaction with financial situation_Don't know	23.5427	8.31e+04	0.000	1.000	-1.63e+05	1.63e+05
Satisfaction with financial situation_Not at all sat	-1.1786	0.178	-6.630	0.000	-1.527	-0.830
Opinion of family income_Above average	0.5707	0.175	3.262	0.001	0.228	0.914
Inequality due to lack of solidarity_Strongly disagree	0.7592	0.314	2.415	0.016	0.143	1.375
Conflict between poor and rich in usa?_Cant choose	0.3798	0.306	1.243	0.214	-0.219	0.979
Workers and management in conflict?_No conflict	-1.1820	0.491	-2.409	0.016	-2.144	-0.220
Conflict between social top and bottom_Very strong conflicts	-0.8394	0.159	-5.264	0.000	-1.152	-0.527
Rank in society of r_No answer	0.4732	0.385	1.230	0.219	-0.281	1.227
Does r own or rent home?_No answer	-1.8718	1.090	-1.718	0.086	-4.008	0.264
Respondent income in constant dollars	0.6875	0.384	1.788	0.074	-0.066	1.441

demographic level to the previous model, showing that white older people are more likely to feel like they are getting what they deserve, while younger people are less likely to. This should be taken lightly, though, as income cannot be controlled for in this model, and white, older folks are more likely to have more money.

b. RFE and Logistic Regression

The recursive feature elimination used yielded similar results to the probit regression, providing further evidence for the significance of the variables chosen in the probit regression. The negatively correlated significant variables included dissatisfaction with their place of employment, ranking oneself low or high in social positioning, being unsatisfied with one's financial position, and believing that there are strong conflicts between the social top and bottom. The positively correlated significant variables included having an above average opinion of one's family income. This serves as confirmation of the probit regression, but also adds a more social element that the probit regression missed: the conflict between the social top and bottom.

V. Discussion

The hypotheses presented in the theoretical portion seem plausible based on the quantitative results present in the GSS. One thing that the literature does not do well to address is the relative impact that the social components have on individuals' feelings of deservedness. This could be a good place for further study. Individuals who felt that there was strong conflict between the top and bottom of society were much more likely to feel that they were not getting what they deserve. The impact of social and political awareness is important to the study of the development of deservedness because of how it fits into the theoretical model. Previously, it was hypothesized that the fair wage was ultimately determined by what is present in the individual's direct frame of reference; i.e., their family, friends, and workplace (Akerlof 1982). But as technology and access to information and the ability to become socially and politically aware has risen, so has the influence of the greater social and political sphere on the individual's development of preferences. Their rationality is a bit less bounded as information access increases, allowing their decision functions to broaden into the social world. This could also be the reason that an individual's perception of their own standard of living in relation to their parents was not a significant predictive factor, yielding weak results and no statistical merit. The correlation should be even more clear in the present day, and this would serve as a fruitful future study.

This new development should fit into the previous understanding that the literature agrees on, that deservedness is largely predicted by feelings of respect in the workplace and perceptions of relative financial position. This is also confirmed by the data which is to be expected. There are many more directions to go with this, including using more advanced quantitative methods such as support-vector-machines and loglinear models for contingency tables if one decided not to encode the categorical data. All in all the greatest limits to this study were the need for using proxy variables in certain cases because of the resource limit on conducting a brand-new survey. This study could go further to suggest group action once the fair wage has been decided. It is possible to extract a game theoretical model whereby the employees engage in a back and forth with their employers where they

wage effort and work output in exchange for leniency, respect and wages. This model could explore striking, laziness, and output overall. This would be a future study that could build off of this model using more updated data and theoretical compositions.

Thibaut and Kelley put forth the social exchange theory whereby individuals form comparison levels and only shift when they find something that they believe will make them better off. They may hate their job, but if they do not think they can find anything better, they simply will stay (Thibaut, Kelley 1959). Apart from leaving their job, they could also be doing things to improve their wages or place of employment. This tells us something about the individuals we are looking at in our data. The data serves as a snapshot or cross-section, merely a moment in time in the world. The individuals who feel like they are not getting what they deserve are either in the process of moving jobs, feeling like they cannot get a better job or it is too difficult, or they are actively working to improve their place of employment or wages. This adds to the fluidity of the process and how it should be studied over time and qualitatively to understand the mechanisms at play in individuals' decision-making processes. This would help add another dimension to the currently wholly algorithmic understanding of the process.

Interestingly, there was not a resounding correlation associated with feeling respected at work, although it did provide a weak correlation in both surveys and statistical significance in the FEVS. This does not suggest that employees do not want to be respected, but perhaps that it is not as strong of a time to feelings of deservedness as previously thought. Perhaps the more tangible and socially recognized variables (such as a work/life balance, higher rankings, ease of work), which are byproducts of respect, are more easily related in the minds of the respondents, and the connection is more salient. This suggests that it is not merely the words of a leader, as leadership performance overall showed little predictive power, but the actions of them. This is useful for employers hoping to use this information to boost productivity in the workplace without increasing wages, or labor organizers hoping to increase material benefits by showing it can improve productivity while mere words will not.

This was a productive study analyzing the effect of employees' perceptions of their financial situation, perceptions of workplace environment, and perceptions of the national political and social sphere on feelings of deservedness over their wages. This study used a recursive feature elimination process to assess the importance of variables included in the general social survey on feelings of deservedness, and after limiting the number, assessed the importance of factors that showed statistical significance in a binomial logistic regression. This study shows that objective factors, like Yitzhaki and Frank and Sunstein theorized, held a relatively small correlation with feelings of deservedness as opposed to subjective social and economic factors (Yitzhaki 1982; Frank, Sunstein 2001). Conclusively, perceptions of the workplace environment, financial situation, and the wider social and political sphere impact individuals feelings of deservedness. There were limitations to this study that involved a lack of access to both qualitative and quantitative data and a limit in technological skill set. Future studies could implement data that is more recent, larger in size, and taken over time by the same individuals. Studies should explore the relationship between the wider social and political sphere on deservedness more fruitfully and significantly. This could look like a prompt based study asking respondents frequently about their workday and opinions on political, economic and social conditions, drawing more precise correlations. Theoretical pushes could be made to understand group behavior through

this model as well. More work should also be done connecting this into the last leg of Cole's model, showing how the increased productivity changes macro level social phenomena.

Note:

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