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**Degrees of Relevance: Does Education Socialize or Signal?**

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**Degrees of Relevance: Does Education Socialize or Signal?**

by

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## **Degrees of Relevance: Does Education Socialize or Signal?**

by

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A classic but unresolved debate regarding the American stratification system is the precise nature of the underlying causal processes by which education is associated with socioeconomic attainment. One traditional view of education is the technical-functional or human capital approach which posits that education augments productive capacities by imparting valuable analytic and cognitive abilities, technical competences, and significant social or communication skills. A contrasting view is the signaling approach, which downplays the intrinsic significance of schooling, and instead emphasizes the role of educational credentials in certifying, legitimating, and rationing employment in higher-paying jobs. As the labor market becomes increasingly polarized with the decline of unions and the downsizing of the traditional manufacturing sector, educational attainment is becoming increasingly significant for socioeconomic attainment, and this classic debate is thus becoming even more relevant to understanding inequality in contemporary America. To shed new light on this issue, this analysis investigates the 2003 National Survey of College Graduates, which includes data on workers' assessments of the extent to which their educational background is utilized in their jobs and work activities. The results of this analysis indicate that individuals whose degrees are highly relevant to their current occupation have significantly higher salaries than individuals whose degrees are less relevant, controlling for the level of degree. These findings provide evidence for human capital arguments by showing that education which augments productive capacities has greater rates of return than education that simply provides one with higher levels of credentials.

## Table of Contents

<b>Introduction .....</b>	<b>1</b>
<b>The Relationship Between Educational Attainment and Adulthood Socio-economic Status .....</b>	<b>2</b>
Human Capital Theory .....	4
Credentialing Theory.....	6
<b>Contemporary Research That Evaluates Human Capital Theory and Credentialing Theory.....</b>	<b>9</b>
Sheepskin Effects.....	9
Overeducation .....	11
<b>Methods .....</b>	<b>15</b>
<b>Research Design .....</b>	<b>15</b>
<b>Data.....</b>	<b>15</b>
<b>Variables .....</b>	<b>16</b>
<b>Models.....</b>	<b>18</b>
<b>Empirical Results.....</b>	<b>19</b>
<b>Discussion .....</b>	<b>22</b>
<b>Tables .....</b>	<b>28</b>
<b>Table 1. Descriptive Statistics for Study Variables, for Full Sample and by Gender</b>	<b>28</b>
<b>Table 2. Estimates of OLS Regression of Log-Wage .....</b>	<b>29</b>
<b>Bibliography.....</b>	<b>31</b>

## Introduction

In his 1977 article *Education as an Institution* John Meyer asserted that everyone understands that education rules in modern society. Educational attainment has an undeniable influence on later socioeconomic attainment, and while this association has received much empirical analysis, scholars have yet to come to any sort of consensus about the exact nature of this influence. Two theories have come to dominate the thirty-year-old debate on this topic. The first, Human Capital Theory, posits that education serves to socialize students and give them skills and capacities that will enhance their productivity in future jobs. The second is the credentialing view, which deemphasizes the value of the skills or knowledge learned by students, and instead underscores how education provides important credentials, which serve to signal to employers the productive capabilities of a prospective employee. These theories have been widely discussed and analyzed, yet research that compares the outcomes associated with each of these theories, namely wage, has focused heavily on the technical aspects of measuring an individual's educational attainment or determining the relevance of an individual's degree to their occupation. As a result, previous research on this topic has failed to adequately operationalize the two theories and account for the social aspects of the educational processes outlined within each theory.

This research will draw on the 2003 wave of the National Survey of College Graduates to compare the wage patterns associated with the educational process outlined in Human Capital Theory to wage patterns associated with the educational

process outlined in Credentialing Theory. Using a measure of the relevance of one's degree in relation to one's actual job, the relative significance of Human Capital Theory versus the credentialing approach to one's wage may be empirically considered.

This research does not seek to resolve this classic debate; its complexities are too extensive for any one study to fully investigate. This research can, however, provide an important piece of additional evidence that can further inform this debate. By operationalizing the theories in a new, more comprehensive way, the following analysis builds on previous research and offers further insight into the nature of the returns to education. Additionally, the analysis provides important new findings that are significant for understanding rising inequality in the contemporary American labor market.

### ***The Relationship Between Educational Attainment and Adulthood Socio-economic Status***

A decade before Meyer's assertion, Peter M. Blau and Otis Duncan's seminal study examined the role of education in social mobility. Their basic model used students' socioeconomic origins coupled with their scholastic abilities to explain educational achievement. These three factors, origin, ability, and educational achievement were then used to explain occupational achievement. The authors found that the effects of socioeconomic origins and abilities on occupational achievement in adulthood are mediated (is mediated the right word? Not sure what this means in this context) through educational achievement (Blau and Duncan, 1967).

This study showed that education is one of the best predictors of subsequent occupational and financial successes in the lives of individuals, and as such, plays a central role in the reproduction of inequality at the societal level. The Duncan model shows that associations exist between education and occupational and financial success in adulthood, but does not attempt to explain the mechanisms that create the associations. While the study shows that people with higher levels of education get higher paying, more prestigious jobs, the question remains - what are the processes that lead to this outcome?

In response to the Blau and Duncan Model, the Wisconsin Model of Status Attainment attempted to further illuminate the associations between one's socioeconomic origin, ability, and educational achievement, and their occupational achievement in adulthood. Using a social interactionist perspective, the Status Attainment Model shows that the best predictor of one's socioeconomic status as an adult (attainment) is the socioeconomic status of their father (origin) and attributes this link to the socialization process. A child's social position and ability impact how parents and teachers encourage them, which shapes the child's goals and affects the level to which the child aspires. The goals and aspirations of the child consequently have a substantial impact on the educational and occupational attainment of the child later in life (Sewell, Haller, & Portes, 1969).

In one of the most recent empirical additions to this line of research, Kingston et al.'s oft cited 2003 study drew on Human Capital Theory and Credentialing Theory to

further explore why education had such central, yet diverse, outcomes in adulthood. To do this, the researchers looked at the influence of educational attainment in five disparate, non-economic realms of life including support of civil liberties, attitudes toward gender equality, social capital, participation in elite culture, and civic knowledge. Results did not suggest that simple associations existed between educational attainment and any of those outcomes. While educational attainment was positively associated with all of these outcomes, the associations tended to be clouded by the influence of socio-demographic variables and cognitive ability. The lack of traditional findings, however, “reflects the many-sided significance of a complex institution that so decisively shapes contemporary life” (Kingston et al., 2003).

Research about the association between educational attainment and social and economic outcomes operationalizes educational attainment and socio-economic status in a variety of ways thus showing the undeniable link that exists between the two. Very few empirical studies attempt to explain the causal processes that link the two. How does educational attainment impact socioeconomic outcomes in adulthood? Human Capital Theory and Credentialing Theory have come to dominate the discourse and each describes a different set of educational and labor market processes that sort students into occupations and, accordingly, into different socio-economic positions.

### **Human Capital Theory**

Similar to the theoretical stance taken by the Wisconsin model, the human capital approach, also called the socialization model, emphasizes the transformative



aspect of schooling: “attending classes, completing assignments, interacting with teachers and fellow students, participating in school activities – all this activity and more is presumed somehow to enhance people’s intellectual abilities and knowledge, and shape their social values and personal dispositions” (Kingston et al., 54). Going to school, the theory states, not only provides students with knowledge and skills explicitly related to the curriculum, it transforms the cognitive and non-cognitive capacities of students and trains them to be trainable.

Human Capital Theory in Sociology is similar to theories that deal with physical capital in economics. When changes are made to physical items (tools, machines, etc.) that facilitate production, physical capital is created. Similarly, human capital is created when changes are made to the skills and capacities of people which make them more productive and efficient workers (Coleman, 1988, Becker, 1964). According to Human Capital Theory going to school provides students with abilities (technical capacities, analytic abilities, personal traits, etc.) that translate to productive skills in adulthood when they enter the labor market. Since people are paid according to their productive capacities, those with higher levels of educational attainment receive higher wages (Kingston, et al., 2003).

The operationalization of this theory in contemporary research largely focuses on the linear relationship between education and productivity. Economists have primarily conducted the analysis of the differences between Human Capital Theory and Credentialing Theory. In the economic modeling of Human Capital Theory, each

additional year is associated with a certain increase in productivity, wages, or another labor market outcome. The economic modeling of Credentialing Theory, on the other hand, looks at the increase in productivity, wages, or other labor market outcomes that are associated with an additional credential, rather than a single, additional year of schooling.

Not surprisingly, the Credentialing model in economics is a better fit with the modern American labor market. For many reasons completing a degree would be associated with a greater increase in productivity, wages, or other labor market outcomes than simply completing an additional year of school. To focus on the fact that Human Capital Theory assumes a linear relationship to exist between single years of schooling and productivity or wage increases represents a narrow reading of this theory. Another primary assertion of Human Capital Theory, which the previously mentioned reading ignores, is that education is transformative and provides students with useful skills and abilities, which allow them to be more productive employees. My research will consider the later assertion when operationalizing Human Capital Theory.

### **Credentialing Theory**

Max Weber's analysis of stratification serves as the bedrock of Credentialing Theory. Weber did not see education as imparting crucial technical or productive skills to students; rather he saw educational credentials as cultural-political constructs created with varying degrees of intentionality by occupational groups, organizational recruiters, school authorities, and governmental overseers (Weber, 1922). However,

scholars did not begin to take notice of this theory until the mid 1960s. Before that point researchers generally adhered to the human capital approach, and did not concern themselves with the amount of power possessed by an individual, firm, or collection of firms within a field.

The first scholars to take notice of the credentialing approach did so with a critical eye. These scholars utilized the theory to critique the ways in which the structure of educational credentials and labor markets served to limit students in a variety of ways including educationally, occupationally, socially, mentally and financially (Berg, 1971; Boudon, 1974; Freeman, 1976; Jencks et al., 1972; Meyer, 1977; Weick, 1976). This was a period when the assumption that education served only a socializing purpose was seen as naïve, but a comprehensive theory about the role of educational credentials did not exist (Brown, 2001).

The sociologist Randall Collins is credited with resurrecting Weber's work and expanding it into a theory, rather than just using it as a tool with which to critique the structure. Collins recognized the productivity enhancing features of education outlined in Human Capital Theory. His work drew on conflict theory to describe how the structural conditions of labor markets are the result of conflict between competing occupational, educational, and most importantly, status groups. Additionally, he addressed differences in productivity associated with traditional post-secondary education versus vocational or on-the-job training. Collins' treatment of the credentialing approach can be thought of as an extension of Human Capital Theory,

rather than a contradiction of it, a popular approach in contemporary research (Collins, 1971; Collins 1979; Van Der Meer, 2010).

While Credentialing Theory is largely an extension of Human Capital Theory, two foundational differences can be found between Credentialing Theory and Human Capital Theory. First, while Human Capital Theory assumes agency lies with the individual, credentialing foregrounds the structural conditions of labor markets and how that impinges upon the educational and occupational trajectories of individuals. Status attainment research using this model generally seeks to explain “large-scale, stratified, social outcomes within the individualist rubric of rational choice theory” (Brown, 2001). Second, Human Capital Theory stipulates that schooling provides people with crucial skills, whereas Credentialing Theory sees education as allocating people into particular positions in a social and occupational hierarchy. The two theories therefore are not necessarily contradictory; rather they place the analytic emphasis on different aspects of educational and labor market processes.

There are competing explanations for the rationale underlying the allocation of individuals into certain positions. According to David Bills and David Brown (2011), educational credentialism can refer to three such explanations. First, it can refer to the extent to which, at the point of hire, individuals are allocated into various places in the occupational hierarchy based on their educational qualifications. Second, it can refer to credential inflation, the process whereby the level of education required to be competitive in a particular job increases over time at a rate that far exceeds any actual

increases in technical skill required to perform that job. This interpretation of educational credentialism is usually accompanied by a moral judgment about the process and its effect on stratification in a society. The third and final interpretation of educational credentialism, used largely by labor economists and some sociologists, focuses on the non-linear returns to education and how certain levels of schooling are not rewarded in a way that corresponds to their contribution to productivity (Bills and Brown, 2011).

As the authors assert, the versatile nature of the concept of credentialing can make it difficult to investigate empirically. This paper will utilize the third definition. It is important to note, however, that the first two definitions have important implications for the contextualization of these findings and the extrapolation of these findings to wider inferences made about stratification and the reproduction of inequality.

### ***Contemporary Research That Evaluates Human Capital Theory and Credentialing Theory***

#### **Sheepskin Effects**

A number of scholars, primarily economists, have tried to compare the two theories in order to make claims about the extent to which these theories describe contemporary labor markets and wage outcomes. These scholars have sought to test so called 'sheepskin effects,' or the effect that higher credentials have on wages (Groot and Oosterbeck, 1994; Hungerford & Solon, 1987; Jaeger & Page, 1996; Weiss, 1995; van der Meer, 2010).

Research has not addressed which of these aspects of education has a greater impact on wages: degree level or degree relevance? This question parallels the longstanding debate between Human Capital Theory and Credentialing Theory.

These studies, as well as the economic perspective on this issue more generally, focus on the linearity of the relationship between education and wages assumed by each theory. Human Capital Theory would suggest a positive, linear relationship between years of schooling and wages. Credentialing Theory, however, assumes a non-linear relationship between education and wages, where wages are predicted to increase sharply during the years that coincide with the completion of the degree.

While Human Capital Theory suggests a linear relationship between years of education and productive skills and capacities, this is only part of the theory. Human Capital Theory also suggests that the underlying reason for this relationship is that the educational process imparts productive skills and capacities onto students. The second aspect of the theory is not addressed in the aforementioned empirical analyses. The analysis at hand will measure the effect of the educational process asserted by Human Capital Theory on wages in a new way. This new measurement is derived from survey participants' own assessment of the relevance of their education to their primary occupation. By measuring degree relevance in this way, inferences can be made about the extent to which an individual gained productive skills and capacities during their education.

## **Overeducation**

In recent years scholars have begun to modify Credentialing Theory to account for modern issues in the labor market, particularly the occurrence of overeducation. Overeducation, also called occupation or skills mismatch, refers to a discrepancy between an individual's attained level of schooling and the level of schooling required by the individual's job such that an individual has more schooling than is typically required of someone working in their job or occupation. Overeducation is generally thought to be the result of widely discussed credential inflation in the United States. Credentialing Theory would suggest that increases in the level of degree are associated with increases in one's wage. Research on overeducation, however, has shown that there is a point that is unique to each field or occupation past which the relationship between level of degree and wage changes. Beyond this average level of schooling, increasing levels of degrees begin to have a negative effect on returns to schooling, although not necessarily a negative effect on an individual's wage. Overeducated workers earn less than workers who have similar levels of education working in jobs for which their level of education is typical, yet still generally earn more than workers with similar jobs who have only the required level of schooling (Cohn and Kahn, 1995; Duncan and Hoffman 1981; Hartog, 1986; Hartog and Oosterbeek, 1988; Rumberger, 1987).

More recently, researchers have raised questions about the importance of the field of one's degree. They have argued that it is inadequate to examine the effect of a

mismatch between the required and obtained levels of schooling without examining mismatches between the field of education and the field of occupation. Yakusheva (2010) showed that individuals who have degrees in the field of their occupation earn more than individuals whose field of degree does not match the field of their occupation. In a similar study, Robst (2007) addressed the match between field of degree and occupation but looked at a self-report measure of degree relevance instead of a topical match between field of degree and field of occupation. This research, similar to Yakusheva's study, showed that matches between the field of education and occupation were associated with higher wages.

Both Yausheva and Robst show that a strong match between field of education and field of occupation is associated with higher wages. Earlier studies showed that increasing levels of degrees are also associated with higher wages. These fields of inquiry have remained, for the most part, discrete and no comparison has been made between the wage effects associated with increasing levels of degree and the wage effects associated with increasing levels of degree relevance. Investigating this comparison represents a new way of looking at the classic debate between Human Capital Theory and Credentialing Theory. This research will make such a comparison in order to provide further insight into which aspect of educational attainment is associated with greater increases in earnings— a higher level of degree or a higher level of degree relevance.



Previous research has shown that increasing levels of educational degrees are associated with higher wages and we expect to see that pattern emerge in this analysis. Credentialing Theory further postulates that increasing levels of schooling are increasingly rewarded but not in a way that corresponds to the education's contribution to productivity. Therefore, if higher levels of degrees are associated with higher wages, regardless of the relevance of the degree to the individual's occupation, this would indicate that the role of education in the United States is similar to that asserted by Credentialing Theory.

$$H_0: B_{DL} = B_{DR}$$

However, if the results of this analysis show that a highly relevant degree is associated with greater wage increases than a higher level of degree, then this would provide evidence that the role of education in the United States is similar to that asserted by Human Capital Theory. The educational process outlined by Human Capital Theory would suggest that a highly relevant degree, one that has provided an individual with a set of relevant productive skills and capacities, would be associated with higher wages than a high level of degree, all else equal.

$$H_A: B_{DL} < B_{DR}$$

It should be reiterated that this research does not aim to resolve the classic debate between Human Capital Theory and Credentialing Theory. Rather, it seeks to use a more sociological operationalization of Human Capital Theory to answer the following question: which educational process has greater payoffs in the United States labor market, that asserted by Human Capital Theory or that asserted by Credentialing Theory?

## **Methods**

### ***Research Design***

The National Survey of College Graduates (NSCG) from 2003 provides a unique opportunity to use nationally representative data in order to explore the influence of having an education that is relevant to one's job on that individual's wage. This research will use the respondent's own assessment of the relevance of his or her degree to his or her current occupation as a measure of the skills and capacities that the individual obtained during their education.

To test the hypotheses outlined above I will use a series of logistic regressions, which incorporate a number of independent variables related to socio-demographic characteristics, education, and occupational factors.

### ***Data***

The data used in this analysis comes from the 2003 wave of The National Survey of College Graduates, a longitudinal survey of college degree holders that is conducted every 10 years.<sup>1</sup> The target population for the 2003 NSCG was drawn from respondents from the 2000 Decennial Census who indicated that they had received a baccalaureate degree or higher in any field of study prior to April 1, 2000. The sample of the NSCG in 2003 consisted of 170,797 respondents under the age of 76 who were living in a housing unit or non-institutionalized group quarters in the United States as of April 1, 2000. Data was collected using a self-administered mail survey. Those in the target sample

were sent a pre-notification letter, a first mailing, a reminder letter and then a second mailing.

Included in the sample are people who are currently employed as well as people who are not currently employed. While the currently unemployed section of the sample can provide useful information to researchers, these respondents will be eliminated from the analytic sample since their responses fall outside the scope of the research question.

### ***Variables***

Table 1 shows the means for the independent variables for the entire sample as well as separately by gender.

*Annualized Wage.* The distribution is reported for wage in dollars, as well as the natural log of wage. The logistic regressions will predict the natural log of wage in order to obtain more informative results.

*Demographic Characteristics.* Respondents' ages were included as a control to account for changes in the relationship between educational attainment and wage that have occurred in the last four decades. The respondents included in this analysis were between the ages of 23 and 65. The gender and race/ethnicity of respondents were also used as demographic controls since they tend to be strong predictors of both educational attainment and wage.

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<sup>1</sup> A detailed description of the data can be found at <http://www.nsf.gov/statistics/srvygrads/>.

*Parents' Education.* Respondents reported the highest level of education reached by both their mothers and their fathers. Levels of educational attainment included: less than high school, high school diploma or equivalent degree, some college, bachelor's degree, master's degree, doctoral degree, professional degree, unknown. Dichotomous variables were created that reflect the level of educational attainment for both the respondent's mother and father.

*Level of Degree.* The sample includes only people with bachelor's degrees or higher. Much of the education research dealing with the role of education in reproducing inequality compares those who have education to those who do not. Since this research zeros in on variation in the returns to education, it is necessary to compare groups of people who have obtained different levels of credentials. Four categories of degree level are used in the analysis: Bachelor's Degree, Master's Degree, Doctoral Degree, and Professional Degree.

*Degree Relevance.* This is a self-reported measure of the relevance of an individual's degree to their primary occupation. The variable was derived from the question: "To what extent was your work on your principal job...related to your highest degree?" and possible responses included *closely related*, *somewhat related*, and *not at all related*. While a self-report may not be a purely objective measurement, measuring degree relevance this way allows for a more nuanced assessment of one's education. It also enables the analysis to capture the relevance of an individual's training to their occupation, not just the relevance of the topic they studied. Additionally, it allows

researchers to make inferences even about general fields of study, which certainly impart knowledge to students but may not be nominally similar<sup>2</sup>.

Additionally, since the measure is somewhat subjective, we would expect there to be random measurement error across individuals but there would be validity in the measure on average. This random measurement error results in attenuation bias in the estimates. Thus, if a measure were available that was purely objective while still capturing the aforementioned nuance of the self-report, we would expect the estimated effects from that analysis to be even more robust than the effects reported here.

### ***Models***

This analysis utilizes a logistic regression using a number of socio-demographic, educational, and occupational variables and the logarithm of wage. The baseline model examines the effect of socio-demographic characteristics, including age, age<sup>2</sup>, gender, race, and parent's education, on wage. A second model then shows the effect of level of degree and degree relevance on wage. The third model incorporates field of education to ensure that the effects of degree relevance and degree level are not simply due to wage discrepancies between the different fields.

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<sup>2</sup> A study analyzing the effect of degree relevance on wage was conducted by Robst (2010) utilized this variable in the 2003 wave of the NSCG for the reasons similar to those outlined above.

## Empirical Results

The estimated coefficients for the regression models are presented in Table 2. In the first model we can see that parent's education has little effect on the coefficients for degree level and degree relevance. This is surprising given the explanatory power that these variables usually have when examining the relationship between educational attainment and adulthood socio-economic status. There are highly significant coefficients associated with gender and certain racial/ethnic groups, which supports the idea that education at all degree levels pays off differently for people of different races and genders. There are many compelling theories about why wage discrepancies exist between people of different races and genders but that issue is outside the scope of this paper.

The results of the second regression model suggest that, controlling for socio-demographic background, obtaining higher levels of post-secondary degrees do not pay off as much for individuals as possessing post-secondary degrees that are closely related to one's occupation. By taking the anti log  $(1 - e^B)$  of these coefficients we can translate a coefficient into the predicted wage increase associated with that variable. An individual with a Master's degree is predicted to make 5% more than an individual with a Bachelor's. An individual with a Doctoral degree is predicted to make 23% more than an individual with a Bachelor's degree. An individual with a Professional degree is predicted to make 70% more than an individual with a Bachelor's degree.

Turning now to the coefficients for degree relevance we can see that increases in the relevance of one's post-secondary degree are associated with greater wage increases than increases in the level of degree. Controlling for the level of the degree, an individual with a closely related degree is predicted to make 49% more than an individual with a degree that is not at all related to their occupation. An individual with a somewhat related degree is predicted to make 20% more than an individual with a Bachelor's degree. This means that the predicted wage difference between individuals with closely related degrees and individuals with degrees that are not at all relevant to their occupation is more than double the predicted wage difference between individuals with a Doctorate and individuals with Bachelor's degree. In fact, having a degree that is only somewhat related to one's field of occupation has nearly the same effect as having a Doctoral degree.

As we can see in model three, after incorporating field of education the coefficients associated with degree relevance have decreased and the coefficients associated with degree level have increased. In the saturated model, an individual with a Master's degree is predicted to make 9% more than an individual with a Bachelor's. An individual with a Doctoral degree is predicted to make 32% more than an individual with a Bachelor's degree. An individual with a Professional degree is predicted to make 86% more than an individual with a Bachelor's degree. Controlling for the level of the degree, an individual with a closely related degree is predicted to make 42% more than an individual with a degree that is not at all related to their occupation. An individual



with a somewhat related degree is predicted to make 15% more than an individual with a Bachelor's degree. While the differences between the effects of degree relevance and degree level on predicted wage have diminished, degree relevance still has an effect that is 10 percentage points greater than the effect of degree level.

## Discussion

The findings of this research suggest that, as expected, higher levels of post-secondary degrees are associated with increases in wages. Post-secondary degrees that are closely related to the individual's primary occupation, however, are associated with even greater increases in wages. While professional degrees have the greatest payoffs, the wage increases associated with having a post-secondary degree that is closely related to one's primary occupation, controlling for the level of the degree, are greater than those associated with obtaining PhDs and Master's degrees.

Professional degrees represent an exception to this theory since the high wages associated with that level of degree undoubtedly reflect the preponderance of the high paying jobs that require that type of degree. Those individuals with professional degrees go into fields that have legal barriers to entry. To be a doctor, for example, one must have completed medical school to be eligible for certification and subsequent employment. The high wages are thus a result of an occupational effect, not the effect of educational attainment per se. It is for this reason as well that Professional degrees should be treated as an exception to the theory in this analysis.

The differences in the coefficients in the second and third model are to be expected since field of education is closely tied to field of employment, and much of the variation in wages can be explained by field of employment. Additionally, the patterns of wage increases that are associated with higher levels of degrees or increasingly more relevant degrees will be unique within each field of employment. For example, an

individual with a degree in Visual Arts that is closely related to their job is likely to make less than an individual with a degree in Business that is only somewhat related to their job. Interestingly, however, the effect of degree relevance is greater than the effect of degree level even after controlling for field of degree. We would expect that since the field of an individual's degree is inextricably linked to their wage, the inclusion of field of education in the model would eliminate the differences between the wage increases associated with higher levels of degrees and the wage increases associated with highly relevant degrees.

If we think about these findings in terms of educational investments, this research suggests that it is more profitable to obtain a highly relevant degree, as opposed to only a high level of degree. While the impact of higher levels of education on wage outcomes is undeniable, the importance of the training and socializing effect of education should not be so heartily discounted. A more nuanced incorporation of both of these theories into the academic understanding of these educational processes would be most informative.

These findings are also useful in thinking about the returns to education outside of a theoretical understanding of educational processes. Much attention in academic research as well as the mainstream media has been paid to credential inflation – the aforementioned idea that students must obtain increasingly higher credentials to be competitive in their respective fields' labor markets. This research, however, would suggest that the competitiveness of a candidate for a job should be based on the

relevance of that person's degree to the job, not only the level of their degree. If we assume that people are generally paid in accordance with their productivity on the job (Becker, 1964), then we can view wages as a proxy for productivity. Therefore, since the wage increases associated with having education that is relevant to one's job are greater than those associated with obtaining higher levels of degrees, we can assume that those individuals with training that is relevant to their jobs are generally more productive than those with higher levels of degree that are unrelated to their job. Given this, when assessing the competitiveness of potential employees it may be misguided to overemphasize the possession of certain types of degree and undervalue other forms of specialized training.

While the impact of vocational training on an individual's productivity is outside the scope of this research, it does represent a specialized form of training which, according to the above assertion, is an important factor when assessing the competitiveness and potential productivity of a job candidate. A negative byproduct of credential inflation is that it unfairly privileges wealthier students. These students have increased access to social and financial resources, which enable them to obtain these credentials more easily than middle class or poor students. Vocational training represents a highly specialized form of education that is accessible to more people regardless of their financial resources. However, due to credential inflation, this type of education is not as highly valued in the labor market as is a traditional four year degree. If vocational training were more valued in certain sectors of the US labor market it could

increase the number of people that are eligible for the increasing number of high skill jobs without compromising productivity. Additionally, it could increase upward social mobility by removing some financial barriers for students who may lack those resources.

In addition to leveling the playing field for young students and workers, adapting the general view of the value of different kinds of education could be more broadly beneficial. Due to the fundamental shift in the US from a production driven economy to one driven by information and technology, an increasing number of jobs require post-secondary education. Accompanying this shift is a growing gap between the number of high skill jobs and the number of students earning the credentials required by those jobs (Carnevale et al., 2010). Researchers at the Georgetown University Center of Education and the Workforce predict that by 2018 to meet the demand for high skilled workers the country will need 22 million new college degree holders, but will only have produced 19 million. In creating a lack of highly educated young workers, the current system also creates a surplus of low skill workers who face increased competition for a shrinking number of low skill jobs. These patterns become particularly troubling when one considers the current levels of unemployment in the US.

Much attention has been paid to ways in which we can increase the number of college graduates in the US, namely lowering the cost of higher education. However, there is a solution that lies within the labor market that deserves exploration. If we assume that higher wages are associated with higher productivity, and we therefore view wages as a rough proxy for productivity or capability, we see that it is not only the

credential that is important during the hiring process, but the relevance of a prospective employee's training. If vocational degrees or other training that provides specific skill sets were valued more by potential employers, it could work towards closing the gap between the supply of and demand for high skill workers.

The findings of this research are generalized across all fields of occupation. While these aggregate level trends are important, it is likely that the educational processes outlined in Human Capital and Credentialing Theory operate to varying degrees in different fields of occupation. Thus, future research should examine variation in the returns to education associated with each of these processes across fields of occupation.

In closing, I want to reiterate that this study is not intended to resolve the classic and very complex debate between Human Capital Theory and Credentialing Theory. My aim is rather to provide further insight into the relationship between educational attainment and adulthood socio-economic status and highlight its complexity. A trend exists in education research and economics, as well as in American education, to view the credential as the focal point when it comes to labor market outcomes. I am not arguing that the credential is not important, in fact I provide evidence that there is a positive linear relationship between the level of the credential and wage. The findings of this study suggest, however, that focusing on only the credential in this way does not paint a complete portrait of the returns to education in the United States labor market. Operating under the assumption that education primarily serves to allocate people into

different places in social and occupational hierarchies, while paying little attention to the socializing force of education, can result in theories, interpretations, and practices that are incomplete or misguided. Having a degree that is highly relevant to one's occupation is associated with greater wage increases than is simply obtaining a high level of degree. These results suggest that the Human Capital Theory and Credentialing Theory are not mutually exclusive and that attention should be paid to both theories in order to make accurate claims about the role of education in the United States. If we are to fill the gap between the number of jobs requiring specialized training and the number of young people who are eligible to fill those positions the solution must be multifaceted and based on an accurate understanding of the educational processes which create our labor force.

## Tables

**Table 1. Descriptive Statistics for Study Variables, for Full Sample and by Gender**

	Full Sample		Males		Females	
	M	(SD)	M	(SD)	M	(SD)
Wage	64,721.46	36,029.50	73,943.31	36,602.65	51,464.40	30,664.40
LnWage	10.86	.78	11.04	.69	10.61	.82
Age	46.95	11.84	47.98	11.98	45.58	11.53
Age <sup>2</sup>	2344.34	1162.10	2445.22	1190.98	2210.68	1108.66
Bachelor's Degree	.54	.50	.53	.50	.54	.50
Master's Degree	.30	.46	.08	.27	.34	.47
Doctoral Degree	.09	.28	.11	.31	.06	.24
Professional Degree	.07	.25	.08	.27	.06	.47
Unrelated Degree						
Somewhat Related Degree	.47	.85	.50	.87	.42	.81
Closely Related Degree	.61	.49	.60	.49	.63	.48
<i>Father's Education</i>						
Less than H.S.	.19	.39	.20	.40	.18	.38
H.S. or equivalent	.26	.44	.27	.45	.25	.43
Some College	.16	.37	.15	.36	.17	.38
Bachelor's Degree	.20	.40	.20	.40	.20	.40
Master's Degree	.09	.29	.09	.28	.10	.29
Doctoral Degree	.04	.19	.04	.19	.04	.19
Professional Degree	.05	.22	.05	.22	.06	.23
Unknown	.01	.10	.01	.10	.01	.10
<i>Mother's Education</i>						
Less than H.S.	.18	.38	.38	.49	.16	.37
H.S. or equivalent	.36	.48	.38	.49	.33	.47
Some College	.20	.40	.18	.38	.22	.41
Bachelor's Degree	.17	.38	.17	.37	.18	.38
Master's Degree	.07	.26	.07	.25	.08	.27
Doctoral Degree	.01	.09	.01	.09	.01	.10
Professional Degree	.01	.10	.01	.10	.01	.11
Unknown	.01	.07	.01	.01	.004	.07
White Male	.42	.50				
White Female	.30	.45				
Black Male	.03	.18				
Black Female	.04	.20				
Hispanic Male	.04	.19				
Hispanic Female	.03	.18				
Asian Male	.07	.26				
Asian Female	.05	.21				
Other Male	.01	.11				
Other Female	.01	.11				



**Table 2. Estimates of OLS Regression of Log-Wage**

	<u>Model 1</u>	<u>Model 2</u>	<u>Model 3</u>
Age	.09***	.09***	.08***
Age <sup>2</sup>	-.0009658***	-.00095035***	.00088329***
Female	-.46***	.45***	-.35***
<i>Race</i>			
White ( <i>ref</i> )	---	---	---
Black	-.03**	-.03**	.02**
Hispanic	-.05***	-.08***	.07***
Asian	.10***	.06***	-.02**
Other	-.07***	-.06***	-.05**
<i>Father's Education</i>			
Less than H.S. ( <i>ref</i> )	---	---	---
H.S. or equivalent	.04***	.03***	.03**
Some College	.04***	.04***	.02**
Bachelor's Degree	.10***	.08***	.06***
Master's Degree	.09***	.06***	.05***
Doctoral Degree	.09	.03*	.02
Professional Degree	.17*	.05***	.05***
Unknown	-.02**	-.07**	-.06*
<i>Mother's Education</i>			
Less than H.S. ( <i>ref</i> )	---	---	---
H.S. or equivalent	.02**	.03	.03***
Some College	.02	.02	.03**
Bachelor's Degree	.04**	.03**	.03***
Master's Degree	.05***	.03**	.04***
Doctoral Degree	.04	.01	.004
Professional Degree	.05**	.002	-.14
Unknown	-.13**	.13**	.14**
<i>Level of Degree</i>			
Bachelor's Degree ( <i>ref</i> )		---	---
Master's Degree		.05***	.09***
Doctoral Degree		.21***	.28***
Professional Degree		.53***	.63***
<i>Degree Relevance</i>			
Unrelated Degree ( <i>ref</i> )		---	---
Somewhat Related Degree		.18***	.14***
Closely Related Degree		.41***	.35***
<i>Field of Education</i>			

Agricultural	-.22***
Architecture ( <i>ref.</i> )	---
Biological and Biomedical Sciences	.04*
Business, Management, and Marketing	.16***
Communication and Journalism	.60**
Computer and Information Sciences	.25***
Education	-.20***
Engineering	.25***
English and Foreign Languages	-.16***
Family and Consumer Sciences	-.28***
Health Professions	.05
History	-.01
International Relations and Affairs	.06
Law or Prelaw	-.13***
Liberal Arts or General Studies	.06
Library Science	-.16**
Mathematics and Statistics	.14***
Parks, Recreation, and Fitness Studies	-.24***
Philosophy, Religion, and Theology	-.37***
Physical Sciences	.05***
Production, Mechanic and Repair Technologies	.14***
Psychology	-.13***
Public Administration and Social Services	-.08**
Social Sciences	.02
Visual and Performing Arts	-.30***
Other	-.07

+  $p < 0.10$ . \*  $p < 0.05$ . \*\*  $p < 0.01$ . \*\*\*  $p < 0.001$

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