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**Racial Inequality in Expanded Measures of Educational
Attainment**

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INTRODUCTION

Well-documented racial and ethnic differences in educational attainment have persisted in the post-Brown vs. Board of Education era (Ryan and Siebens 2012; Everett et al. 2011). Research on this inequality is based entirely on traditional measures of educational attainment that effectively capture credentials that result in a degree, including high school diplomas, two- and four- year degrees, and advanced degrees. However, because alternatives to traditional degrees such as educational certificates and professional certifications and licenses also have labor market value and may provide opportunities for upward mobility, they warrant consideration when examining social and economic outcomes and racial inequality. Policy makers and researchers have begun to recognize the labor market value of alternative credentials, including credentials earned from short-term postsecondary education, and President Obama has called for all adults to obtain at least one year of postsecondary education. Until now, no available data sources captured the prevalence of these alternative credentials.

This paper analyzes new data from the Survey of Income and Program Participation's (SIPP) topical module on alternative credentials to examine racial and ethnic differences in alternative educational credentials, variation by level of traditional educational attainment, and the effect of this inequality on racial and ethnic inequality in labor market outcomes. This paper will be the first to document the size of racial and ethnic gaps in receipt of alternative educational credentials and will provide a more complete picture of inequality in educational attainment and its effect on inequality in labor market outcomes.

BACKGROUND

A large body of research has documented racial and ethnic inequality in school performance and ultimate educational attainment, although some of this research has focused on

black-white gaps (Ryan and Siebens 2012; Aud, Fox, and Kewal Ramini 2010). Racial and ethnic performance differences exist when young children enter school, and these disparities persist or widen overtime to result in inequality in educational attainment and occupational outcomes (Jencks and Phillips 1998; Aud, Fox, and Kewal Ramini 2010). Although the gap in high school graduation rates for whites and blacks has narrowed, gaps in college enrollment and graduation remain (Mare 1995; Ryan and Siebens 2012). An examination of inequality beyond black-white gaps suggests that the educational outcomes of Asian students are equal to or better than those of white students and that Hispanics have lower attainment levels than black students (Gamoran 2001).

However, these studies do not examine alternative credentials, which are growing in prevalence. For example, Ewert (2012) found an increase in vocational certificates among the adult population from 1984 to 2009. Short-term education is a possible way to lift some groups, including Hispanics and Blacks, with low levels of educational attainment into better economic standing. Recent economic challenges have pushed many American towards short-term education options, and this short-term education may pay off.

Time spent on education and training develops general human capital, or skills and competencies, which can increase productivity and returns in the labor market. Furthermore, sub-baccalaureate education can develop vocational skills that provide access to higher paying occupations (Grubb 1993), and even credentials resulting from short-term postsecondary education may provide an opportunity for upward economic mobility. In fact, some researchers believe that short-term postsecondary training will be an important factor in rebuilding a skilled middle class in the wake of recent labor market polarization (Autor and Dorn 2013). Ewert and Kominski (2014) found significant earnings advantages for people with professional

certifications, licenses, and educational certificates, including earnings premiums for these alternative credentials particularly at low levels of regular education (Ewert and Kominski 2014).

Some limited research suggests there are racial and ethnic differences in receipt of vocational certificates. For example, Carnevale et al. (2012) found that vocational certificates are more prevalent among blacks and possibly Hispanics than among whites and Asians. In the first analyses of the SIPP data on alternative credentials, Ewert and Kominski (2014) documented racial and ethnic differences in professional certifications, licenses, and educational certificates. To the extent that rates of receipt and returns to these credentials vary by racial and ethnic groups, alternative credentials may either increase or diminish racial and ethnic inequality. This paper uses data from the SIPP to examine the complex relationship between traditional educational attainment, alternative credentials, racial and ethnic inequality, and labor market outcomes.

DATA AND METHODS

This research uses data from the 2008 SIPP Panel, a nationally representative longitudinal survey of the U.S. that began in 2008 with follow-up interviews every four months thereafter. The SIPP data contain a rich amount of information on demographic characteristics, traditional educational attainment, and economic outcomes. The SIPP Wave 13 topical module on alternative credentials includes data on professional certifications, licenses, and educational certificates, as well as characteristics of these alternative credentials. These measures were developed by the federal Interagency Working Group on Expanded Measures of Enrollment and Attainment (GEMEnA), a group tasked with improving federal data collection on education,

credentials, and job training.¹ These or very similar questions will likely be part of a new effort on the part of the federal government to keep track of these credentials.

This paper will first enumerate the alternative educational credentials held by different racial and ethnic groups, documenting inequality in alternative credentials in general and by level of traditional educational attainment. I will also analyze the dichotomous measures of having a professional certification or license and having an educational certificate using logistic regression in order to examine race and ethnic differences, net of key demographic characteristics, and to more directly test for interactions. The paper will carefully show how merely focusing on racial and ethnic inequality in traditional educational attainment does not fully capture the magnitude of inequality in the U.S. educational system.

The paper will then show how alternative credentials, and combinations of credentials and traditional educational attainment, pay off in the labor market, and will also examine whether the payoffs vary by race and ethnicity. The analysis uses a linear regression model that logs monthly earnings to account for right skewness in the overall distribution of earnings. These parametric models provide the opportunity to examine interactions between alternative credentials and race and ethnicity to determine whether the effects of alternative credentials vary across groups. Supplemental analyses based on models run separately for different education levels will further explore whether alternative credentials pay off more for certain groups at particular education levels².

RESULTS

¹ For more information on the GEMEnA interagency working group, please visit the working group's website at: <http://nces.ed.gov/surveys/gemena/>.

² I use SAS procedures and replicate weights to calculate variances that accurately reflect the complex survey design.

Table 1 shows the well-documented racial and ethnic differences in traditional educational attainment.³ Non-Hispanic Asians were most likely to hold a bachelor's degree or higher, followed by non-Hispanic whites.⁴ While 31 percent of Asians held a bachelor's degree as their highest level of attainment and 18 percent held an advanced degree, 20 percent of non-Hispanic whites held a bachelor's degree and 12 percent an advanced degree. Blacks and Hispanics of any race were most concentrated at lower levels of educational attainment. Thirty nine percent of blacks and Hispanics reported high school completion as their highest level of traditional educational attainment, and 13 percent of blacks and 28 percent of Hispanics did not complete high school.⁵

These findings show stark racial and ethnic differences in traditional educational attainment in which Asians and whites have higher levels of educational attainment and blacks and Hispanics have lower levels of educational attainment. Since educational attainment is closely linked to labor market outcomes, particularly earnings, these racial and ethnic differences in educational attainment shape racial and ethnic inequality in economic outcomes. However, this picture is based entirely on a measure of educational attainment that results in a traditional degree. Alternative educational credentials, including professional certifications, licenses, and educational certificates, also develop skills that pay off in the labor market and must therefore be considered when examining racial and ethnic inequality in attainment and eventual economic outcomes.

³ The data are subject to error arising from a variety of sources. For information on sampling and nonsampling error see <http://www.census.gov/content/dam/Census/programs-surveys/sipp/tech-documentation/source-accuracy-statements/2008/SIPP%202008%20Panel%20Wave%2004%2020Core%20Source%20and%20Accuracy%20Statements.pdf>.

⁴ Race and Hispanic origin categories are mutually exclusive. Respondents who report multiple races are categorized as "other." To conserve space, in the remainder of the paper I refer to non-Hispanic whites, non-Hispanic blacks, and non-Hispanic Asians as simply whites, blacks, and Asians.

⁵ The percent of people with high school completion in the other race category did not differ from blacks and Hispanics, and the percent of people with less than high school in the other race category did not differ from blacks.

Table 2 shows that 25 percent of the adult population held at least one alternative credential, regardless of level of regular educational attainment. In 2012, 46.3 million adults aged 18 and over held a professional certification or license and 19.1 million held an educational certificate.⁶ In other words, 22 percent of adults held a professional certification or license, and 9 percent held an educational certificate.⁷ Professional certifications and licenses were more common among the population with an associate's degree or higher, and they are particularly concentrated at the master's and professional degree levels. In contrast, educational certificates were most prevalent at the associate's degree level. Adults with a high school degree or less were the least likely to hold any type of alternative credential.

RACE AND ETHNIC DIFFERENCES IN ALTERNATIVE CREDENTIALS

The prevalence of alternative credentials varies across race and ethnicity, just as it did across education levels, and there were significant differences by race and ethnicity (Table 3).⁸ Whites were more likely than other groups to hold professional certifications, licenses, and educational certificates, and Hispanics were least likely.⁹ While 85 percent of Hispanics did not hold an alternative credential, 78 percent of Asians, 79 percent of blacks, and 72 percent of whites reported the same.¹⁰ Twenty four percent of whites held professional certifications or licenses, compared with 13 percent of Hispanics. Although Asians and blacks held alternative

⁶ While total population estimates in tables represent the entire U.S. civilian noninstitutionalized population, nonresponse to the topical module and specific data items has not been accounted for with imputation. About 9% of respondents did not provide answers to the topical module, representing approximately 21 million persons. Thus, these estimates of alternative credentials are conservative numeric estimates, reflecting only those sample cases providing data.

⁷ It is important to remember that some people held both a professional certification or license and an educational certificate.

⁸ There were no significant differences between men and women in rates of no alternative credentials or professional certifications and licenses, but more women than men held educational certificates.

⁹ The percent of whites and Asians with educational certificates did not differ, and the percent of whites and people in the "other race" category with educational certificates did not differ either.

¹⁰ The difference in the percentage with no alternative credential is not significantly different between Asians and blacks.

credentials at similar rates, both groups were less likely than whites to hold professional certifications and licenses and blacks were less likely than whites to hold educational certificates. More native-born adults held alternative credentials than foreign-born adults.

Although Asians had the highest levels of traditional educational attainment, they were not the most likely to hold alternative credentials. Meanwhile, Hispanics had the lowest levels of educational attainment and were the least likely to hold alternative credentials.

Table 4 uses logistic regression models to examine racial and ethnic differences in the likelihood of holding alternative credentials, net of other key demographic characteristics including sex, education level, and nativity status. The table reports regression coefficients and so positive values indicate an increased likelihood of holding an alternative credential and negative coefficients indicate a decreased likelihood. Blacks, Asians, and Hispanics were all less likely than whites to hold a professional certification or license, after controlling for education level and nativity status. There were no racial and ethnic differences in educational certificates net of education level and nativity status.

Table 5 shows that attainment patterns are even less straightforward after taking into consideration level of educational attainment and alternative credentials. The patterns by nativity status found in Table 3 held across education levels, but the patterns by race and ethnicity varied. Among advanced degree holders, there were similar rates of professional certifications across racial and ethnic groups except for Asians, who had significantly lower rates than all other groups. About 48 to 49 percent of all other groups of advanced degree holders held professional certifications or licenses, compared to only 31 percent of Asians. At the advanced degree level, there were no racial or ethnic differences in educational certificates.

Among Bachelor's degree holders, 77 percent of Asians and 76 percent of Hispanics did not hold any alternative credentials, a higher rate than for Blacks and Whites. At this education level, Hispanics were less likely to hold educational certificates than blacks and whites.¹¹ For adults with some college but less than a bachelor's degree, whites were more likely than all other groups except Asians to hold a professional certification or license.¹² At this education level, differences in rates of educational certificates were not significant across race and ethnicity.¹³ For adults with a high school degree or less, whites were most likely to hold professional certifications, licenses, and educational certificates, and Hispanics were least likely.¹⁴ Blacks and Asians held these alternative credentials at similar rates, but both groups were less likely than whites to hold them.

Hispanics had particularly low rates of alternative credentials at most education levels, with the exception of advanced degrees.¹⁵ Although Asians had the highest levels of educational attainment, they were the least likely to hold any alternative credentials at the highest levels of educational attainment, and were less likely than whites to hold alternative credentials at other levels of educational attainment as well.¹⁶ While blacks generally had low levels of educational

¹¹ At the bachelor's degree level, the difference in the percent with an educational certificate did not differ for Asians and Hispanics.

¹² The difference between whites and Asians was not significant.

¹³ Among adults with some college but no degree, a greater percentage of whites than the other race category had educational certificates.

¹⁴ The differences between whites and people in the other race category were not significantly different. The differences between blacks and Asians were not significantly different. Differences in rates of professional certifications and educational certificates were not significantly different for Asians and Hispanics, blacks and the other race group, or Asians and the other race group.

¹⁵ The percent of Hispanics with no alternative credential did not differ from the percent of blacks, Asians, or other at the some college but less than Bachelor's degree level, Asians at the Bachelor's degree level, or whites and blacks at the advanced degree level. At the some college but no degree level, whites and Hispanics with educational certificates are not statistically significant. At the advanced degree levels, the percent with a professional certification or license for Asians and Hispanics is statistically significant. At the high school or less level, Asians and Hispanics are not statistically significant.

¹⁶ The percent of Asians and Hispanics with no alternative credential at the Bachelor's degree level and Asians and people of other race at the advanced degree level were not statistically significantly different.

attainment, they were as likely as Asians to hold alternative credentials¹⁷. These analyses clearly show that patterns of alternative credentials differ from patterns of traditional educational attainment across racial and ethnic groups.

Table 6 displays the logistic regression of having a professional certification or license separately by education level to examine in greater detail how racial and ethnic differences in holding professional certifications and licenses vary across education level, net of key demographic characteristics.¹⁸ For example, the first column shows how the covariates affect the likelihood of holding a professional certification or license for people with less than a high school degree. The top panel of Table 6 shows that Hispanics were less likely than whites to hold a professional certification or license across most education levels.¹⁹ Asians were less likely than whites to hold professional certifications or licenses at the highest education levels—a bachelor’s degree or higher. There were few significant differences between blacks and whites in the likelihood of holding a professional certification or license—the only difference was at the some college, no degree level. The coefficient on black was marginally significant at the “some college” level, which may mean some interactions are present. However, the lack of strong effects for blacks in these regressions indicates that the overall differences between blacks and whites from Table 4 were most likely due to the fact that blacks are disproportionately concentrated at low levels of education where people are less likely to hold an alternative credential.

The second panel of Table 6 includes interaction terms between sex and race and ethnicity to see whether racial differences depend on sex. At the high school level, the

¹⁷ At the advanced degree level, the percentage of blacks and Asians with a professional certification are statistically significantly different.

¹⁸ The table reports regression coefficients and so positive values indicate an increased likelihood of holding an alternative credential and negative coefficients indicate a decreased likelihood.

¹⁹ The differences between Hispanics and whites are not significant at the some college and advanced degree levels.

interaction between being male and black was marginally significant, suggesting that black men may be less likely to hold a professional certification or license than white men. At the some college but no degree level, the male and race interaction was negative for blacks and Asians, again suggesting that black and Asian males are particularly less likely to hold an alternative credential than their white male counterparts. At the bachelor's and higher levels, there were no significant interactions by sex for Asians, meaning the lower rate of holding a professional certification among Asians may work equally across sexes.

The significant interactions in the lower panel of table 6 suggest that racial and ethnic differences in alternative credentials are complex and possibly shaped by education level and sex. Future research with additional data would help shed light on these nuanced relationships.

ALTERNATIVE CREDENTIALS AND EARNINGS

The previous analyses showed racial and ethnic differences in alternative credentials, but are there also racial and ethnic differences in the labor market returns to these alternative credentials? In order to clearly understand racial and ethnic inequality in labor market outcomes such as earnings, it is useful to consider both traditional educational attainment and these alternative credentials alongside labor market value.

People working full-time with alternative credentials earned more than those without any alternative credentials, and people with professional certifications and licenses earned the most. The median monthly earnings for someone with a professional certification or license only was \$4,167 compared to \$3,433 for someone with an educational certificate only, \$3,920 for someone with both types of credentials, and \$3,110 for someone without any alternative credential (Ewert and Kominski 2014). Of course, factors such as education level, occupation, and industry also shape the relationship between earnings and alternative credentials.

Table 7 shows the results of the regression of log monthly earnings for full-time workers. The first model serves as a baseline, with strong effects for age, education, sex, foreign-born status and race on earnings. The second model shows a significant positive effect on earnings for professional certifications and licenses and no significant effect on earnings for educational certificates. The third model includes interactions between having a professional certification or license and race and ethnicity to explore whether the effects of professional certifications and licenses on earnings varies for different race and Hispanic origin groups. None of the interaction terms were significant, suggesting that professional certifications and licenses provide an earnings boost for all groups regardless of race and ethnicity.

Since the effect of alternative credentials on earnings may differ across education level, Table 8 shows the regression of log monthly earnings run separately by education level. For example, the first column shows the effect of the covariates on log monthly earnings for people with less than a high school degree. The positive effect of professional certifications and licenses on log monthly earnings was particularly concentrated at the high school, associate's and advanced degree levels. Although Table 7 did not show significant effects of educational certificates on earnings, Table 8 showed some significant effects for particular education levels. For people with high school degrees or less, there was a significant positive effect for educational certificates. For people with advanced degrees, educational certificates had a negative effect on earnings.

There were notable significant interactions between professional certifications and race and Hispanic origin at several education levels. Among people with associate's degrees and people with less than high school degrees, there was a mildly significant positive association with earnings for blacks who have a professional certification or license. That is to say, blacks

benefit more than whites from earning a professional certification or license at these education levels. Similarly, Hispanics appeared to get a bigger earnings boost than whites from a professional certification or license at the Bachelor's degree level.²⁰ Additional research is needed to corroborate and further explore the causes of these significant interactions. If some race and Hispanic origin groups benefit more than others from alternative credentials at particular education levels, then obtaining alternative credentials may help close the earnings gaps between groups.

DISCUSSION AND CONCLUSION

This study examines racial and ethnic differences in alternative credentials and possible relationships to earnings. We know from the existing body of social science research there exists dramatic racial and ethnic differences in traditional educational attainment, disparities in which Asians and whites have higher levels of educational attainment than blacks and Hispanics. This inequality in educational attainment is closely linked to racial and ethnic inequality in labor market outcomes. However, this type of approach only considers traditional measures of educational attainment, measures that only capture credentials that result in a degree, including high school diplomas, two- and four- year degrees, and advanced degrees. Alternative credentials, such as educational certificates and professional certifications and licenses, have labor market value and may provide opportunities for upward mobility, warranting consideration when examining social and economic outcomes and racial inequality.

This study is the first ever to examine racial and ethnic differences in alternative credentials, including professional certifications, licenses, and educational certificates. We find that Whites were more likely than other groups to hold professional certifications, licenses, and

²⁰ I also ran models separately by education and sex since both interact to affect earnings. The results suggest the need for additional analyses with more data to more fully capture how all the factors interact to affect earnings.

educational certificates, and Hispanics were least likely. Although Asians and Blacks held alternative credentials at similar rates overall, both groups were less likely than Whites to hold professional certifications and licenses and Blacks were less likely than Whites to hold educational certificates.

Patterns by race and ethnicity varied across education level. Hispanics had particularly low rates of alternative credentials at most levels except the advanced degree level. Although Asians had the highest levels of educational attainment, they were the least likely to hold alternative credentials at high levels of educational attainment, and were less likely than whites to hold alternative credentials at other levels of educational attainment. While blacks generally had low levels of educational attainment, they were as likely as Asians to hold alternative credentials at some education levels. Blacks' low rate of holding alternative credentials seems to be due in part to low education levels overall. Within education levels, only black males were sometimes significantly less likely than whites to hold alternative credentials. These differences in alternative credentials across race and ethnicity are notable since alternative credentials are associated with higher earnings. Across racial and ethnic groups, people generally earned more with a professional certification or license than with no alternative credential. Alternative credentials have an especially large payoff at some low levels of educational attainment. Consequently, for racial and ethnic groups with particularly low levels of educational attainment, alternative credentials may offer one avenue for skill development and increased labor market value.

Future examination of racial and ethnic inequality in educational attainment and labor market outcomes should incorporate alternative credentials in order to develop a more complete picture. Hispanics in particular seem to have low levels of traditional education along with a low

propensity to obtain alternative credentials. Blacks are less often less likely than Hispanics to be without alternative credentials, at least after accounting for level of traditional education.

However, the evidence here indicates that black males in particular may be less likely to hold these credentials. Given their history of exclusion from some types of skilled blue collar work, black males' access to and use of alternative credentials might be an area worthy of additional exploration. Researchers, policy analysts, and the general public concerned with low levels of educational attainment and earnings of blacks and Hispanics should carefully consider the potential role of alternative credentials in boosting earnings and reducing racial and ethnic inequality.

These data are the first to examine professional certifications, licenses, and educational certificates, but represent just some avenues of skill development beyond the traditional academic degree spectrum. Further work by the GEMEnA group on apprenticeships, on the job training, and non-credit courses will provide an even more complete picture of the attainment and skills of the U.S. population, and the inequality that lies therein.

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Table 1. Educational Attainment by Race and Ethnicity
Population Aged 18 and Older: 2012
(weighted)

Regular education level	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Asian	Non-Hispanic Other	Hispanic
Less than high school	6.8	12.7	8.4	11.9	27.7
High school completion	32.6	38.6	22.5	36.2	38.6
Some college	19.7	23.2	13.5	24.5	16.1
Associate's degree	9.0	7.9	6.9	8.1	6.0
Bachelor's degree	20.4	11.7	30.5	13.4	8.6
Master's degree	8.5	4.6	12.0	4.1	2.3
Professional degree	1.7	0.7	2.9	1.2	0.5
Doctorate degree	1.3	0.7	3.3	0.7	0.3

Note: Nonrespondents are not included in estimates of alternative credentials. Race categories are mutually exclusive. Respondents who report multiple races are categorized as "other."

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

Table 2. Percent with Alternative Credentials by Regular Educational Attainment
 Population Aged 18 and Older: 2012
 (weighted, numbers in thousands)

	No alternative credential		Professional certification, license		Educational certificate	
	Number	Percent	Number	Percent	Number	Percent
Total	161,557	75.2	46,326	21.6	19,113	8.9
Regular education level						
Less than High School	22,240	93.6	1,315	5.5	411	1.7
High school completion	59,056	83.1	9,891	13.9	4,482	6.4
Some college	32,134	76.5	8,064	19.3	4,243	10.2
Associate's degree	11,457	63.8	5,409	30.2	3,059	17.1
Bachelor's degree	26,196	67.3	11,447	29.5	4,027	10.4
Master's degree	8,291	52.5	7,018	44.6	2,180	13.9
Professional degree	1,015	31.6	2,178	67.7	436	13.7
Doctorate degree	1,531	58.8	1,004	38.7	274	10.6

Note: Nonrespondents are not included in estimates of alternative credentials.

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

Table 3. Percent with Alternative Credentials by Select Characteristics
 Population Aged 18 and Older: 2012
 (weighted, numbers in thousands)

	Total	No alternative credential	Professional certification, license	Educational certificate
Total	235,455	75.2	21.6	8.9
Race and Hispanic Origin				
Non-Hispanic white	155,530	72.1	24.3	9.7
Non-Hispanic black	27,165	78.7	18.3	8.3
Non-Hispanic Asian	10,448	78.1	19.6	8.8
Non-Hispanic other race	7,231	77.6	19.0	9.2
Hispanic (of any race)	35,080	85.3	12.7	5.7
Nativity				
Native born	198,609	73.7	22.8	9.5
Foreign born	36,846	83.5	14.9	5.9

Note: Nonrespondents are not included in estimates of alternative credentials. Race categories are mutually exclusive. Respondents who report multiple races are categorized as "other."

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

Table 4. Logistic Regression of Holding An Alternative Credential
Population aged 18 and older: 2012

	Professional certification or license	Educational certificate
Race and Hispanic Origin		
White, non-Hispanic	REF	REF
Black, non-Hispanic	-0.171 *	-0.033
Asian, non-Hispanic	-0.277 *	0.112
Other race, non-Hispanic	-0.116	0.092
Hispanic	-0.288 *	-0.089
Male	0.026	-0.136 *
Age	0.114 *	0.075 *
Age squared	-0.001 *	-0.001 *
Regular education level		
Less than high school	-1.206 *	-1.745 *
High school completion	-0.372 *	-0.517 *
Some college, no degree	REF	REF
Associate's degree	0.494 *	0.519 *
Bachelor's degree	0.476 *	-0.041
Advanced degree	1.235 *	0.215 *
Foreign born	-0.355 *	-0.372 *
Intercept	-3.728 *	-3.785 *

Note: *p < .05, +P < .10

REF=reference category

Note: Nonrespondents are not included in estimates of alternative credentials. Race categories are mutually exclusive. Respondents who report multiple races are categorized as "other." The table reports the regression coefficients.

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

Table 5. Percent with Alternative Credentials by Educational Attainment and Select Characteristics
Population Aged 18 and Older: 2012
(weighted)

	High school or less			Some college, less than Bachelor's			Bachelor's degree			Advanced degree		
	No alternative credential	Professional certification, license	Educational certificate	No alternative credential	Professional certification, license	Educational certificate	No alternative credential	Professional certification, license	Educational certificate	No alternative credential	Professional certification, license	Educational certificate
Race and Hispanic Origin												
Non-Hispanic white	83.3	13.7	6.2	71.3	23.7	12.5	65.9	31.0	10.5	48.3	49.2	13.4
Non-Hispanic black	87.6	10.6	4.5	74.7	20.6	11.9	66.4	29.8	11.7	51.3	46.8	14.6
Non-Hispanic Asian	88.5	9.5	4.0	75.1	22.1	12.4	76.8	20.9	9.0	66.6	31.1	12.2
Non-Hispanic other race	84.8	12.2	5.7	76.5	20.3	10.1	64.2	30.2	16.2	56.8	39.9	15.8
Hispanic (of any race)	91.1	7.7	3.1	77.1	18.5	11.7	75.9	22.7	7.2	49.0	47.6	14.9
Nativity												
Native born	84.4	12.8	5.9	72.1	22.9	12.4	66.1	30.7	10.6	47.8	49.7	13.9
Foreign born	91.1	7.8	2.4	78.0	19.1	10.8	75.1	22.8	9.2	64.0	33.9	11.1

Note: Nonrespondents are not included in estimates of alternative credentials. Alternative credentials are not mutually exclusive, so respondents can report both types of credentials and thus represented in both columns. Race categories are mutually exclusive. Respondents who report multiple races are categorized as "other."

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

Table 6. Logistic Regression of Holding Professional Certification or License, by Education Level
Population aged 18 and older: 2012

	Less than high school	High school completion	Some college, no degree	Associate's degree	Bachelor's degree	Advanced degree
Intercept	-5.729 *	-4.678 *	-4.222 *	-2.251 *	-3.092 *	-1.5104 *
Male	0.631 *	0.461 *	0.125 +	-0.203 *	-0.287 *	-0.3326 *
Age	0.137 *	0.136 *	0.133 *	0.087 *	0.107 *	0.0742 *
Age squared	-0.001 *	-0.001 *	-0.001 *	-0.001 *	-0.001 *	-0.00074 *
Race and Hispanic origin						
White, non-Hispanic	REF	REF	REF	REF	REF	REF
Black, non-Hispanic	-0.278	-0.274	-0.206 +	-0.077	-0.062	-0.1238
Asian, non-Hispanic	-0.175	-0.092	-0.114	0.389 +	-0.398 *	-0.4075 *
Other race, non-Hispanic	-0.420	-0.034	-0.088	-0.312	-0.055	-0.3236
Hispanic	-0.420 +	-0.414 *	-0.155	-0.376 *	-0.353 *	0.0386
Foreign born	-0.426 +	-0.306 *	-0.248 +	-0.361 *	-0.281 *	-0.5289 *
With Interactions						
Intercept	-5.690 *	-4.702 *	-4.259 *	-2.224 *	-3.106 *	-1.4694 *
Male	0.548 *	0.506 *	0.194 *	-0.253 *	-0.250 *	-0.3628 *
Age	0.138 *	0.136 *	0.133 *	0.087 *	0.107 *	0.0733 *
Age squared	-0.001 *	-0.001 *	-0.001 *	-0.001 *	-0.001 *	-0.00073 *
Race and Hispanic origin						
White, non-Hispanic	REF	REF	REF	REF	REF	REF
Black, non-Hispanic	0.000	-0.126	-0.003	-0.208	0.070	-0.2265
Asian, non-Hispanic	-0.428	0.056	0.312	0.311	-0.382 *	-0.4542 *
Other race, non-Hispanic	-0.606	-0.116	-0.375 +	-0.109	-0.061	-0.5345
Hispanic	-0.725 *	-0.361 *	-0.136	-0.461 *	-0.272	0.0782
Foreign born	-0.437 +	-0.308 *	-0.247 *	-0.384 *	-0.277 *	-0.5371 *
Male*black	-0.5581	-0.2621 +	-0.4845 *	0.377	-0.3183	0.2812
Male*Asian	0.4372	-0.2803	-1.0676 *	0.2195	-0.0396	0.0994
Male* other race	0.2951	0.1354	0.5198 +	-0.5308	0.0239	0.5266
Male*Hispanic	0.4619	-0.0869	-0.0387	0.2184	-0.1938	-0.0805

Note: *p < .05, +P < .10

REF=reference category

Note: Nonrespondents are not included in estimates of alternative credentials. Race categories are mutually exclusive.

Respondents who report multiple races are categorized as "other." The table reports logistic regression coefficients.

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

Table 7. Regression of Log Monthly Earnings
Population aged 18 and older with full-time employment: 2012

	Model 1	Model 2	Model 3
Intercept	6.395 *	6.392 *	6.396 *
Male	0.259 *	0.260 *	0.260 *
Age	0.067 *	0.066 *	0.066 *
Age squared	-0.001 *	-0.001 *	-0.001 *
Race and Hispanic origin			
White, non-Hispanic	REF	REF	REF
Black, non-Hispanic	-0.167 *	-0.165 *	-0.168 *
Asian, non-Hispanic	0.044	0.048	0.038
Other race, non-Hispanic	-0.081 *	-0.079 *	-0.083 *
Hispanic	-0.128 *	-0.123 *	-0.140 *
Education			
Less than high school	-0.354 *	-0.348 *	-0.344 *
High school completion	-0.159 *	-0.157 *	-0.156 *
Some college, no degree	REF	REF	REF
Associate's degree	0.092 *	0.086 *	0.086 *
Bachelor's degree	0.344 *	0.339 *	0.340 *
Advanced degree	0.630 *	0.611 *	0.612 *
Foreign born	-0.099 *	-0.095 *	-0.092 *
Alternative credentials			
Professional certification		0.079 *	0.068 *
Educational certificate		-0.018	-0.019
Procert*black			0.008
Procert*Asian			0.028
Procert*other race			0.009
Procert*Hispanic			0.078

Note: *p < .05, +P < .10

REF=reference category

Note: Only people employed full-time with positive earnings are included in these analyses. Nonrespondents are not included in estimates of alternative credentials. Race categories are mutually exclusive. Respondents who report multiple races are categorized as "other."

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

Table 8. Regression of Log Monthly Earnings, By Education Level
Population aged 18 and older with full-time employment: 2012

	Less than high school	High school completion	Some college, no degree	Associate's degree	Bachelor's degree	Advanced degree
Intercept	6.947 *	6.376 *	6.246 *	6.296 *	6.541 *	6.798 *
Male	0.221 *	0.239 *	0.273 *	0.281 *	0.254 *	0.266 *
Age	0.027 *	0.060 *	0.073 *	0.071 *	0.077 *	0.074 *
Age squared	0.000 *	-0.001 *	-0.001 *	-0.001 *	-0.001 *	-0.001 *
Race and Hispanic origin						
White, non-Hispanic	REF	REF	REF	REF	REF	REF
Black, non-Hispanic	-0.289 *	-0.170 *	-0.206 *	-0.171 *	-0.078	-0.118
Asian, non-Hispanic	-0.172	-0.005	-0.064	-0.147	-0.002	0.246 *
Other race, non-Hispanic	-0.215	-0.100	-0.080	-0.103	-0.068	-0.023
Hispanic	-0.102 +	-0.126 *	-0.151 *	-0.081	-0.228 *	-0.079
Foreign born	-0.076	-0.125 *	-0.139 *	0.035	-0.066	-0.075
Alternative credentials						
Professional certification	0.129	0.119 *	0.035	0.079 +	0.040	0.096 *
Educational certificate	0.380 *	0.086 *	-0.033	-0.024	-0.033	-0.153 *
Procert*black	0.251 +	-0.092	0.020	0.168 +	-0.108	-0.041
Procert*Asian	0.155	-0.045	0.150	0.183	-0.001	-0.040
Procert*other race	0.922	0.121	-0.069	0.041	-0.078	-0.055
Procert*Hispanic	0.046	-0.034	0.124	0.168	0.205 *	-0.060

Note: *p < .05, +P < .10

REF=reference category

Note: Only people employed full-time with positive earnings are included in these analyses. Nonrespondents are not included in estimates of alternative credentials. Race categories are mutually exclusive. Respondents who report multiple races are categorized as "other."

Source: U.S. Census Bureau, Survey of Income and Program Participation, 2008 panel, wave 13.

