

Conformity and Soft Skills as Determinants of Alternatively Credentialed Non-College Graduate Hireability

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Abstract

Despite targeting technical skills, vocational school graduates earn less than college graduates. This paper presents evidence that conformity selection and perceived skill gaps explain differences in hireability. Microdata from the United States reveal a perceived soft skill deficit for alternatively credentialed non-college graduate (ACNG) labor. Conformity is also important, but the direction of effect is heterogeneous by employer type. Conformity and perceived skill gaps explain about one-third of hireability variance. Perceived soft skill gaps explain more hireability variance than widely recognized factors like the industry of occupation. Opposite conventional explanation, results suggest that conformity reduces hireability on average. Respondents tend to perceive ACNG candidates as an even mix of high and low performers. Evidence favors employer risk aversion toward labor productivity as a preferred explanation of low ACNG demand. The conclusion incorporates discussion of public misperception on vocational school costs and suggests activities to reduce unconscious bias.

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1. Introduction

A substantial gap exists between the skills expected by employers and those possessed by college graduates[1, 2, 3, 4]. Experts view college alternatives, including vocational school, to be useful for technical training, but the traditional college degree retains a wage premium over vocational education. Unemployment, underemployment, and other adverse labor outcomes follow a similar pattern[5]. This paper seeks to resolve the apparent discrepancy between these outcomes while preserving the mainline economic view that employers pay for perceived job candidate skill. To explain the apparent discrepancy, this paper tests the hypothesis that employers expect an offsetting non-technical skill deficit when considering an alternatively credentialed non-college graduate (ACNG). I find evidence that employers and the general population in the United States expect a low level of soft skills from ACNG job candidates.

Alternative credentials refer to credentials other than the undergraduate degree[6]. The category includes, for example, industry certifications, portfolios of work, digital badges, and other records of unaccredited learning and achievement. Individuals typically obtain alternative credentials to improve employability. That is, they typically have the same goals as a college student. Many individuals obtain alternative credentials as a supplement to the college degree. Such a situation is Pareto-superior to degree attainment alone and is therefore intentionally excluded from the analysis. This paper focuses on the comparatively interesting case of alternative credentials as a substitute for the college degree. This research is valuable as a diagnostic tool at the skill level. If specific skills explain labor outcome differences, alternative learning providers can improve their products to reduce the outcome gap.

The signaling model has become one of the two standard explanations of the value of the college degree. Signaling theory provides three advantages over human capital theory for the present study. First, signaling theory can explain labor outcome variance when human capital is held constant.

Second, the signaling model empowers a questionnaire research design. In an

idealized human capital model, the measures of human capital would correspond to production process inputs. To establish a wide array of such skill measures would be complicated and prone to measurement sensitivities, assumptions, and errors of various kinds. In this framework, a questionnaire is a second-best
35 design that provides a proxy for the functional measure of skill.

Signaling theory takes the reverse approach. According to the signaling model, employer perception of candidate quality critically determines willingness to pay. The manner in which employer perception relates to candidate productivity, if at all, is secondary. In this framework, a questionnaire is an
40 ideal measurement tool. An additional benefit of using a questionnaire is the ability to ask hypothetical questions. Real job candidates might vary systematically in ways not observed by an analyst, but hypothetical questions preclude this issue.

Third, signaling theorists have laid out a testable hypothesis for weak labor
45 outcomes among non-college graduates. Following this model, scholars claim that the college degree signals intelligence, conscientiousness, and conformity[7]. In contrast, alternative credentials are hypothesized to signal nonconformity and low conscientiousness.

Research indicates that employer demand for conscientiousness and conformity follows a bliss point pattern. Excess individual conscientiousness can disturb team performance[8]. Conformity can lead to a lack of innovation and sub-optimal organizational practices[9]. Conformity selection occurs in part through heuristic decisionmaking, or unconscious bias.

Risk aversion is a distinct explanation for conformity selection. Some employers are not able to evaluate an alternative credential with confidence. Such
55 an employer views ACNG labor as a gamble with some odds of positive or negative outlier value. The employer may not prefer to hire such a candidate due to risk aversion, even if their point estimate for ACNG labor value is higher than their point estimate for a recent college graduate. If firm size effects are positively associated with ACNG hireability, this will add weight to an explanation
60 based on risk aversion.

2. Data and Methodology

A simple model of demand for labor provides context for the hypothesis of interest. This model is clarified in Equations 1a and 1b:

$$S_j = f(H_j) \tag{1a}$$

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$$w_{ij} = E_i(MRP_j) = f_i(S_j) \tag{1b}$$

Job candidate j , generates a signal of productivity, S_j from unobserved human capital, H_j . Employer i , forms an expectation of the marginal revenue product of j on the basis of $f_i(S_j)$, an employer-specific evaluation of S_j . A specific employer is willing to pay a specific job candidate wages of w_{ij} .

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This study uses ordinary least squares (OLS) regression analysis to estimate the effect of perceived skill gaps on hireability. An employer is willing to pay more for a relatively hireable individual. The representation of willingness to pay makes hireability a proxy of demand for labor and w_{ij} . This paper hypothesizes that employers preferentially value soft skills in the course of $f_i(S_j)$ to explain the reduced willingness to pay for ACNG labor relative to college graduate labor. If employers do bias toward soft skills in job candidate evaluation, one or more soft skill gap factors should yield a negative coefficient in a regression on hireability.

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This paper leverages an original set of online questionnaire responses ($n =$ 322). Responses are cross-sectional data obtained in early February of 2021. Respondents are United States citizens at or over the age of eighteen. Qualified respondents participated in the survey through the Amazon Mechanical Turk platform.

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The survey includes 65 questions in two sections¹. The first section captures respondent characteristics, and the second section captures a skill-level evaluation of various hypothetical job candidates. These questions can be grouped

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¹See Appendix A for a full copy of the survey.

into three groups of variables. There is the dependent variable of interest, a set of independent variables of interest, and some categorical controls.

In this study, the categorical variables and the control variables are the
90 same set. The independent and dependent variables of interest are Likert-type responses on a 10-point scale². Higher Likert-type values indicate greater agreement with some statement. Categorical controls include state of residence, the industry of occupation, employer status, firm size, and a measure called duration.

95 Duration measures the length of time the respondent believes it takes to obtain an alternative credential. Employer status describes whether an individual makes hiring and firing decisions in the course of their employment. The variable takes one of three values: yes, no, or unemployed. Employer effects refer to the case where an individual states that they do make hiring and firing
100 decisions. State of residence refers to a state within the United States or the District of Columbia.

The dependent variable of interest is called hireability. Hireability measures agreement that, “For many professions, alternative credentials can qualify a person for an entry-level position.” The dependent variables of interest include
105 perceived skill gaps and rulebreaker effects.

Rulebreaker effects refer to a collection of three factors that measure respondent agreement with statements about nonconformists, or “People who are willing to break formal or informal rules and norms.” The first statement indicates that nonconformists present a risk to a company’s reputation, productivity, or value. This statement received the least agreement and greatest
110 response variance among three qualitatively different descriptions of noncon-

²It is an accepted practice to treat Likert-type responses as either categorical or continuous for regression analysis. Jaccard and Wan provide support for continuous analysis of Likert-type data. They note that severe departures from the assumptions on cardinality “do not seem to affect Type I and Type II errors dramatically,” particularly when the Likert scale is five or more points[10]. This paper uses a 10-point scale and treats these data as continuous.

formists ($\mu = 6.29, \sigma = 2.51$).

The second statement indicates that nonconformists are held back by rules and “could just as easily be high performers as low performers.” This statement
115 received the most agreement and least variance among rulebreaker statements ($\mu = 6.93, \sigma = 2.10$). The agreement with this statement provides evidence against the thesis that employers value conformity for its own sake. In turn, this adds weight to the theory that employers value conformity as a risk aversion tactic while knowing that nonconformity signals positive outlier potential. The
120 third rulebreaker effect states that rulebreakers are creative, innovative, and likely to benefit company culture ($\mu = 6.71, \sigma = 2.18$).

Rulebreaker effects and perceived skill gaps are structurally linked. One of the skills that respondents evaluate is nonconformity, or “willingness to break formal or informal rules and norms.” Interpreting rulebreaker effects jointly
125 with the conformity gap effect enables better explanatory power and diagnostic utility.

Perceived skill questions in the second section of the survey allow for two ways to calculate perceived skill gaps. Perceived skill gaps are measured separately with and without overqualification effects. Overqualification effects are
130 important in external research[11, 12], but skill gap analysis that ignores these effects is also routine[13].

Perceived skill is a Likert-type response reporting agreement with the statement that a particular candidate has a particular skill. For each of 13 skills, the respondent imagines and reports skill levels for the ideal candidate, the average
135 actual employee, the average recent college graduate, and the average ACNG. As a result, 52 of the 65 questions in the survey are questions on perceived skill about kind of candidate.

The raw skill gap for some kind of candidate is the difference between the perceived skill for that candidate and the ideal candidate. The perceived skill
140 gap with overqualification effects equals the raw perceived skill gap. The perceived skill gap without overqualification is zero if the raw skill gap is negative, and otherwise it is equal to the raw skill gap.

The concept of skill is intentionally treated loosely in this analysis. The thirteen factors treated as skills include attractiveness, verbal, written, and
145 body language communication skills, conscientiousness, customer service skill, emotional intelligence (EQ), expected salary, teamwork, technical skill, willingness to break formal or informal rules (nonconformity), willingness to work odd hours, and willingness to commute.

Results focus on ACNG skill gap coefficients, and also comparative skill
150 gaps between ACNG labor and recent college graduates. Perceived ACNG skill gaps are also called absolute skill gaps. Subtracting the perceived recent college graduate skill gap from the absolute skill gap yields the comparative skill gap.

Models of these variables will support the hypothesis if soft skills are more important than technical skill gaps. Significant rulebreaker effects would provide
155 evidence that conformity is not valued by employers per se. A positive relationship between firm size and hireability would support an explanation from risk aversion.

3. Results

The median hireability response was eight out of ten. The mean response is
160 about 7.42. Absolute skill gaps and comparative skills gaps are both important explanations of hireability. Soft skills explain hireability better than technical skill does in both absolute and comparative terms. Technical skill is not a contributing factor in any model of interest. Of the thirteen skills investigated, seven skills contribute to the preferred model.

165 Table 1 reports five interesting multiple regressions. Models 1 through 4 are constructed to maximize adjusted r-squared. Factors in these models are not constrained using a p-value threshold. Model 4 is the preferred model, and factors in this model have a p-value less than 0.28. Model 5 is a special case designed to answer an analytical question.

170 Models 1 and 2 maximizes adjusted r-squared using absolute skill gaps. Model 1 includes overqualification effects and Model 2 excludes these effects.

This model is useful to demonstrate which skills are important determinants of ACNG hireability. The key result from these two models is that measuring skill gaps without overqualification is preferred.

175 Models 3 through 5 also exclude overqualification effects. Model 3 maximizes adjusted r-squared using comparative skill gaps. This model is useful for understanding which skills give a hireability advantage to ACNG labor over new college graduates. Model 4 synthesizes comparative and absolute skill gaps.

Table 1: Linear Models of Hireability

	1	2	3	4	5
Comparative, Attractiveness	-0.161***		-0.185*		
Comparative, Conscientiousness			-0.140		
Comparative, Customer Service			0.138	0.142*	0.145*
Comparative, EQ			-0.0955		
Comparative, Odd Hours			-0.177*	-0.255***	-0.260***
Comparative, Teamwork			-0.196*	-0.242**	-0.251**
Comparative, Writing			0.128	0.0920	0.0934
Comparative, Rulebreaker					0.0182
Duration	0.666**	0.634**	0.811***	0.744**	0.719**
Duration ²	-0.0884**	-0.0857**	-0.113***	-0.103**	-0.1000**
Employees 1-10					-0.187
Employees 11-50					0.398
Employees 51-200	-0.475*	-0.480**	-0.364	-0.459*	-0.258
Employees 201-500					0.135
Employees 501-1,000					0.420
Employees 1,001-5,000					0.0812
Employees 5,001-10,000					0.0789
Employees 10,000+					0.279
Gap, Attractiveness		-0.367***		-0.350***	-0.358***
Gap, Body Language-IT	0.100	0.132		0.106	0.0874
Gap, Conscientiousness	-0.0657	-0.0845		-0.132**	-0.134**
Gap, EQ	-0.0966	-0.0952			
Gap, Nonconformity					0.0574
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Table 1 – Continued

	1	2	3	4	5
Industry Credentials Required	0.706*	0.722**	0.374	0.378	0.375
Industry Credentials Normal	0.932**	0.926**	0.487*	0.436*	0.448*
Industry Credentials Sometimes	0.467	0.475			
Industry Credentials Unknown	0.641*	0.684**			
Industry, Agriculture	1.368	1.619*			
Industry, Energy	-1.277*	-1.190*	-1.200*	-1.442**	-1.448**
Industry, Finance	-0.811***	-0.783***	-0.712***	-0.715***	-0.717***
Industry, Information Technology	0.335	0.264	0.438*	0.306	0.337
Industry, Law	-1.813***	-1.670**	-1.935***	-1.876***	-1.857***
Industry, Transportation	1.512*	1.643**	1.216	1.403*	1.350*
Is Employed Non-Manager	-0.336	-0.383*	-0.497**	-0.471**	-0.451**
Is STEM Worker	-0.491**	-0.529**	-0.525**	-0.557**	-0.564**
Rule Breakers Risky	0.0732*	0.0715*	0.0880**	0.0747*	0.0762*
Rule Breakers Rockstars	0.133**	0.128**	0.147**	0.141**	0.140**
Rule Breakers Culture Add	0.0905	0.0974*	0.115**	0.112**	0.110**
State, Arizona	-1.157**	-1.048**	-0.755	-0.823*	-0.790
State, Arkansas	-2.690***	-2.817***	-2.489***	-2.664***	-2.770***
State, California	-0.575*	-0.570**	-0.488*	-0.435	-0.446
State, Colorado	-1.446**	-1.423**	-1.463**	-1.521***	-1.508***
State, Connecticut	-1.401	-1.550			
State, Florida	-0.444	-0.454			
State, Hawaii	-3.232***	-3.271***	-2.884***	-2.869***	-2.812***
State, Illinois	-0.637	-0.699*	-0.596	-0.675*	-0.698*
State, Kansas	-3.283**	-3.486**	-2.923*	-3.116**	-3.101*
State, Kentucky	-3.143***	-3.167***	-2.583***	-2.729***	-2.679***
State, Louisiana	-1.455*	-1.255*	-0.915	-0.941	-0.898
State, Maryland	-0.596	-0.642			
State, Nebraska	-2.037*	-2.167*	-1.391	-1.655	-1.596
State, Nevada	-1.406	-1.470	-1.465	-1.434	-1.409
State, New Jersey	-1.145	-1.139	-0.976	-0.936	-0.963
State, New York	-0.692**	-0.640*	-0.617*	-0.595*	-0.590*
State, Ohio	-3.943***	-4.024***	-4.051***	-3.808***	-3.761***
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Table 1 – Continued

	1	2	3	4	5
State, Pennsylvania	-0.752	-0.687	-0.608	-0.534	-0.539
State, South Carolina	-1.183	-1.243	-1.361	-1.310	-1.347
State, Tennessee	-1.878**	-1.909**	-1.545*	-1.843**	-1.799**
State, Texas	-0.906**	-0.851**	-0.797**	-0.790**	-0.789**
State, Washington	-0.817	-0.863*	-0.880*	-0.996**	-1.003**
Constant	5.036***	5.356***	4.755***	5.327***	5.343***
Adjusted R-sqr	0.2181	0.2512	0.2331	0.2784	0.2654
R-sqr	0.3253	0.3539	0.3310	0.3706	0.3799
p(F)	0.0000	0.0000	0.0000	0.0000	0.0000
* $p < 0.10$, ** $p < 0.05$, *** $p < .01$					

180 Rulebreaker effects are significant in all models, but the conformity skill is in-
 significant when rulebreaker effects are included. This is intuitive, because these
 factors are essentially explaining the same thing. Rulebreaker effects describe
 the way a respondent views conformity in a qualitative way. Excluding overqual-
 ification, a conformity skill gap indicates that a respondent views ACNG labor
 185 as less conformist than ideal. The degree to which a candidate is less conformist
 than ideal is almost fully implied in rulebreaker effects. This implication is sub-
 stantial but imperfect. Because the implication is substantial, a conformity skill
 gap does not improve adjusted r-squared. Because the implication is imperfect,
 there is an opportunity to force the conformity skill gap into the model. While
 190 the p-value will be unacceptably high, it is still analytically interesting to obtain
 the sign of the conformity skill gap in this way. This is what Model 5 does.

Model 5 takes Model 4 and adds additional factors for employer size, the
 absolute skill gap for conformity, and the comparative gap for conformity. These
 coefficients are not estimated with confidence, but their signs add marginally
 195 to the cumulative evidence for conclusions. Rulebreaker effects are robustly
 positive and significant in all models. Positive rulebreaker effects indicate that
 nonconformity is positive on hireability. This result is reinforced by positive

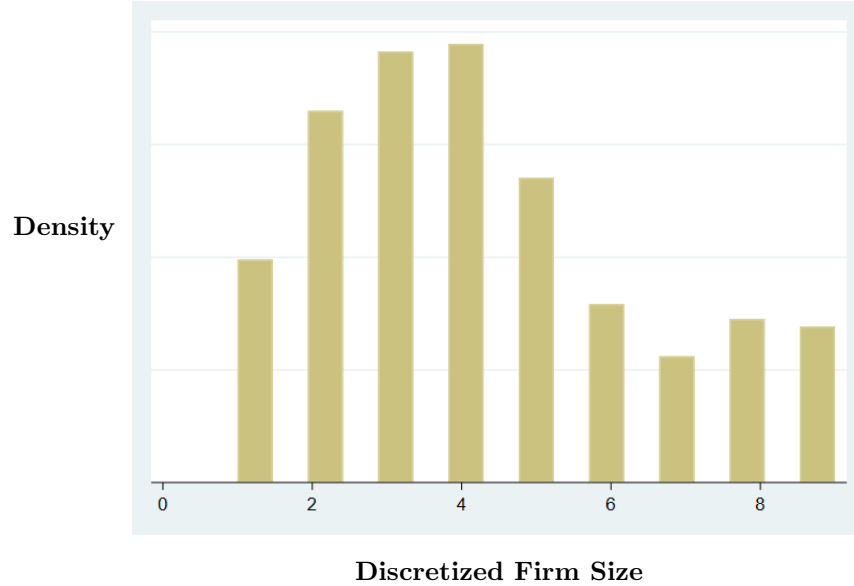
coefficients on the conformity skill gap in Model 5.

Employer size is a categorical variable, so it is decomposed into a series of
200 dummy variables for regression. One employer size dummy contributes to Model
4, and it has a negative coefficient. The negative coefficient might appear to be
evidence against the claim that large employers are more favorable to ACNG
labor. However, the dummy in Model 4 represents an employer size that is less
than average. This implies that the model constant contains a positive effect
205 for larger employers. This subtle implication is reinforced in Model 5. In Model
5, positive coefficients are identified for firms most firm sizes, including firms at
or above the median size.

Figure 1 adds to the evidence that large firms favor alternative credentials.
Firm size is a categorical variable with nine possible responses. Figure 1 plots
210 a numeric transform of the variable along the horizontal axis. The vertical
axis represents the frequency of response for a given value. Responses from
one through eight represent increasing firm size. The negative coefficient on
employer size in Model 4 corresponds to a response of three in the horizontal
axis. A response of nine indicates that the question is not applicable because
215 the respondent is not employed. The ninth response is dropped from Model 5
to prevent multicollinearity. There is no loss of analytical power in Model 5
because the dropped dummy does not represent firms of any size. This figure
further illustrates that the negative coefficient pertains to small firms. The high
willingness to hire on the part of large employers adds to the explanation of low
220 ACNG labor demand from risk aversion.

Models are specified using ordinary least squares (OLS). Models were also
tested in a robust linear model (RLM) and generalized linear model (GLM)
specification. RLM and GLM specification alters factor significance but does not
alter the coefficient value. RLM and GLM models account for abnormal factor
225 distribution. In OLS specification of Model 4, the preferred model, p-values did
not exceed 0.28. In RLM specification, p-values did not exceed 0.41. In GLM
specification, p-values did not exceed 0.38. Overall, OLS seems slightly overfit
and RLM seems slightly underfit compared to GLM. This analysis is mainly

Figure 1: Distribution of Firm Size

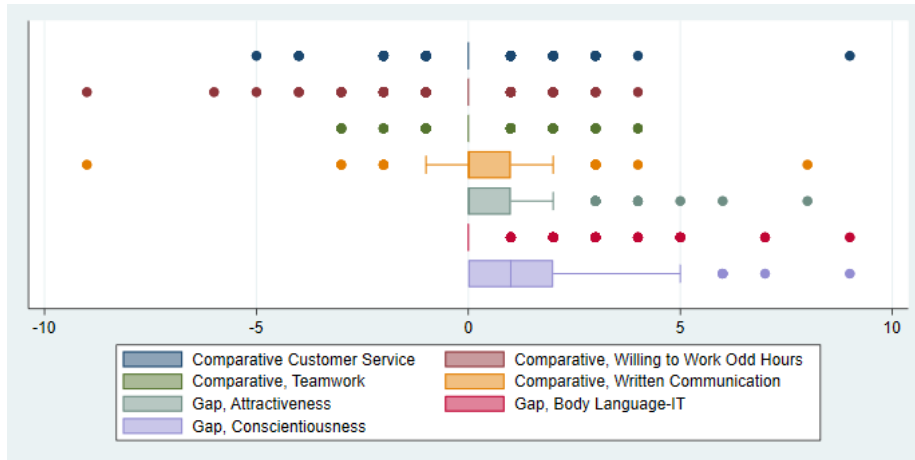


concerned with the direction of factor effects, rather than a precise estimate of
 230 coefficient magnitudes. The important result from robustness testing is that
 coefficients did not change, and the direction for each factor is plausible ($p <$
 $0.5 < p'$).

Seven skill gaps are considered important because they contribute to Model
 4. Four important skill gaps are comparative gaps, and three are absolute gaps
 235 for ACNG candidates. Figure 2 illustrates the distribution for each important
 skill gap. Reflecting on this figure helps inform a diagnostic analysis for use
 by alternative learning providers. ACNG candidates can also supplement their
 own learning to address these gaps. Attractiveness and willingness to work odd
 hours do not seem to be easily remedied. Conscientiousness is difficult to train,
 240 but analysis suggests perception management as a remedy. Perceived consci-
 entiousness has a slight correlation duration (Pearson's $r = 0.21$). Perceived
 conscientiousness can be achieved through longer time to obtain for credentials.
 ACNG supplementation of a credential with additional self-study time may also
 improve perceived conscientiousness.

245 The important body language communication gap is interacted with the
information technology industry variable. The interaction indicates a reduced
penalty for lack of body language communication skills in the information tech-
nology industry. A reduced penalty for soft skill deficit helps explain the partic-
ular flourishing of alternative credentials in the information technology industry.
250 The reduced penalty in this particular industry might be related to its relative
lack of regulation. Another hypothetical explanation is that the reduced penalty
is related to cultural norms in the industry. Suppose that there is a diminished
technical need for social skills in programming. In that case, introverts obtain
a comparative advantage in this field. Further study that includes personal-
255 ity data is encouraged to test this hypothesis. The interacted body language
skill gap and the customer service skill gap are interesting for niche learning
providers.

Figure 2: Distribution of Important Gaps



The gaps in teamwork and written communication skill seem to be best can-
didates for feasible remedy with broad learning provider applicability. Written
communication skill is uniquely amenable to online learning. Written communi-
260 cation skill is also unique in the response distribution. The written communica-

tion skill gap is a comparative gap where the interquartile range favors ACNG labor. This indicates the perception that ACNG providers are generally capable of providing this skill. The distribution reflects positive and negative outliers.

265 Positive outliers indicate that some learning providers have an ability to produce even higher skill, and negative outliers indicates that some learning providers are particularly poor at training this skill. If learning providers are generally effective in training this skill, improvement for ineffective providers is likely to be feasible.

270 Alternative learning providers can use project-based learning and social learning techniques to facilitate teamwork skill development. These are not the most common pedagogies, but they are an established and effective pattern. These methods of instruction can be adapted to an online learning environment. The distribution of responses indicates that improving teamwork skill
275 has neither the maximum penalty nor the maximum return potential compared to improving written communication. This distributional consideration should be balanced against the model results. Model 4 indicates that the effect of teamwork skill on hireability is more reliable and larger in magnitude compared to the coefficient on written communication skill. Targeting both of these two
280 skills is feasible and beneficial to educational quality.

The preferred model explains about one-third of hireability variance, but how much of the explanatory power is attributable to skill gaps? Table 2 provides evidence on the importance of perceived skill gaps and rulebreaker effects relative to other factor groups. Model 4 is composed of factor groups. Table
285 2 summarizes results for simple regressions of each factor group on hireability. Industry and state effects are factor groups regarded in external literature as important for models in the labor market.

Table 2 shows that perceived skill gaps and rulebreaker effects explain more variance in hireability compared to state, industry, and other effects. Industry
290 and state effects are also less stable. When hireability is modeled on industry effects alone, certain industry dummies obtain a p-value approaching 1. In contrast, the least significant absolute skill gaps are statistically significant in

Table 2: Factor Group Explanatory Power in a Simple Regression

Effect Group	Adj R-Sqr	R-Sqr	Max p-value
Absolute Gap	0.0615	0.0703	0.097
Comparative Gap	0.0176	0.0298	0.687
Industry	0.0303	0.0454	0.958
Other Factors	0.0072	0.0288	0.537
Rulebreaker	0.0783	0.0869	0.127
State	0.0469	0.1033	0.772

a simple regression ($p < 0.1$). These findings collectively provide evidence that perceived skill gaps and rulebreaker effects are factors of high importance for models of hireability.

4. Conclusion

This study provides evidence that the general population is favorable to alternative credentials. Hiring managers have higher hireability than employees that are not managers. Alternative credentials signal a qualitatively different basket of skills compared to recent college graduates. ACNG labor is perceived as weak in soft skills, but there are steps which can be taken to mitigate this issue. ACNG labor is viewed as low in conformity, but this results in added hireability on average.

ACNG labor is also viewed as a risky hire. An explanation of low ACNG demand from employer risk aversion better explains results compared to an explanation of selection for conformity. In addition to direct response indicating risk perception, firm size effects support an explanation from risk aversion. Large employers face a lower risk premium for various reasons. For instance, large employers can spread risk across many hires. Risk premiums are also lower

310 for large employers because they have access to better hiring data.

The classic signaling model explanation for employer preference of college graduate labor over ACNG labor is that the college degree provides a comparative signal of conscientiousness and conformity. This paper replicates the importance of conscientiousness. Gaps in perceived conscientiousness are an important effect, but conscientiousness is not seen as an important differentiator
315 of college graduates compared to ACNG candidates.

While hireability is negatively associated with conformity on average, this varies importantly by employer. Descriptions of employer preferences better explain willingness to hire ACNG candidates than skill gaps. Industry level
320 effects are also important, but effects at the employer level are significantly more reliable than industry effects. Skill gaps better explain hireability compared to effects which are widely regarded as important, such as industry and state effects.

Risk aversion and conformity selection are both partially unconscious biases
325 that lead to an inefficient organizational operation. A practical recommendation is for organizations to implement bias controls concerning ACNG evaluation. An example control would be to provide human resource procedures for formal evaluation of particular credentials relevant to specified job families. These procedures provide immediate operational benefits regarding known credentials and
330 job families. These procedures should also be retained for ongoing application as new credentials are developed and encountered over time.

Another action item is for educational institutions, policymakers, and the general public to invest further in correcting alternative education misinformation. A survey on trade schooling taken in 2019 provides evidence on the role
335 of this kind of misinformation[15]. Only 27 percent of respondents correctly responded that lower debt is an advantage of enrolling in trade school relative to college. Additionally, over 75 percent of respondents failed to notice that trade school graduates receive industry employment sooner and receive specialized training when compared to a four-year college.

340 Obtaining a college degree after obtaining some work experience will allow

students to leverage employer tuition benefits. Because ACNG hireability varies importantly by the particular employer, ACNG job candidates can reduce the risk of a lengthy job search by applying to many employers at the outset of the job search. Social networking, online research into firm policy, and consulting
345 with recruiters or other industry specialists are tactics to apprehend whether a particular employer is a likely member of the set that is favorable to ACNG labor.

The preferred model explains about one-third of hireability. Perceived skill gaps and rulebreaker effects account for most of the explanatory power in the
350 model. There are several means of extending this research to provide improved explanatory power. A longitudinal study would allow for causal analysis and improve forecasting of ACNG hireability in the future.

Firms often adopt best practices and new technologies that are first adopted by industry leaders. The result that large employers and employers in the
355 information technology industry may indicate a future of general high support for alternative credentials. Google has not required a college degree since before 2013[17]. Laszlo Bock, then Senior Vice President of People Operations at Google, stated the following in 2013: “After two or three years, your ability to perform at Google is completely unrelated to how you performed when you were
360 in school, because the skills you required in college are very different.” In 2020, Google added three new certificate programs to an existing set and declared that all of its certificates are equivalent to an undergraduate degree for their hiring purposes[18].

If perceived skill represents actual skill, then this study provides evidence
365 that employers should be more willing to hire an ACNG. At the same time, this paper provides evidence that perceived and actual skill levels sometimes do not align. For example, the average recent college graduate in the sample has more perceived technical skills than the average ACNG. The perceived technical deficiency among ACNG labor is surprising because last-mile training, a kind of
370 alternative education, has been specifically recommended in popular literature to remedy the technical skill gaps among recent college graduates. Further study

of the differences between perceived and actual skills is encouraged.

Employers seem to be favorable to individuals with alternative credentials. In many cases, employer-perceived skill gaps are not statistically different when
375 comparing recent college graduates with ACNG candidates. Instead of looking to actual or perceived skill differences, the college degree's social status may be better explained by public ignorance about appropriate alternative programs, a lack of appropriate programs for certain occupations, and public policies that give fair treatment to accredited education.

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Appendix A

Survey on Alternative Credentials

This survey asks questions about so-called alternative credentials. For the purposes of this survey, alternative credentials include certificates, documents, and other proof of receiving education, other than traditional credentials. Traditional credentials include a high school diploma or an undergraduate degree from an accredited university. Five specific examples of an alternative credential include a Certified Project Manager certification, a portfolio of work, a Khan Academy profile, or a Nanodegree from Udacity.

There are two sections. The first section of questions is intended to take 5-10 minutes, and the second section is intended to take less than 10 minutes.

* 1. Do you contribute to hiring and firing decisions at your company?

- ☐ Yes
- ☐ No
- ☐ Unemployed

* 2. If you do contribute to hiring and firing decisions, please write the most common job title for which you make such decisions. If you do not, please write your current or most recent job title. If you have never held a job of any kind, write "n/a."

* 3. Thinking about the job title provided in response to the second question, are you aware of any alternative credentials which would be required, recommended, or applicable for this job?

- ☐ Yes. Certification, license, or other non-degree credentials are required by law. ☐ No. I do not know of any credentials which are common, valued, or legally required in that line of work.
- ☐ Yes. Certification, license, or other non-degree credentials are an industry norm. ☐ Not Applicable
- ☐ Yes. Certification, license, or other non-degree credentials are not required or expected, but there are some which are common and valued.

* 4. How long do you believe it usually takes to obtain an alternative credential?

- ☐ Under a week ☐ Under 6 months
- ☐ Under a month ☐ Under a year
- ☐ Under 3 months ☐ More than a year

* 5. Roughly how many full-time employees currently work for your organization?

- ☐ 1-10
- ☐ 11-50
- ☐ 51-200
- ☐ 201-500
- ☐ 501-1,000
- ☐ 1,001-5,000
- ☐ 5,001-10,000
- ☐ 10,000+
- ☐ I am currently not employed

* 6. For many professions, alternative credentials can qualify a person for an entry-level position.

Strongly
Disagree

Strongly
Agree

★

★

★

★

★

★

★

★

★

★

* 7. People who are willing to break formal or informal rules and norms probably have a hard time getting along with teams or customers. They present a risk to the reputation, productivity, or value of a company.

Strongly
Disagree

Strongly Agree

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* 8. People who are willing to break formal or informal rules and norms might be doing so because the rules hold them back. They could just as easily be high performers as low performers.

Strongly
Disagree

Strongly Agree

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* 9. People who are willing to break formal or informal rules and norms tend to be gifted in the areas of creativity and innovation. They are likely to benefit the culture of a company.

Strongly
Disagree

Strongly Agree

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* 10. Which of these industries most closely matches your profession?

- ☐ Agriculture
- ☐ Education
- ☐ Energy
- ☐ Finance, Investment, or Accounting
- ☐ Health
- ☐ Information Technology
- ☐ Law
- ☐ Manufacturing
- ☐ Military
- ☐ Real Estate
- ☐ Retail
- ☐ Transportation

Other (please specify)

* 11. Do you work in a STEM profession?

- ☐ Yes
- ☐ No
- ☐ Unsure

* 12. What state do you reside in?

* 13. Gender

- ☐ Female
- ☐ Male
- ☐ Other

The next section of this survey is the final section. This section will provide a series of prompts and a response on a scale from 1 to 10 is requested. The response indicates a degree of quality. A response of 1 indicates very little or no quality. A response of 10 indicates a level of quality reserved for the Guinness Book of World Records. There is a total of 52 prompts. The prompts are created by providing 4 variations of 13 basic prompts. Each prompt is meant to be answered within about 10 seconds, so the whole section should take less than 10 minutes.

* 14. The level of physical attractiveness held by an ideal job applicant.

Very Little

Very Much

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* 15. The level of physical attractiveness held by a typical employee at my company.

Very Little

Very Much

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* 16. The level of physical attractiveness held by a recent college graduate.

Very Little

Very Much

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* 17. The level of physical attractiveness held by a non-college graduate with an alternative credential.

Very Little

Very Much

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* 18. The level of emotional intelligence held by an ideal job applicant.

Very Little

Very Much

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* 19. The level of emotional intelligence held by a typical employee at my company.

Very Little

Very Much

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* 20. The level of emotional intelligence held by a recent college graduate.

Very Little

Very Much

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* 21. The level of emotional intelligence held by a non-college graduate with an alternative credential.

Very Little

Very Much

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* 22. The level of salary required by an ideal job applicant.

Very Little

Very Much

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* 23. The level of salary required by a typical employee at my company.

Very Little

Very Much

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* 24. The level of salary required by a recent college graduate.

Very Little

Very Much

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* 25. The level of salary required by a non-college graduate with an alternative credential.

Very Little Very Much

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* 26. The level of written communication skill held by an ideal job applicant.

Very Little Very Much

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* 27. The level of written communication skill held by a typical employee at my company.

Very Little Very Much

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* 28. The level of written communication skill held by a recent college graduate.

Very Little Very Much

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* 29. The level of written communication skill held by a non-college graduate with an alternative credential.

Very Little Very Much

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* 30. The level of verbal communication skill held by an ideal job applicant.

Very Little Very Much

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* 31. The level of verbal communication skill held by a typical employee at my company.

Very Little Very Much

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* 32. The level of verbal communication skill held by a recent college graduate.

Very Little Very Much

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* 33. The level of verbal communication skill held by a non-college graduate with an alternative credential.

Very Little Very Much

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* 34. The level of body language communication skill held by an ideal job applicant.

Very Little

Very Much

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* 35. The level of body language communication skill held by a typical employee at my company.

Very Little

Very Much

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* 36. The level of body language communication skill held by a recent college graduate.

Very Little

Very Much

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* 37. The level of body language communication skill held by a non-college graduate with an alternative credential.

Very Little

Very Much

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* 38. The level of technical job skills held by an ideal job applicant.

Very Little

Very Much

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* 39. The level of technical job skills held by a typical employee at my company.

Very Little

Very Much

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* 40. The level of technical job skills held by a recent college graduate.

Very Little

Very Much

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* 41. The level of technical job skills held by a non-college graduate with an alternative credential.

Very Little

Very Much

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* 42. The level of attention to detail, work ethic, timeliness, and organization of work held by an ideal job applicant.

Very Little

Very Much

* 43. The level of attention to detail, work ethic, timeliness, and organization of work held by a typical employee at my company.

Very Little

Very Much

* 44. The level of attention to detail, work ethic, timeliness, and organization of work held by a recent college graduate.

Very Little

Very Much

* 45. The level of attention to detail, work ethic, timeliness, and organization of work held by a non-college graduate with an alternative credential.

Very Little

Very Much

* 46. The level of willingness to break formal or informal rules and norms held by an ideal job applicant.

Very Little

Very Much

* 47. The level of willingness to break formal or informal rules and norms held by a typical employee at my company.

Very Little

Very Much

* 48. The level of willingness to break formal or informal rules and norms held by a recent college graduate.

Very Little

Very Much

7

* 49. The level of willingness to break formal or informal rules and norms held by a non-college graduate with an alternative credential.

Very Little Very Much

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* 50. The level of customer service skill held by an ideal job applicant.

Very Little Very Much

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* 51. The level of customer service skill held by a typical employee at my company.

Very Little Very Much

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* 52. The level of customer service skill held by a recent college graduate.

Very Little Very Much

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* 53. The level of customer service skill held by a non-college graduate with an alternative credential.

Very Little Very Much

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* 54. The level of teamwork held by an ideal job applicant.

Very Little Very Much

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* 55. The level of teamwork held by a typical employee at my company.

Very Little Very Much

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* 56. The level of teamwork held by a recent college graduate.

Very Little Very Much

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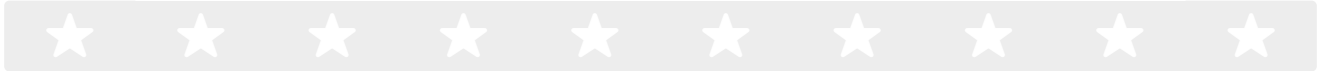
★

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* 57. The level of teamwork held by a non-college graduate with an alternative credential.

Very Little

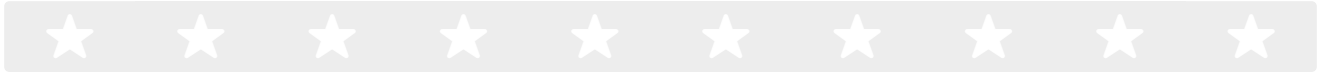
Very Much



* 58. The willingness to commute or travel to a workplace or even as a part of the daily work, as in commercial trucking, held by an ideal job applicant.

Very Little

Very Much



* 59. The willingness to commute or travel to a workplace or even as a part of the daily work, as in commercial trucking, held by a typical employee at my company.

Very Little

Very Much



* 60. The willingness to commute or travel to a workplace or even as a part of the daily work, as in commercial trucking, held by a recent college graduate.

Very Little

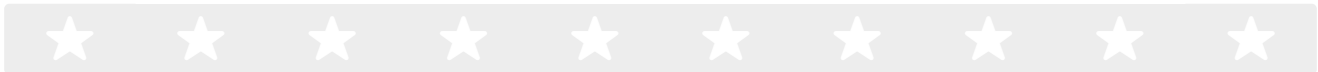
Very Much



* 61. The willingness to commute or travel to a workplace or even as a part of the daily work, as in commercial trucking, held by a non-college graduate with an alternative credential.

Very Little

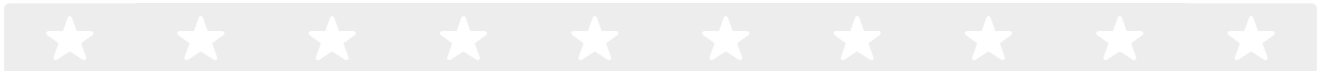
Very Much



* 62. The willingness to work odd hours or a strange schedule held by an ideal job applicant.

Very Little

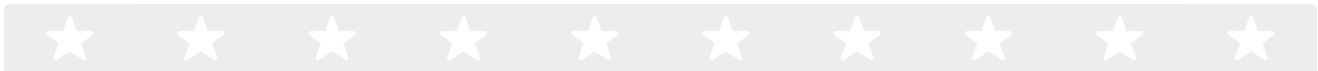
Very Much



* 63. The willingness to work odd hours or a strange schedule held by a typical employee at my company.

Very Little

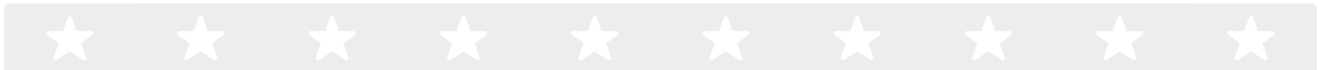
Very Much



* 64. The willingness to work odd hours or a strange schedule held by a recent college graduate.

Very Little

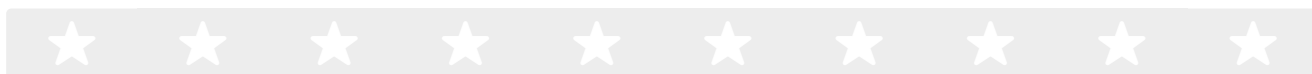
Very Much



* 65. The willingness to work odd hours or a strange schedule held by a non-college graduate with an alternative credential.

Very Little

Very Much



Thank you for your participation!

If you'd like to see the results of this survey, feel free to contact the survey administrator at john@afterecon.com

If you are taking this survey through Amazon Mechanical Turk, use the following survey completion code: 2020July