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

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Abstract

Despite targeting technical skills, vocational school graduates are paid less than college graduates. This paper hypothesizes that conformity selection and a perceived deficit in soft skills substantially explain reduced alternatively credentialed non-college graduate (ACNG) hirability. Microdata from the United States confirm a perceived soft skill deficit for ACNG labor. Results also indicate that conformity is a key factor of hirability, but the direction of effect is heterogenous by employer type. Conformity and perceived skill gaps explain about one third of hirability variance. Perceived soft skill gaps explain about as much as the sum of the effects from state of residence and industry of occupation. Opposite a conventional explanation, the results of this study suggest that hirability is negatively correlated to conformity on average. ACNG job candidates tend to be perceived as creative types and an even mix of high and low performers. Evidence of risk aversion from employers with respect to labor productivity contributes to the explanation of low ACNG demand. The conclusion incorporates discussion of public misperception on the cost of vocational school and suggests that nontraditional postsecondary education is undervalued in the United States.

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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 as useful for technical training, but the traditional college degree retains a wage premium over vocational education. Unemployment, underemployment, and other negative labor outcomes follow a similar pattern[5]. This paper seeks to resolve the apparent descrepancy between these outcomes while preserving the mainline view that employers pay for perceived job candidate skill. To explain the apparent descrepancy, 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 the general population of the United States, including employers, does apply a stigma to the ACNG in which soft skills are assumed to be deficient.

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 pursuing alternative credentials typically intend to leverage the credential toward better employment. 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 analysis. This paper focuses on the comparatively interesting case of alternative credentials as a substitute to the college degree in order to diagnose comparative disadvantage at the skill level. If a specific set of skills effectively explain labor outcome differences, then alternative learning providers could update products to affect better outcomes for their consumers.

The signalling model has become one of the two standard explanations of the value of the college degree. Signalling theory provides three advantages over human capital theory for the purposes of the present study. First, signalling

theory is able to explain labor outcome variance when human capital is held constant.

Second, the signalling 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 sensitivies, assumptions, and errors of various kinds. In this framework, a questionnaire is a second-best design which provides a proxy for the functional measure of skill. Signaling theory takes the reverse approach. According to the signalling model, labor demand is formed on the basis of job candidate value as perceived by an employer. In this framework, a questionnaire is ideal. The manner is in which employer perception relates to job candidate technical skill, if at all, is secondary. An additional benefit of using a questionnaire is the ability to ask hypothetical questions. In pondering hypotheticals, employer evaluation of a credential or signal can be isolated from the human capital variance which occurs in actual job candidates.

Third, signalling theorists have laid out a testable hypothesis for weak labor outcomes among non-college graduates. Following this model, scholars claim that the college degree signals intelligence, conscientiousness, and conformity[7]. Non-traditional education, in contrast, is hypothesized to signal nonconformity. Non-traditional courses can be completed in a shorter span of time and with reduced entry qualifications relative to the traditional degree. For this reason, alternative credentials are thought to signal low concientiousness relative to the college degree.

Research indicates the existence of bliss points for employee concientiousness and conformity from the point of view of an employer. Excess individual concientiousness can disturb team performance[8]. Conformity can lead to a lack of innovation and suboptimal organizational practices[9]. Conformity selection occurs in part through heuristic decisioning rather than conscious choice.

Risk aversion is a distinct explanation for conformity selection. An employer may not be able to evaluate an alternative credential with confidence. From the point of view of such an employer, an ACNG may range in value from a

positive outlier to a negative outlier. The employer may not prefer to hire such a candidate on the basis of risk aversion, even if their point estimate for ACNG labor value is higher than their point estimate for a recent college graduate. If employers with many employees are positively associated with ACNG hirability, this will add weight to an explanation based on risk aversion.

2. Data and Methodology

The hypothesis in this paper is based on a simple model of demand for labor which is clarified in Equations 1a and 1b:

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

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

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}.

This study uses ordinary least squares (OLS) regression analysis to estimate the effect of perceived skill gaps on hirability. An employer is willing to pay more for a relatively hirable individual. This makes hirability a proxy of demand for labor and w_{ij}. In order to explain reduced willingness to pay for ACNG labor relative to college graduate labor, this paper hypothesizes that employers preferentially value soft skills in the course of $f_i(S_j)$. To provide evidence for preferential evaluation of soft skills by employers, one or more soft skills should yield a negative coefficient in a regression on hirability.

Regression analysis in this study is conducted using original cross-sectional data from an online self-completed questionnaire ($n = 212$). The data is available for replication or any other use[1]. Respondents were obtained through

[1]See `https://osf.io/8qtxf/?view_only=95b0c0b0c65e4b7983198cc87c2ab733` for data

the Amazon Mechanical Turk crowdsourcing service. Respondents were United States citizens at or over the age of eighteen, paid for participation, and selected on an opt-in, first-come, first-serve basis. The survey administration took place in July of 2020.

The survey includes 65 questions in two sections[2]. The first section captures respondent characteristics and the second section captures perceived skill relative to hypothetical job applicants. Employer responses did not significantly differ from the general population, so respondent characteristics are also interpreted as employer characteristics.

Regression variables in this study are categorical or Likert-type responses based on a scale from 1 to 10 [3]. Higher Likert-type values indicate greater agreement with a statement that varies by variable. Categorical variables include state of residence, industry of occupation, employer status, firm size, and a measure called duration.

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 decisions. State of residence refers to a state within the United States. Respondents were allowed to select the District of Columbia as a state of residence, but no such responses were obtained.

Three other factor groups are investigated in the regression analysis. These

used in this study.

[2]See Appendix A for a full copy of the survey.

[3]Likert-type responses can be treated as categorical or continuous for the purposes of 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 5 or more points[10]. This paper uses a 10-point scale and treats these data as continuous. A 10-point scale is equivalent to a continous response from 1 to 10 with rounding.

variables are measured using Likert-type units and they include hirability, rulebreaker effects, and perceived skill gaps. Hirability is the dependent factor and it indicates the degree of agreement that, "For many professions, alternative credentials can qualify a person for an entry-level position."

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 the reputation, productivity, or value of a company. This statement received the least agreement and greatest response variance among three qualitatively different descriptions of people that are willing to break rules ($\mu = 6.40, \sigma = 2.55$).

The second statement indicates that nonconformists are held back by rules and "could just as easily be high performers as low performers." This statement received the most agreement and least variance among rulebreaker statements ($\mu = 7.42, \sigma = 1.91$). 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 third description of nonconformists states that they tend to be gifted in the areas of innovation or creativity, and that such people may benefit the culture of a company ($\mu = 7.25, \sigma = 2.03$).

Perceived skill gaps are computed two ways from perceived skill questions in the second section of the survey. Perceived skill gaps are measured seperately with and without overqualification effects. Overqualification effects have been identified as important in external research[11, 12], but these effects are sometimes ignored during skill gap analysis[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 is asked to imagine and report skill levels for the ideal candidate, the average actual employee, the average recent college graduate, and the average ACNG. Raw perceived ACNG skill gaps are calculated by differencing

the perceived skill of an ideal candidate with the perceived skill of an ACNG. The perceived skill gap with overqualification effects equals the raw perceived skill gap. The perceived skill gap without overqualification effects is calculated as the raw skill gap or zero if the raw skill gap value is negative.

Rulebreaker effects and perceived skill gaps are structurally linked. Respondents are asked to evaluate the soft skill of nonconformity, or "willingness to break formal or informal rules and norms." Nonconformity interacts with employer disposition to rulebreaking. For this reason, discussions on the importance of skill gaps include discussion on rulebreaker effects.

These methods allow for identification of a preferred model that explains hirability using perceived ACNG skill gaps. The identified model will support the hypothesis if soft skills are more important than technical skill gaps. The model will support the risk aversion explanation of ACNG hirability over an explanation from conformity selection if large employer size is positively associated with hirability.

Comparative analysis provides additional confidence in the data by replicating the hirability gap between ACNG labor and recent college graduates reported in external research. A comparative skill gap variable is constructed for each perceived skill gap that is important in the preferred hirability model. Comparative skill gap variables are constructed by subtracting perceived recent college graduate skill from perceived ACNG skill. Multiple regression of these comparison factors on hirability demonstrates which, if any, perceived skill gaps are important distinguishers of the ACNG from the college graduate. Identification of significant differences with a negative total effect on hirability will replicate external data on the lower job market value of ACNG labor and provide a diagnostic on which skill or skills must be better addressed through alternative learning programs.

3. Results

3.1. Identification of the Preferred Model

Results confirm that employers, and the population in general, associate a soft skill deficit with ACNG candidates. Employer status was associated with an insignificant positive coefficient on hirability. Hirability was generally positive ($\mu = 7.57, \sigma = 1.80$) and depends critically on rulebreaker effects. Rulebreaker effects have more explanatory power than perceived skill gaps, and perceived skill gaps have more explanatory power than widely recognized factors like state of residence and industry of occupation. Duration effects, positive nonconformity selection, and the lack of important differences in conformity between ACNG and college graduate labor provide support for an explanation of ACNG hirability based on risk aversion rather than positive conformity selection.

Table 1 reports statistics for five multiple regressions. Coefficients are reported for selected variables for brevity. Selected variables include rulebreaker effects and any perceived skill gap which is important in any specification. In these models, an important factor is one that improves the adjusted explanatory power of the model when included. These factors are not constrained to have a p-value less than 0.1, but as a rule of thumb they happen to have a p-value less than 0.3. Of the thirteen perceived skill gaps tested, eight were important in at least one specification. Seven skill gaps were important in Model 5, the preferred model. An important interaction between the information technology industry and perceived body language communication skill was also identified.

Model 1 allows for overqualification and Model 2 uses the perceived skill gap measures that exclude overqualification effects. Models 3 and 4 are equivalent to models 1 and 2, respectively, after normalizing for industry, state, and firm size effects. Effect normalization involves retaining those factors which are robust across both models 1 and 2. For example, Alabama has a significant effect when overqualification is allowed in Model 1. The effect for respondent residence in the state of Alabama is insignificant when overqualification is excluded in Model 2. Because Alabama is sensitive to this specification change, it is considered

Table 1: Table of Coefficients for Multiple Regressions on Hirability, Selected Variables

	Model 1	Model 2	Model 3	Model 4	Model 5
Gap, Body Language	-2.240e-01*	-3.831e-01**	-1.507e-01+	-3.155e-01*	-3.060e-01*
	(8.314e-02)	(1.124e-01)	(8.980e-02)	(1.173e-01)	(1.145e-01)
Gap, Body Language-IT	2.199e-01+	2.298e-01	1.837e-01	2.791e-01	2.771e-01+
	(1.269e-01)	(1.656e-01)	(1.334e-01)	(1.707e-01)	(1.665e-01)
Gap, Commute		-2.320e-01++	-4.953e-02	-1.197e-01	-1.582e-01
		(9.720e-02)	(6.862e-02)	(1.023e-01)	(1.010e-01)
Gap, Conscientiousness	2.416e-01*	3.223e-01*	1.387e-01	2.174e-01+	2.175e-01++
	(8.000e-02)	(1.045e-01)	(8.483e-02)	(1.129e-01)	(1.093e-01)
Gap, Customer Service	-1.259e-01+	-1.512e-01	-1.253e-01+	-1.276e-01	-1.323e-01
	(6.389e-02)	(9.599e-02)	(7.162e-02)	(1.037e-01)	(1.009e-01)
Gap, Nonconformity		-6.336e-02	-3.896e-02	-8.535e-02	-1.034e-01
		(1.028e-01)	(6.054e-02)	(1.082e-01)	(1.036e-01)
Gap, Salary		-1.135e-01	3.873e-02	-6.250e-03	
		(8.284e-02)	(6.597e-02)	(8.575e-02)	
Gap, Teamwork		1.227e-01	6.812e-02	1.287e-01	1.131e-01
		(9.179e-02)	(6.963e-02)	(9.697e-02)	(9.505e-02)
Gap, Technical	-1.274e-01+		-9.408e-02	-1.010e-01	-9.806e-02
	(7.443e-02)		(7.702e-02)	(1.023e-01)	(1.001e-01)
Rulebreaker, Culture Add	2.612e-01**	2.829e-01**	2.114e-01*	2.279e-01*	2.235e-01*
	(7.057e-02)	(7.015e-02)	(7.187e-02)	(7.190e-02)	(7.036e-02)
Rulebreaker, Risky	1.688e-01**	1.758e-01**	1.517e-01*	1.472e-01*	1.686e-01**
	(4.993e-02)	(4.813e-02)	(5.160e-02)	(5.063e-02)	(5.006e-02)
Rulebreaker, Rockstars	1.406e-01+	1.748e-01++	1.669e-01++	1.546e-01++	1.655e-01++
	(7.646e-02)	(7.245e-02)	(7.851e-02)	(7.754e-02)	(7.599e-02)
Adj R-sqr	0.3100	0.3491	0.2317	0.2554	0.2866
R-sqr	0.4408	0.4663	0.3409	0.3613	0.3880

Standard errors in parentheses. $^{+}$ $p < 0.10$, $^{++}$ $p < 0.05$, * $p < .01$, ** $p < .001$

For each model, the probability of a greater F-statistic is less than 0.0001 and the sample size is 212.

nonrobust and excluded after normalization. Employer status was positive in all models, but it was only significant in models 1 and 2. Significance loss on employer status during normalization suggests that the effect of employer status on hirability critically interacts with industry, state of residence, and firm size, which are the normalized effects.

Model 5 is specified as Model 4 plus two adjustments. First, the factor for salary is dropped. The salary factor improved adjusted explanatory power in Model 2, but it provided no such benefit in any other model. Moreover, the p-value of this factor was unacceptably low in Model 4 ($p > 0.9$). The second adjustment is to insert a variable for duration[4]. The belief that it takes more than a year to obtain an alternative credential is positively correlated with hirability ($\beta = 0.875, p < 0.01$).

The preferred model is able to explain roughly one third of the variance in hirability. Rulebreaker effects are significant invariant to specification. Six of the seven perceived skill gaps in the preferred model are measures of soft skill. The coefficient for the perceived technical skill gap is insignificant, but it does possess an intuitive negative sign which is robust to specification. The dominant effect of soft skills in the preferred regression supports the main hypothesis.

In the classic signalling explanation of low ACNG demand, the ACNG signals an abnormal lack of concientiousness and conformity. Regression analysis raises three problems for the conformity component of the classic explanation. These problems are robust to the specification and operationalization of conformity. First, rulebreaker effects are positively related to hirability. Secondly, a gap in perceived nonconformity skill yields a negative coefficient on hirability. This gap effect is equivalent to an association of low hirability and high conformity.

Overqualification is ignored in Model 5, so a gap indicates that the job can-

[4]Duration is a categorical variable which was important in both Models 1 and 2. As a categorical variable, it was decomposed into a boolean series for factor analysis. Models 1 and 2 retained one or more duration boolean factors, but none overlapped. As a result, duration was dropped from Models 3 and 4.

didate has a low level of skill compared to an ideal candidate. In this model, an increase to gap size is equal to a reduction in the perceived level of skill possessed by a job candidate. The negative coefficient for nonconformity therefore indicates that a reduction to nonconformity is associated with reduced hirability. Similarly, an increase to the level of perceived nonconformity shrinks the gap size and produces a positive change in hirability. The positive relation between nonconformity and hirability is reinforced by a summary statistic, which is that the average actual employee is perceived to have a higher level of nonconformity than both the ACNG and the recent college graduate.

The third reason that an ACNG nonconformity signal does not explain reduced hirability is that the ACNG and recent college graduate do not significantly differ in perceived levels of conformity. This is presently demonstrated using summary statistics, but Table 3 also provides regression analysis for comparative skill gaps. The average level of perceived nonconformity for the ACNG is 6.43 with a standard deviation of 2.25. The average for a recent college graduate is 6.29 with a standard deviation of 2.36. Informally, a lack of significant difference is apparant in that the means differ by less than one quarter of a standard deviation. Formally, the F-statistic from an analysis of variance ($F = 19.25$) and Pearson's chi-squared test ($\chi = 298.80$) both indicate a probability of independence which is less than 0.0001.

The coefficient on conscientiousness is significant and positive across specifications. Intuition would dictate that a large gap in conscientiousness would be associated with reduced hirability. Regression of the perceived gap in conscientiousness alone on hirability does produce the expected negative coefficient. The explanation for the sign change is that the direct measure of conscientiousness is an attenuating effect within certain specifications. Conscientiousness is cross-correlated with several factors in all models from Table 1. It could be the case that negative variation in conscientiousness is partialled out into these cross-correlates. This hypothesis is tested by removing other skill gap factors and the rulebreaker effects from Model 5. The other factors for state, industry, duration, and employer status are retained. When specified as such, the

factor for the perceived concientiousness skill gap yields the expected negative coefficient ($\beta = -0.084, p < 0.31$).

Employer size is an important factor in the preferred model. The largest category of employer is positively associated with hirability. This finding supports the explanation of hirability from risk aversion over positive conformity selection.

Some state and industrial effects are identified. No particular relation among state effects was found, but further comparative policy research is encouraged. With respect to industry, an interesting interaction between body language skill and employment in the information technology industry yields a positive coefficient. Body language skill gaps on their are associated with reduced hirability. The interaction indicates a reduced penalty for a lack of body language communication skill in the information technology industry. With less confidence and more generality, the interaction indicates a reduced penalty for generalized soft skill deficiency in the information technology industry.

A reduced penalty for soft skill deficit helps explain the particular flourishing of alternative credentials in the information technology industry. The reduced penalty in this particular industry might be related to a relative lack of deregulation in the industry. Another explanation is that the reduced penalty may be related to cultural norms in the industry. There is less technical need for social skill in programming, so introverts may obtain a comparative advantage in this field. These effects are not confirmed in the current study. Further study which includes job candidate personality data could test this hypothesis.

3.2. Explanatory Share of Perceived Gaps

The preferred model explains about one third of hirability variance, but how much of the explanatory power is attributable to perceived skill gaps? Table 2 provides evidence on the importance of perceived skill gaps and rulebreaker effects relative to other factor groups. Industry and state effects are factor groups that are widely regarded in the external literature as important for models in the labor market. Table 2 shows that perceived skill gaps and rulebreaker ef-

Table 2: Factor Group Explanatory Power in a Simple Regression

Effect Group Name	Adj R-Sqr	R-Sqr	Max p-value
Industry	0.0185	0.0510	0.288
Rulebreaker	0.1432	0.1554	0.053
Skill Gaps with Overqualification	0.0558	0.0737	0.106
Skill Gaps without Overqualification	0.0758	0.0933	0.115
State, Robust	0.0177	0.0503	0.227
State, Semi-Robust	0.0034	0.0648	0.831

fects explain more variance in hirability than do the widely utilized variables for industry and state. Rulebreaker effects collectively explain more than three times as much response variance as do industrial or state effects.

A comparison of simple regressions of perceived skill gaps on hirability reproduces the finding from multiple regression analysis that overqualification effects reduce explanatory power. Overqualification effects are heterogenously signed and curved by skill, so nonlinear analysis where the overqualification effects are isolated in distinct factors is likely to improve explanatory power. Such analysis would also require a larger sample in order to compensate for the loss of degrees of freedom.

Semi-robust state effects are state effects which are significant in any multiple regression described in Table 1. Robust state effects are the significant factors in a simple regression of semi-robust state effects on hirability. Illinois is an example of a state effect that appears in models 1 and 2 from Table 1 but is not significant in a simple regression of semi-robust state effects on hirability.

The r-squared associated with a simple regression of semi-robust state effects

is greater than the r-squared associated with robust state effects. Analysis has shown that perceived skill gaps that include overqualification effects are comparatively weak representations of perceived skill gaps for models of hirability. A conservative lower-bound on the explanatory ratio of perceived skill gaps to state effects can be constructed by using these two measures. Perceived skill gaps conservatively explain about 14 percent more variance in hirability than do state effects[5].

With overqualification, perceived skill gaps explain about fifty percent more of the variance in hirability compared to industry or robust state effects. Without overqualification, the adjusted explanatory power of perceived skill gaps is about three times the adjusted explanatory power of industry or state effects. Rulebreaker effects are about twice as important as perceived skill gaps. These findings collectively provide evidence that perceived skill gaps and rulebreaker effects are factors of high importance for models of hirability.

3.3. Perceived Gaps Compared to the Recent College Graduate

Table 3 provides two models of hirability where comparative skill gaps are the independent factors. Model 6 is derived from Model 5 by replacing perceived skill gap factors with comparative perceived skill gap factors and dropping other factors. Model 7 is derived from Model 6 by consolidating factors in order to maximize adjusted explanatory power. The four factors that were eliminated in the consolidation from Model 6 to Model 7 had a p-value greater than 0.55. The maximum p-value in Model 7 is less than 0.16.

Models 6 and 7 demonstrate that a few soft skills do constitute a significant difference between groups. The main differentiator between ACNG labor and the recent college graduate is body language communication skill. ACNG labor is perceived as comparatively deficient in this skill, and the comparative deficiency is associated with reduced ACNG hirability.

Concientiousness and willingness to commute are the other two comparative

[5]This is computed as $(0.0737/0.0648) - 1 = .1373$ and rounded to 0.14.

Table 3: Multiple Regression of Comparative Skill Gap on Hirability

	Model 6	Model 7	Model 8
Body Language	-3.295e-01*	-3.395e-01*	-1.444e-01
Commute	1.498e-01	1.574e-01	8.030e-02
Conscientiousness	1.416e-01	1.508e-01	-5.239e-02
Customer Service	-1.493e-02		
Technical	4.955e-02		
Teamwork	1.552e-02		
Nonconformity	-5.822e-02		
Body Language^2			3.400e-02
Body Language^3			-1.938e-02
Commute^2			-1.124e-02
Commute^3			2.334e-03
Conscientiousness^2			-4.646e-02
Conscientiousness^3			3.801e-02
Adj R-sqr	0.0311	0.0474	0.0571
R-sqr	0.0633	0.0609	0.0973
p(F)	0.0610	0.0044	0.0125

* $p < .01$, ** $p < .001$

skill gaps in Model 7. These two factors are positively signed, smaller in magnitude, and lower in significance when compared to the factor for body language communication skill. Model 7 plus summary statistics on the average value for each independent variable demonstrates that the average total effect of comparative skill gaps on hireability is negative[6]. This replicates external research which shows lower demand for ACNG labor.

The positive coefficient on willingness to commute and conscientiousness in Model 7 are unexpected. A simple interpretation of these coefficients is that when a recent college graduate possesses an ideal level of these skills, relative ACNG deficiency is valuable. Model 8 expands these linear factors with marginal effects. Linear body language effects were the most significant effect in Model 7, but they are the least significant in Model 8. The quadratic factor for body language is the only significant factor in this model. More importantly, all quadratic effects are more significant than their linear counterparts in this model. There is not a single linear factor with a p-value less than 0.6 in Model 8. Model 9 reconsolidates factors by significance and retains only quadratic factors.

Model 9 is the preferred comparative gap regression because the factors in the model are each strong and the overall model also maximizes adjusted explanatory power. Quadratic factor coefficients from Model 9 can be interpreted as marginal effects. The negative marginal effects on willingness to commute and concientiousness are particularly intuitive when combined with summary statistics. The average perceived level of concientiousness for the ACNG is 7.11 ($\sigma = 1.85$), for the recent college graduate it is 7.14 ($\sigma = 1.87$), and for the ideal candidate it is 8.10 ($\sigma = 1.65$). Willingness to commute follows a similar pattern. These summary statistics clarify that small comparative gaps gener-

[6]The respective mean values for the comparative gaps in perceived body language skill, willingness to commute, and conscientiousness are -0.1415, 0.0943, and 0.0330. The average total effect on hireability attributable to these effects is computed as: $-0.0579 = -0.3395 * 0.1415 - 0.1574 * 0.0943 + 0.1508 * 0.0330$.

ally occur when both forms of labor are close to the ideal level of perceived skill. Negative comparative marginal effects indicate that hirability increases as comparative gaps decrease.

Negative marginal effects also indicate that hirability decreases as comparative gaps increase. For both willingness to commute and concientiousness, the average recent college graduate has higher perceived skill than the average ACNG. This means that large skill gaps tend to be cases where the ACNG is disproportionately deficient, so reduced hirability is expected.

The positive marginal effects on body language in models 8 and 9 are both counterintuitive and misleading. Figure 1 shows a scatter plot of the squared difference in body language communication skill against hirability. The residuals are heteroscedastic and exhibit an r-shaped curve. This indicates that this squared factor itself is subject to a marginal effect. A cubic factor can capture marginal effects on quadratic terms. This is why Model 9 includes a cubic factor for comparative body language. The total effect of a comparative body language gap on hirability is negative, as expected[7].

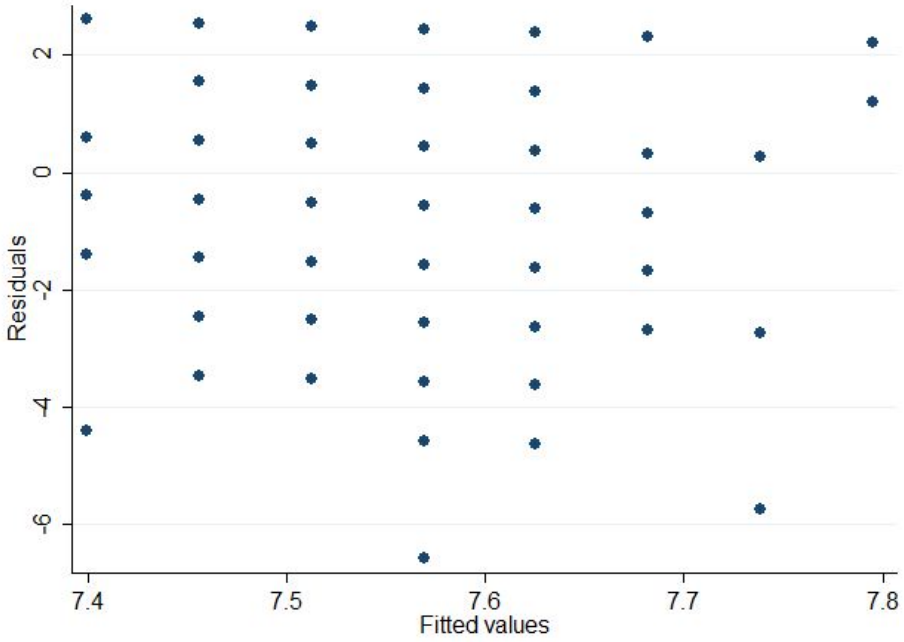
This relation is described in Model 10 from Table 3. This model shows that quadratic effects are positive but insignificant. The apparant important of quadratic effects in Model 9 obfuscates the more significant cubic relation. Comparative gaps in body language

Model 9 provides a skill-level diagnostic in service of closing the demand gap. Training for body language communication skill can be incorporated into alternative learning provider products, or alternative learning provider consumers can append additional training and credentials to their skill profile which target this skill. This result should not be interpreted as a hireability difference due to generalized communication skill. Perceived skill gaps for emotional intelligence, verbal communication, and written communication are insignificant.

Alternatively educated individuals can offset perceived concientiousness deficit

[7]The average difference in body language is 0.1415. The total effect is computed as: $= *0.1415 + *0.1415^2 + *0.1415^3$.

Figure 1: Scatterplot of Residual and Fitted Values for Comparative Gap in Conscientiousness



by provisioning work history or results of a personality test. External research indicates that psychological therapy and other interventions can boost conscientiousness in some cases[14].

4. Conclusion

This study provides evidence that skill signals are an important factor of hirability and are unique for the ACNG. Perceived skill gaps do a better job of explaining hirability than do other widely recognized effects including industry and state effects. Employer factors better explain candidate hirability than do the perceived skill gaps themselves. Technical skill gaps were identified with less relevance to the hiring decision when compared with soft skill gaps for the ACNG job candidate.

This paper provides evidence that some employers engage in conformity

selection as a means of avoiding risk to the reputation, productivity, or value of a company. An explanation from risk aversion fully this kind of conformity selection and also explains other behavior. Respondents were most favorable to the description of nonconformists as individuals that could just as easily be high performers as low performers. Aversion to this kind of labor is better explained as risk aversion rather than positive selection for conformity.

Risk aversion and conformity selection are both partially unconcious biases which lead to suboptimal organizational operation. A practical recommendation is for organizations to implement bias controls with respect to ACNG evaluation. An example control would be to provide human resource procedures for formal evaluation of particular credentials which are relevant to specified job families. These procedures can be immediately executed among known credentials and job families. These procedures should be retained for ongoing application as new credentials are developed and encountered over time.

Some evidence on the role of misinformation is demonstrated in a survey on trade schooling taken in 2019[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. Obtaining a college degree after obtaining some work experience will allow students to leverage employer tuition benefits. Because ACNG hirability varies importantly by particular employer, ACNG job candidates are advised to apply to a substantial number of employers at the outset of the job search. Insight into ACNG hirability at a particular firm can be obtained prior to application through social networking with employees of the firm, online research into the policies of the target employer, or consulting a recruiter that specializes in the target employment industry.

The preferred model explains about one third of hirability. Perceived skill gaps and rulebreaker effects account for most of the explanatory power in the model. The explanatory power of this study can be meaningfully improved in a few ways. Longitudinal study would allow for causal analysis and improve

forecasting of ACNG hirability in the future. Other research has conducted some dynamic analysis of the same dependent variable with different regressors[16]. Integrated analysis would be useful for replication and the generation of new models of better explanatory power. Analysis that includes overqualification effects and heterogeneous nonlinear relations between skill gaps and hirability would improve estimates of hirability for a candidate of a particular skill profile.

This paper noted that large employers and the information technology industry has a peculiar suceptibility to alternative credentials, so recent changes implemented by Google may be indicative of future trends. Google has not required a college degree since prior to 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 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 would be treated as the equivalent of an undergraduate degree for their hiring purposes[18].

If perceived skill is representative of actual skill, then the current study concludes 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 is perceived to have better technical skill compared to the average ACNG. This is surprising because last mile training, a kind of alternative education, has been specifically recommended in popular literature as a remedy for the technical skill gaps that exist among recent college graduates.

Employers seem to be favorable to individuals with alternative credentials. In many cases, employer-perceived skill gaps are not statistically different when comparing recent college gradutes with ACNG candidates. Social preference for the college degree may be better explained by public ignorance about appropriate alternative programs, a lack of appropriate programs for certain occupations, and government financial and other policy which gives preference to accredited education.

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