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

John Vandivier[a]

[a]*4400 University Dr, Fairfax, VA 22030*

Abstract

Despite targeting technical skills, vocational school graduates are paid less than college graduates. This paper hypothesizes that nonconformity stigma and a perceived deficit in soft skills substantially explain reduced alternatively credentialed non-college graduate (ACNG) hireability. Results from an original survey in the United States indicates that willingness to break rules is a key factor of hireability, but the direction of effect is heterogenous by employer type. ACNG job candidates tend to be perceived favorably as creatives or as possible high performers. Selection of traditional candidates is better explained as an employer risk aversion behavior, rather than selection for conformity as a direct property of quality labor. Perceived skill gaps are more important than widely recognized factors of hireability including industrial and state effects. Soft skills are particularly important. Recent college graduates and ACNGs are seen as similarly lacking in soft skills including conscientiousness. The population of the United States systematically comparatively devalues alternative postsecondary education. Results collectively indicate that nontraditional postsecondary education is undervalued.

Keywords: education economics, alternative education, candidate fit, job fit, candidate matching

2010 MSC: I21, I22, J20

Email address: jvandivi@masonlive.gmu.edu (John Vandivier)

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 maintains the orthodox view that employers pay for perceived job candidate skill. To explain inferior labor outcomes, this paper tests the hypothesis that employers expect an offsetting non-technical skill deficit when considering an alternatively credentialed non-college graduate (ACNG).

Alternative credentials refer to credentials other than the undergraduate degree[8]. 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 factors of ACNG hireability in order to validate whether ACNG labor outcomes are a general problem, or perhaps a problem limitted in scope to a specific set of skills. If the gap is limitted to a particular set of skills, such as soft skills, then alternative credential suppliers could modify their credentialling requirements to overcome the outcome deficit.

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 survey 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 skill measures would be complicated and prone to measurement sensitivies, assumptions, and errors of various and potentially subtle kinds. Survey measures could be used as a second-best proxy, but they would never be an ideal measure of human capital. 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. Whether this corresponds to any concrete ability is secondary. Employer perception can be assessed through a simple survey. 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 job candidate human capital variance.

Third, signalling theorists have already 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[6]. Non-traditional education, in contrast, is hypothesized to signal nonconformity. Non-traditional courses can also 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 not to signal concientiousness, or conscientiousness.

Research indicates a goldilocks level or bliss point for both concientiousness and conformity is likely to exist. Excess individual concientiousness can disturb team performance[12]. Conformity can lead to a lack of innovation and suboptimal organizational practices[7]. Psychologists also state that conformity selection may occur through heuristic decisioning rather than conscious choice.

Risk aversion is another explanation for conformity selection. An employer may not be able to value an alternative credential. 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 hireability, this will add weight

to an explanation based on risk aversion.

2. Methodology

This study uses ordinary least squares regression analysis to estimate the effect of perceived skill gaps on willingness to hire. Perceived skill gaps and willingness to hire are included in original response data collected by online survey ($n = 212$). Observations are cross-sectional and taken at the individual level. The data is available for replication or any other use[1].

Respondents were obtained through the Amazon Mechanical Turk crowdsourcing service. Respondents were United States citizens at or over the age of eighteen. Opt-in respondents were paid for participation and selected on a first-come, first-serve basis up to a quota of 200. The survey administration took place in July of 2020.

The survey includes 65 questions in two sections. The first section of responses describe the respondent. There are 13 questions in this section. The second section identifies perceived skill gaps for 13 skills. Each section begins with a contextual message to normalize response anchoring. Questions are provided in nonrandom order for the same reason. Appendix A provides a copy of the survey.

Data from the second section is used to calculate perceived skill gaps. For each of 13 skills, the respondent is asked to imagine four types of candidates. One type of candidate is an ideal candidate. At a high level, skill gaps are calculated by differencing skill levels of the ideal candidate with others.

Perceived skill is reported on a scale from 1 to 10. Perceived skill is reported for the ideal candidate, the average actual employee, the average recent college graduate, and the average ACNG. Each skill gap has two associated measures. One measure allows for overqualification in a skill and the other does

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

not. Overqualification effects have been identified as important[9, 10], but these effects are sometimes ignored during skill gap analysis[11].

When overqualification is allowed, the skill gap is measured as a raw skill gap. The raw skill gap is the skill level of the ideal candidate less the skill level of the actual candidate. The skill gap without overqualification is calculated as the raw skill gap or zero if the raw skill gap value is negative.

3. Results

ACNG (ACNG) hireability was generally positive. The mean response was 7.5 on a scale from one to ten ($\sigma = 1.80$). Employer status was not associated with a significant response effect. Perceived skill gaps explained a significant and important portion of hireability variance.

Table 1 compares perceived skill gap explanatory power in a simple regression to explanatory power of other simple regressions involving factors of known relevance to hireability. Allowing for overqualification seems to weaken explanatory power. Overqualification effects seem to be heterogeneously signed per skill, so generalizing weakens overall explanatory power relative to ignoring these effects. With overqualification, perceived skill gaps explain about fifty percent more than industrial effects 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. Semi-robust state factors are dummy variables by state which are significant in a multiple regression. Robust state factors are subset of semi-robust state factors which are additionally significant in a simple regression.

Table 1 also describes the explanatory power of so-called rulebreaker effects. Whether the candidate is perceived as a rule breaker is a perceived skill gap, but employers evaluate this gap in a heterogenous and multispecific way. In the first place, this heterogenous evaluation has sign and magnitude implications for the dependent variable of interest. Secondarily, heterogenous evaluation implies a qualitatively different evaluation. These differences are captured using three

Table 1: 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

questions in the first section of the survey.

The three rulebreaker questions measure respondent agreement on a scale from 1 to 10 with statements about rulebreakers, or "People who are willing to break formal or informal rules and norms." The first statement indicates that rulebreakers 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 states that people break rules which hold them back, and that rulebreakers "could just as easily be high performers as low performers." This statement received the most agreement and least comparative response variance as a rule breaker description ($\mu = 7.42, \sigma = 1.91$). 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, but they actually believe nonconformity may signal positive outlier potential. The third descrip-

tion of rulebreakers 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 ($\mu = 7.25, \sigma = 2.03$).

Each of the three rulebreaker effects turn out to be independently important. These effects collectively explain more than three times as much response variance as do industrial or state effects. Rulebreaker effects are about twice as important as perceived skill gaps. This is not taken to be a general lesson about skill gaps. Willingness to break rules is a special case of a behavior which is valuable under certain parameters. This contrasts with something like poor communication skill which is generally detrimental.

Table 2 reports selected factor statistics across five least squares multiple regressions. The selected factors which are reported include any perceived skill gap which is important in any specification. Factor importance is determined by the ability of a factor to improve model adjusted explanatory power. Model 1 is a multiple regression using skill gaps that allow for overqualification. Model 2 is a multiple regression without overqualification.

Models 3 and 4 are equivalent to models 1 and 2, respectively, after normalizing for industry, state, and company size effects. These effects are normalized for robustness by retaining those factors which appear in both model 1 and model 2. For example, some state effects are important in one specification and not in the other. Such state effects are dropped in models 3 and 4.

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 add a duration factor. The duration factor is a measure of the length of time a respondent believes it takes to earn an alternative credential[2]. The duration factor which indicates that the respondent believes it

[2]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

Table 2: Table of Coefficients for Multiple Regressions on Hireability, 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, Rule Breaker		-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

+ $p < 0.10$, ++ $p < 0.05$, * $p < .01$, ** $p < .001$

takes more than a year to obtain an alternative credential is significantly and importantly associated with improved willingness to hire ($\beta = 0.875, p < 0.01$).

An individual is considered an employer if they state that they contribute to hiring and firing decisions. Employer effects are positively signed in all five models, but the significance is lost after normalizing effects. This suggests that ACNG hireability is sensitive to industry, state of residence, and firm size, which are the normalized effects.

The preferred model is able to explain roughly one third of the willingness to hire. Thirteen skill gaps were investigated, and seven contribute to the preferred model. One of the skill gaps in the final model is technical skill. The technical skill gap is statistically insignificant, but it is robust in sign across models and it does possess the expected negative sign. The other six important factors are soft skills. Perceived skill gaps in body language and conscientiousness are the most important factors in the model. The relative importance of soft skill gaps, and conscientiousness in particular, adds weight to a revision of the usual signalling explanation as the most plausible story.

An important and complicated finding involves conscientiousness. The effect is robustly positive in multiple specifications. Simple intuition would indicate that a large conscientiousness gap is associated with reduced hireability. A simple regression of conscientiousness on hireability does produce the expected negative coefficient. There are two reasons for the sign change on conscientiousness in the multiple regression. The first reason is bliss point seeking and the second is an explanation from attenuation.

As previously discussed, excess individual concientiousness can disturb team performance[12]. It follows that there is some bliss point level of concientiousness. As a result, the sign of the coefficient on concientiousness is sensitive to the relationship between the model constant and the bliss point. If the model constant is above the bliss point, concientiousness is expected to be positively

2 retained one or more duration dummies, but none overlapped. As a result, duration was dropped from Models 3 and 4.

signed. The current data is consistent with this explanation from bliss point seeking. In a simple regression of conscientiousness in hireability, the model constant is about 7.5, and the coefficient on conscientiousness is negative. In the multiple regression, the model constant is near 0.5, and the coefficient on conscientiousness is positive.

The second explanation is that the direct measure of conscientiousness is attenuating an overstatement of the effect in the multiple regression. Conscientiousness is importantly cross-correlated with several factors including willingness to commute and customer service skill. Conscientiousness also structurally interacts with rulebreaker effects. In theory, a person that is high in concientiousness will tend not to break rules. These factors are entered independently in the multiple regression, so a partial measure of conscientiousness is entered in redunantly. The direct factor for conscientiousness corrects, or attenuates, the overstated effect which is represented in those the correlated independent factors. Removal of other skill gap factors and rulebreaker factors from Model 5 demonstrates this by yielding a negative concientiousness coefficient ($\beta = -0.084, p < 0.31$).

The importance of conscientiousness does not add weight to the classic signalling explanation. The conscientiousness gap is not a comparative gap between a recent college graduate and a non-college graduate. It is a gap between an ideal job candidate and an ACNG. An important note is that the conscientiousness gap among recent college graduates is statitistically no different from an ACNG. Unsurprisingly, the candidate perceived to have a minimal conscientiousness gap is the typical employee already working in the labor force. A comparative gap of note would be that college graduates were perceived to have better technical skills compared to the average ACNG.

Employer size was an important factor in the preferred model. The largest category of employer is positively associated with willingness to hire an ACNG. This matches the risk aversion model. The largest category of employer has lower risk, and in fact generates comparative advantage, when hiring from a high-variance pool of candidate quality.

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 own are associated with reduced willingness to hire. This specifically indicates a reduced penalty for lacking body language communication skills in the information technology industry. With less strength and more breadth, a positive coefficient to the interaction variable 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 naturally obtain a comparative advantage in this field.

4. Conclusion

This study provides evidence that skill signals are an important factor of hireability and are unique for the ACNG. Perceived skill gaps do a better job of explaining willingness to hire than do other widely recognized effects including industry and state effects. Employer factors better explain candidate hireability 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 rulebreakers 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[13]. 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.

The preferred model explains about one third of willingness to hire. 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. This study uses a cross-sectional analysis to investigate a subject that varies over time. The traditional system of accredited undergraduate education was itself at one time an innovation. Dynamic analysis would yield deeper understanding of such trends, achieve greater explanatory power, and provide better casual understanding. Other research has conducted some dynamic analysis of the same dependent variable with different regressors[14]. Integrated analysis would be useful for replication and the generation of new models of better explanatory power. Specifications that allow for overqualification effects and heterogeneous nonlinear relations between skill gaps and

hireability would improve not only the present paper, but the state of the art in skill gap analysis.

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 demonstrates plausible misalignment of perceived and actual skill in some cases. Last mile training is a type of alternative education which has been specifically recommended as a remedy for technical skill gaps among recent college graduates. It is surprising that the average recent college graduate in the sample is perceived to have better technical skill compared to the average ACNG.

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.

References

[1] K. B. McGarry, An examination of perceived employability skills between employers and college graduates, Northeastern University, 2016.

[2] G. Malik, A. Venkatraman, "the great divide": skill gap between the employer's expectations and skills possessed by employees, Industrial and Commercial Training (2017).

[3] F. K. Abbasi, A. Ali, N. Bibi, Analysis of skill gap for business graduates: managerial perspective from banking industry, Education+ Training (2018).

[4] Y. Gingras, R. Roy, Is there a skill gap in canada?, Canadian Public Policy/Analyse de politiques (2000) S159–S174.

[5] M. Smith, Spotlight on research: The distributional impact of unemployment (2011).
URL https://www.philadelphiafed.org/community-development/publications/cascade/77/07_distributional-impact-of-unemployment

[6] B. Caplan, The case against education: Why the education system is a waste of time and money, Princeton University Press, 2018.

[7] G. Symon, C. Cassell, Neglected perspectives in work and organizational psychology, Journal of Occupational and Organizational Psychology 79 (3) (2006) 307–314.

[8] J. Brown, M. Kurzweil, The complex universe of alternative postsecondary credentials and pathways, American Academy of Arts and Sciences Cambridge, MA, 2017.

[9] F. Green, S. McIntosh, Is there a genuine under-utilization of skills amongst the over-qualified?, Applied Economics 39 (4) (2007) 427–439.

[10] M. Raybould, H. Wilkins, Over qualified and under experienced, International journal of contemporary hospitality management (2005).

[11] D. Blake, Skills quotient: The solution to the ceo's biggest problem (Oct 2018).
URL https://blog.degreed.com/skills-quotient-solution-ceos-biggest-problem/

[12] P. L. Curşeu, R. Ilies, D. Vîrgă, L. Maricuţoiu, F. A. Sava, Personality characteristics that are valued in teams: Not always "more is better"?, International Journal of Psychology 54 (5) (2019) 638–649.

[13] J. Arabia, Survey: What do young americans really think about trade school? (Feb 2019).
URL https://www.bigrentz.com/blog/trade-school-survey

[14] J. Vandivier, Preliminary attitudinal trends in alternative postsecondary learning, Applied Economics Letters (2020) 1–4.