

CEO Cognitive Complexity and Acquisition Behavior

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Abstract

CEO cognitive complexity is an essential dimension of CEO cognition style. We use a sample of S&P 1500 firms from 2008-2016 to examine the relationship between CEO cognitive complexity and acquisition behavior. Specifically, we employ quarterly earnings conference call LIWC software to calculate CEO cognitive complexity score, and we obtain acquisition number and value from SDC platinum. In the context of acquisitions, we find that CEO cognitive complexity is positively associated with the number of acquisitions, by contrast, CEO cognitive complexity is negatively related to the transaction value of acquisition. Our findings contribute to a more complete understanding of the role of CEO cognitive complexity in firms' acquisition behavior.

Keywords

CEO Cognitive Complexity; Acquisition Number; Acquisition Value.

1. Introduction & Literature Review

Prior research has examined diverse CEO motives for acquisitions, which are value enhancing or value destroying. On the one hand, the separation of ownership and control leads to many potential conflicts of interest between shareholders and top managers (Avery, 1998). From agency theory, CEOs will conduct self-interested behaviors at the expense of shareholders. Thus, CEOs would like to acquire other firms to "build their empires" in order to improve shareholders' monitoring costs and their own managerial entrenchment. Avery (1998) examined two ways in which private benefits could accrue to managers from undertaking acquisitions. First, it has been suggested that managers may be able to increase their compensation by increasing the sizes of their firms. Second, managers may be able to increase their prestige or standing in the business community by purchasing other firms. Therefore, we conclude that agency costs are a significant driver of CEOs' empire building through acquisition deals.

On the other hand, some CEOs are more confident in acquisition. They believe this acquisition could bring about long-term value to the firm and benefit for their shareholders. Halebian (2009) argued the value creating acquisitions could lead to a valuable combination of assets, market power gains, or efficiency improvements. Rabier (2017) examined two major value creating ways in acquisition: financial synergies and operating synergies. Rabier (2017) argue that if acquisition deal is driven by financial synergies, then it will create value through financial structure combinations between the acquirer and target firm, by contrast, the potential value enhancement of acquisition deal driven by operating synergy are from economies of scale and scope (Walter & Barney, 1990), revenue-enhancements (Ahuja & Katila, 2001; Hoberg & Phillips, 2010) and reduced competition in the market (Chatterjee, 1986).

As we discussed above, acquisition is a significant strategic decision for the company, from upper echelons theory, we know that CEO is the person who mainly decide acquisition in the firm. Previous research has examined the influence of individual attributes on acquisition behaviors, such as demographic factors, psychological attributes, leader experience and capabilities, and risk propensity (Devers et al., 2020). Firstly, some researchers found CEO demographic factors will have an impact on acquisition behaviors, including CEO age, gender, if CEO is a founder, professional experience etc. (Matta & Beamish, 2008; Huang & Kisgen, 2013). Secondly, there are several studies examine the relationship between CEO psychological attributes and acquisition, which are CEO narcissism, overconfidence, extraversion, and promotion orientation positively influences both the amount and boldness of acquisitive behavior (Gamache et al., 2015; Malhotra et al., 2018; Malmendier & Tate, 2008). Finally, CEOs' social networks and comparisons are also drivers of acquisition. This research shows that the acquisition actions and targets CEOs pursue are partially driven by their social connections (Devers et al., 2020; Cohen, Gurun, & Malloy, 2017; Rousseau & Stroup, 2015; Shue, 2013).

Apart from we discussed above, some scholars have examined the importance of CEO cognitive style. Cognitive style refers to how a person conducts information gathering and information processing. Chester Barnard was the first person to address the different types of CEO's thought process. Schneier (1979) view cognitive style is through the construct of "cognitive complexity". Finkelstein, Hambrick & Cannella (2009) proposed that cognitively simple individuals see each conceptual category in black-and-white terms because they carry relatively few conceptual categories in their minds and they have parsimonious mental linkages among categories. In contrast, Finkelstein, Hambrick & Cannella (2009) also proposed cognitively complex individuals, conversely, carry many conceptual categories, which they view as intricately interconnected.

In the previous research, Wally and Baum (1994) found that a factor consisting of cognitive complexity and amount of education was positively associated with the speed at which executives evaluated acquisition candidates. Furthermore, Finkelstein, Hambrick & Cannella (2009) proposed that CEO cognitive complexity could lead to quicker complex information processing. In addition, Graf-Vlachy (2020) examined the two dimensions about CEO cognitive complexity: differentiated (as opposed to unitary) and nuanced (as opposed to black-and-white) thinking. Graf-Vlachy (2020) developed CEO cognitive complexity through text analysis by using earnings conference call transcripts. Graf-Vlachy (2020) argue that CEO with longer tenures demonstrate greater role-specific expertise, which in turn allows greater complexity of thought (Simon & Chase, 1973), by contrast, new CEOs are more likely to simplify the current situation (Hambrick & Fukutomi, 1991) because they are confronted with an abundance of unfamiliar and unstructured information. Then, Graf-Vlachy (2020) find that CEOs tend to become cognitively more complex as their tenures advance. Thus, although few studies until now have examined CEO cognitive complexity, we still think it will be an important concept of theoretical and practical importance.

In this paper, we introduce CEO cognitive complexity into acquisition decision, we would like to fill the gap: Will CEO cognitive complexity have an influence on firm acquisition behaviors? We argue that CEO cognitive complexity will be positively associated with the number of acquisitions, however, CEO cognitive complexity will be negatively associated with the transaction value of acquisition. We link CEO cognitive complexity with acquisition decisions together. We contribute to upper echelons theory, cognitive complexity and M&A literatures.

2. Propositions

We propose that lower CEO cognitive complexity will lead to higher transaction value of acquisition. It has often been argued that higher levels of cognitive complexity of CEOs are

required to achieve superior firm performance (Calori et al., 1994). Managerial cognitive complexity has primarily assumed that higher cognitive complexity is more beneficial to the firm (Dow, Cuypers, & Ertug, 2016) because high cognitive complexity allows managers to detect and combine informational cues more effectively. CEO with low cognitive complexity is essentially compelled to greatly simplify (Hambrick & Fukutomi, 1991)

Acquisition decision generally are characterized by complexity and ambiguity (Duhaime & Schwenk, 1985). Because acquisition decision is complex, ambiguous and lack of structure, then CEO information processing limitation might affect the decision process (Duhaime & Schwenk, 1985). We argue that CEO low cognitive complexity will simplify the acquisition decision, and then overestimate the value of acquisition deal. First, from the cognitive perspective, low cognitive complexity CEOs tend to simplify decision processes and focus on factors that they understand and have past experiences. CEO with low cognitive complexity would have limitations in cognition. Thus, they might neglect potential risks of the acquisition deal and then overestimate the value of target firm. Second, from the motivational perspective, simplification process could reduce anxiety associated with uncertainty. Thus, overestimating the value of target firm will help CEO reassure their decision and reduce the anxiety they face. We argue that CEO with lower cognitive complexity will overestimate the acquisition deal, thus, lower cognitive complexity CEO will lead to greater transaction value of acquisition. Therefore, we hypothesize:

Proposition 1: CEO cognitive complexity will be negatively associated with the transaction value of acquisition.

In addition, we propose that CEO with higher cognitive complexity have more information and motivation to pursue acquisition deals. CEO with high cognitive complexity could comprehend and integrate more frameworks when making decisions (Van Seggelen-Damen, 2013) and are better equipped to adapt to environmental changes (Bogner & Barr, 2000). High CEO cognitive complexity could drive broader and more extensive strategic change (Wangrow et al., 2019). We argue that CEOs with high cognitive complexity also prefer intensive acquisition activities because of their sufficient information and motivation.

Furthermore, CEO who undertakes acquisitions will obtain more outside directorships than their peers (Avery et al., 1998). CEOs will gain connections, skills, and experience through acquisitions, and acquisition is a good signal for CEO's ability to manage a large and diverse company (Avery et al., 1998). Thus, CEOs have more opportunities and desires to become a board member with acquisition. CEOs can increase their prestige and standing in the business community by undertaking acquisitions (Avery et al., 1998). We propose that high cognitive complexity CEO will conduct more acquisition in terms of more information, experiences and desires to become a board member. In sum, we argue high CEO cognitive complexity is positively related to the number of acquisitions. Therefore, we hypothesize:

Proposition 2: CEO cognitive complexity will be positively associated with the number of acquisitions.

3. Data & Sample

We collected data in several steps for this sample selection process. First, we downloaded U.S. domestic acquisition deals from SDC platinum database and excluded "leveraged buyouts, spinoffs, recapitalizations, self-tenders, repurchases, acquisitions of remaining interests, privatizations, minority stake offers" following (Cuypers et al., 2017). We only kept complete

deals. Second, we constrained our acquirer firm to S&P 1500 list. We matched acquisition deals with firm level data through Compustat, and merged them with CEO level data through Execucomp. Third, we collected quarterly earning conference call transcripts from Factiva and extracted question-and-answer portions from every transcript. Then, we used LIWC software to calculate CEO complexity score using quarterly earning conference call transcripts. Finally, we obtained our final sample of 2836 M&A deals conducted by 906 acquirers from 2008 to 2016.

4. Measurements

Independent variables. *CEO complexity.* We followed Graf-Vlachy (2020)'s method to calculate CEO cognitive complexity score. We measured CEO cognitive complexity by examining CEOs' language patterns in the question-and-answer (Q&A) portions of quarterly conference calls (Graf-Vlachy et al., 2020). During the earnings conference call, analysts might ask unexpected questions to CEO (Chen & Matsumoto 2006), so CEO will answer analysts' questions directly without polishment or rehearsal. Thus, CEOs' answers in Q&A portion could reflect their real cognitive processes. We calculated "The Language of Differentiation", "The Language of Nuance", and "The Language of Comparison" using earnings conference call transcripts and LIWC software. Lastly, we standardized and averaged the three items to compute a CEO's cognitive complexity score for each quarter t (Graf-Vlachy et al., 2020).

Dependent variables. *Number of acquisitions.* We calculated number of acquisitions of every firm completed each year from the SDC platinum. *Transaction Value of acquisition.* We measured the transaction value of acquisition as reported in the SDC platinum. The transaction value of acquisition was log transformed because it was highly skewed.

Control variables. First, we controlled several CEO-level variables. We collected CEO-level variables from Execucomp database. *CEO gender.* We generated CEO gender is equal to 1 if CEO is male, and "0" otherwise. *CEO duality.* If CEO served as a director during the fiscal year. We controlled *CEO age* and *CEO tenure* downloaded from Execucomp. we also controlled CEO big five personality (*CEO conscientiousness, CEO agreeableness, CEO extraversion, CEO neuroticism, CEO openness*) using R's machine-learning capabilities. We controlled CEO regulatory focus (*CEO promotion focus* and *CEO prevention focus*) using LIWC software.

Second, we also controlled several acquirer firm-level variables. First, We controlled *acquirer size* calculated by taking the logarithm of total assets, *acquirer free cash flows* using acquirer's net operating cash flows in the year prior to the acquisition announcement, and *acquirer age* by calculating the differences between the announcement year and the first year that the acquirer was recorded in Compustat (Rabier, 2017). Second, we controlled *acquirer experience* which is the total number of previous acquisition that acquirer firm had made. Third, we controlled *acquirer performance* using industry-adjusted ROA (acquirer ROA subtracts the median ROA of acquirer's industry) in the year prior to the acquisition announcement (Campbell et al., 2016). Forth, we measured *acquirer leverage* using the debt-to-equity ratio of acquirer by dividing the total liabilities by the total stockholders' equity in the year prior to the acquisition announcement (Campbell et al., 2016). Fifth, we controlled *public target* which is "1" if the target company is public, and otherwise "0".

Finally, we also controlled for several acquisition deal level variables. First, we controlled *friendliness* which is "1" if the deal attitude is "friendly", and "0" otherwise. Second, we controlled acquirer and target firm *relatedness* by using four-digit SIC codes of acquirer and target. We assigned a score of 4 if the core businesses of the acquiring and target firms share the exact same four-digit SIC code, 3 if they share only the first three digits of their SIC codes, 2 if they share only the first two digits, 1 if they share only the first digit, and 0 if they share none (Campbell et al., 2016). We also controlled *geographic proximity* and coded it as "1" if the

acquirer and the target's header quarters are in the same region, and "0" otherwise. We further controlled acquisition payment method *all cash*, *all stock* and *hybrid* respectively which are all dummy variables. Finally, we also controlled for the *financial crisis* and coded deals that took place in 2008 and 2009 as "1", "0" otherwise.

5. Results

Table 1 and Table 2 demonstrate the descriptive analysis of our two samples. The dependent variable of Table 1, Table 2 and Table 5 is the logarithm of acquisition transaction value. The dependent variable of Table 3, Table 4 and Table 6 is the number of acquisitions. We also ran two regression models to test our hypotheses. First, we used linear regression model to test the relationship between CEO cognitive complexity and the acquisition transaction value. second, we also tested the relationship between CEO cognitive complexity and the number of acquisitions using negative binomial regression model. In Table 5, the coefficient of CEO cognitive complexity is -0.177(p-value <0.05), and in Table 6, the coefficient of CEO cognitive complexity is 0.083 (p-value <0.05). We found strong support for our hypotheses: CEO cognitive complexity is negatively related to the transaction value of acquisition. CEO cognitive complexity is positively related to the number of acquisitions.

6. Discussion and Future Research

Our paper examines the impact of CEO cognitive complexity on acquisition behavior. We hope our findings could shed light on the research regarding CEO cognitive complexity and M&A. We contribute both to upper echelons theory and M&A literature in this study. We plan to conduct more analysis to address the limitations of current study. First, we are going to employ more regression models to test the causal relationship, and we will include more robustness test to make sure our results are valid and reliable. Second, we also would like to find out more moderating effects of our hypotheses. Finally, we encourage future scholars could conduct more research on CEO cognitive style and the influence on firm strategic decision, because the cognitive style of top managers plays a very import role in firm strategic decision.

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Appendix

Table 1. Descriptive Statistics (DV: log of acquisition transaction value)

Variable	Obs	Mean	Std. Dev.	Min	Max
Transaction value	2836	5.002	1.948	.01	11.89
CEO cognitive complexity	2032	.066	.427	-1.241	1.641
CEO conscientiousness	2120	5.15	.451	3.63	6.51
CEO agreeableness	2120	4.132	.763	1.317	6.946
CEO extraversion	2120	4.873	.874	1.849	7
CEO neuroticism	2120	3.29	.602	1.167	6.209
CEO openness	2120	4.75	.565	2.681	6.268
CEO promotion focus	2120	2.474	.804	0	7.4
CEO prevention focus	2120	.463	.503	0	6.156
CEO age	2119	55.69	6.854	29	79
CEO duality	2646	.954	.21	0	1
CEO gender	2646	.979	.144	0	1
Relatedness	2836	1.97	1.603	0	4
Geographic proximity	2836	.045	.208	0	1
Acquirer experience	2836	8.445	11.288	0	116
Acquirer age	2836	27.199	18.687	1	125
Acquirer leverage	2836	2.342	14.683	-318.717	241.637
Acquirer size	2836	8.171	1.825	1.665	14.598
Acquirer performance	2836	.059	.134	-1.634	1.855
Free cash flow	2733	5.649	1.89	-.319	11.711
Public target	2836	.315	.465	0	1
Friendliness	2836	.978	.146	0	1
All cash	2836	.468	.499	0	1
All stock	2836	.042	.201	0	1
Hybrid	2836	.131	.338	0	1
Financial crisis	2836	.176	.381	0	1

Table 2. Pairwise correlations (DV: log of acquisition transaction value)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	
(1) Transaction value	1.000																										
(2) CEO cognitive complexity	-0.120	1.000																									
(3) CEO conscientiousness	0.005	-0.136	1.000																								
(4) CEO agreeableness	0.075	-0.107	0.516	1.000																							
(5) CEO extraversion	0.097	-0.105	0.349	0.691	1.000																						
(6) CEO neuroticism	-0.088	0.143	-0.547	-0.799	-0.787	1.000																					
(7) CEO openness	0.023	-0.086	0.702	0.823	0.545	-0.711	1.000																				
(8) CEO promotion focus	-0.068	-0.081	0.190	0.104	0.160	-0.135	0.119	1.000																			
(9) CEO prevention focus	0.030	-0.171	0.064	0.041	0.112	-0.096	0.004	0.006	1.000																		
(10) CEO age	0.080	0.004	-0.074	-0.198	-0.195	0.146	-0.201	-0.059	0.032	1.000																	
(11) CEO duality	0.037	-0.028	-0.052	0.031	0.080	-0.061	-0.005	0.017	0.052	-0.110	1.000																
(12) CEO gender	-0.065	0.120	-0.052	-0.029	-0.006	0.028	-0.025	-0.044	-0.020	0.025	-0.020	1.000															
(13) Relatedness	0.120	-0.008	0.026	0.010	0.080	-0.094	-0.033	0.048	0.060	0.005	0.060	0.010	1.000														
(14) Geographic proximity	0.153	-0.006	-0.041	0.007	-0.031	-0.008	-0.031	-0.062	0.008	0.053	-0.012	-0.018	0.026	1.000													
(15) Acquirer experience	0.041	0.023	0.033	0.158	0.052	-0.018	0.141	-0.017	0.093	0.139	-0.020	0.002	-0.126	-0.014	1.000												
(16) Acquirer age	0.247	-0.064	-0.009	0.014	0.105	-0.047	-0.130	0.021	0.013	0.157	0.040	-0.053	0.019	0.037	0.109	1.000											
(17) Acquirer leverage	0.065	0.039	0.049	0.005	0.062	-0.054	0.055	0.025	0.018	0.014	-0.003	0.002	0.042	0.008	-0.006	0.013	1.000										
(18) Acquirer size	0.551	-0.135	0.116	0.048	0.150	-0.116	0.034	-0.108	0.160	0.150	-0.037	-0.081	0.052	0.105	0.276	0.417	0.089	1.000									
(19) Acquirer performance	0.071	-0.079	0.128	0.342	0.164	-0.342	0.188	0.008	0.016	0.017	0.060	0.021	0.092	0.007	0.020	0.076	-0.050	0.001	1.000								
(20) Free cash flow	0.555	-0.123	0.053	0.189	0.217	-0.191	0.081	-0.141	0.089	0.137	-0.020	-0.084	0.045	0.096	0.249	0.441	0.061	0.891	0.144	1.000							
(21) Public target	0.402	-0.098	-0.022	0.037	0.081	-0.085	-0.018	-0.058	0.038	0.033	0.001	-0.073	0.106	0.322	-0.038	0.158	0.060	0.295	0.026	0.284	1.000						
(22) Friendliness	-0.142	-0.014	0.000	-0.023	-0.044	0.040	-0.002	0.042	-0.023	0.001	-0.010	-0.005	-0.054	-0.002	0.040	-0.023	-0.100	-0.047	0.000	-0.066	-0.080	1.000					
(23) All cash	0.055	-0.029	0.014	0.222	0.202	-0.198	0.107	0.030	0.011	0.032	0.060	0.013	-0.003	-0.018	0.052	0.050	-0.010	0.018	0.098	0.089	0.046	-0.019	1.000				
(24) All stock	0.114	-0.011	0.042	-0.096	-0.007	0.013	-0.024	0.029	0.071	0.006	-0.009	0.004	0.134	0.097	-0.026	0.021	0.044	0.086	-0.050	-0.005	0.174	-0.028	-0.197	1.000			
(25) Hybrid	0.168	0.014	0.034	-0.052	0.021	-0.010	-0.012	0.088	0.003	-0.054	0.012	0.003	0.115	0.040	-0.077	-0.040	0.001	-0.016	-0.018	-0.050	0.038	-0.013	-0.364	-0.082	1.000		
(26) Financial crisis	-0.068	0.007	-0.016	0.090	0.110	-0.098	0.031	-0.030	0.015	-0.125	0.009	0.022	0.047	0.019	-0.040	0.004	-0.017	-0.001	0.052	0.040	0.070	-0.083	0.019	0.009	-0.039	1.000	

Table 3. Descriptive Statistics (DV: number of acquisition)

Variable	Obs	Mean	Std. Dev.	Min	Max
Number of acquisitions	2133	1.33	.83	1	12
CEO cognitive complexity	1575	.048	.427	-1.241	1.641
CEO age	1643	55.604	6.703	29	79
CEO tenure	1610	7.34	6.189	0	39
CEO duality	2006	.959	.199	0	1
CEO gender	2006	.977	.15	0	1
Acquirer experience	2133	7.203	9.448	0	116
Acquirer age	2133	28.191	18.787	1	125
Acquirer leverage	2133	2.288	12.142	-318.717	241.637
Acquirer size	2133	8.229	1.82	1.665	14.598
Acquirer performance	2133	.061	.137	-1.634	1.855
Financial crisis	2133	.184	.387	0	1

Table 4. Pairwise correlations (DV: number of acquisition)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Number of acquisition	1.000											
(2) CEO cognitive complexity	0.073	1.000										
(3) CEO age	0.023	0.014	1.000									
(4) CEO tenure	0.027	0.120	0.313	1.000								
(5) CEO duality	-0.038	-0.020	-0.100	0.037	1.000							
(6) CEO gender	0.019	0.119	0.017	0.054	-0.015	1.000						
(7) Acquirer experience	0.214	0.019	0.113	0.116	0.010	-0.007	1.000					
(8) Acquirer age	-0.085	-0.041	0.156	-0.054	0.024	-0.059	0.142	1.000				
(9) Acquirer leverage	0.007	0.016	0.001	-0.025	-0.007	-0.002	0.005	0.021	1.000			
(10) Acquirer size	-0.051	-0.138	0.139	-0.059	-0.042	-0.085	0.276	0.394	0.097	1.000		
(11) Acquirer performance	-0.023	-0.065	0.015	-0.023	0.053	0.029	0.022	0.040	-0.049	-0.039	1.000	
(12) Financial crisis	-0.034	0.026	-0.116	-0.060	-0.017	0.026	-0.039	-0.011	-0.017	-0.009	0.031	1.000

Table 5. Linear Regression Results (DV: log of acquisition transaction value)

VARIABLES	(1)	(2)
CEO cognitive complexity		-0.177** (0.080)
CEO tenure	-0.018*** (0.006)	-0.019*** (0.006)
CEO conscientiousness	-0.255** (0.114)	-0.354*** (0.115)
CEO agreeableness	0.263** (0.103)	0.193* (0.107)
CEO extraversion	-0.162*** (0.062)	-0.140** (0.063)
CEO neuroticism	0.205* (0.118)	0.187 (0.122)
CEO openness	0.166	0.278**

	(0.125)	(0.125)
CEO promotion focus	-0.040	-0.051
	(0.042)	(0.043)
CEO prevention focus	-0.102*	-0.153**
	(0.061)	(0.068)
CEO age	0.007	0.006
	(0.005)	(0.005)
CEO duality	0.217	0.234
	(0.162)	(0.162)
CEO gender	-0.115	-0.043
	(0.254)	(0.268)
Relatedness	0.038*	0.039*
	(0.022)	(0.023)
Geographic proximity	-0.026	-0.014
	(0.174)	(0.178)
Acquirer experience	-0.016***	-0.015***
	(0.003)	(0.003)
Acquirer age	-0.002	-0.003
	(0.002)	(0.002)
Acquirer leverage	0.001	0.002
	(0.002)	(0.002)
Acquirer size	0.089	0.094*
	(0.055)	(0.056)
Acquirer performance	-0.160	-0.197
	(0.268)	(0.272)
Free cash flow	0.463***	0.470***
	(0.054)	(0.055)
Public target	0.891***	0.865***
	(0.078)	(0.079)
Friendliness	-1.345***	-1.242***
	(0.215)	(0.219)
All cash	0.466***	0.465***
	(0.075)	(0.076)
All stock	1.182***	1.181***
	(0.217)	(0.220)
Hybrid	1.225***	1.213***
	(0.123)	(0.124)
Financial crisis	-0.313*	-1.160***
	(0.162)	(0.172)
Year	Controlled	Controlled
Industry	Controlled	Controlled
Constant	1.617	2.616**
	(1.053)	(1.098)
Observations	2,027	1,943
R-squared	0.473	0.474

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 6. Negative Binomial Regression Results (DV: number of acquisition)

VARIABLES	(1)	(2)
CEO cognitive complexity		0.083** (0.038)
CEO age	0.001 (0.002)	-0.000 (0.002)
CEO tenure	-0.002 (0.002)	-0.001 (0.002)
CEO duality	-0.069 (0.126)	-0.095 (0.130)
CEO gender	0.075 (0.075)	0.060 (0.078)
Acquirer experience	0.010*** (0.002)	0.010*** (0.002)
Acquirer age	-0.001 (0.001)	-0.001 (0.001)
Acquirer leverage	0.002** (0.001)	0.002** (0.001)
Acquirer size	-0.019* (0.010)	-0.015 (0.010)
Acquirer performance	0.110 (0.076)	0.112 (0.077)
Financial_crisis	0.097* (0.053)	0.095* (0.055)
Year	Controlled	Controlled
Industry	Controlled	Controlled
Constant	0.248 (0.243)	0.309 (0.245)
Observations	1,610	1,544

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 7. Summary of Three Dictionaries Used to Assess CEO Cognitive Complexity

Dictionary	The Language of Differentiation	The Language of Nuance	The Language of Comparison
Conceptual Definition	Language that draws distinctions or describes contrasts	Language that conveys degrees of (non-) certitude regarding likelihoods of outcomes or actions	Language that establishes ordering among objects or makes comparisons between them, but without absolutism
Source	LIWC 2015 – “differentiation” dictionary	Loughran and McDonald (2011) – “weak” and “strong” modal word dictionaries (2014 version), combined with LIWC 2015 – “tentative” and “certainty” dictionaries	Comparative words extracted from our corpus of text, supplemented by comparatives from Brown University Standard Corpus of Present-Day American English (1979) and the Open American National Corpus (n.d.)
Example Words	But, except, however (total 81 words)	Weak: Could, might, possibly, apparently, seems (total 180 words)	Better, earlier, lower, harder (total 269 words)
		Strong: Always, will, must, purely, totally (total 123 words)	
Measure	Number of differentiation words divided by total number of words	Number of weak words divided by sum of weak and strong words	Number of comparison words divided by total