



CEOs' online personality and their company's business strategy: openness to experience predicts diversifying merger and acquisition decisions

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Abstract

As a personality trait, openness to experience plays a central role in driving behaviors associated with exploration and innovation. Despite decades of extensive research, the expression of openness to experience in business strategy remains understudied. The current study addresses this gap by revealing that the openness in experience perceived from American and Chinese CEOs' social media predicted their firm's initiation of diversifying M&As, even after controlling for an extensive set of potential confounds. By replicating our findings across two culturally distinct samples, we highlight the role of openness in corporate strategic decision-making, and the usefulness of social media as a source for personality assessment.

Keywords Personality · CEO · Decision making · Corporate strategy · Social media · Corporate executives

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1 Introduction

A hallmark of the human success story is our capacity to overcome worries about uncertainty, venture into the unknown, and reap the benefits of exploratory behavior. Openness to experience (hereafter openness) is a personality trait that enables us to achieve such feats by turning our fear of the unknown into one of adventure. Existing literature on openness has shown how trait openness differs among individuals varying in, for example, social and political attitudes [1–3], intelligence and knowledge [4–5], and wellbeing [6–7]. Although this body of work is informative about the correlates of openness, they have relied on self-reports while the real-world behavioral expression of openness remains relatively underexplored [8]. Only a handful of studies, have shown that openness can predict creative achievements [9], vocational pathways [10–11], and how offices and bedrooms are organized [12] in the real world.

The business domain offers another promising platform to demonstrate real-world expression of openness, but this research direction has been largely neglected. Considering the perennial importance of understanding how firms can remain competitive, substantial interest exists over the factors that influence the strategic decision-making of corporate executives [cf., 13]. In turn, how corporate executives make business decisions may also provide a useful means to explore the ways that openness manifests in actions that carry significant practical implications. One corporate strategy that is especially relevant to openness is mergers and acquisitions (M&As) given that they involve a substantial amount of uncertainty and exploration [14–15]. In particular, diversifying M&As, where a company takes a controlling interest in a highly dissimilar company (e.g., in a different industry, market, or culture), are especially exploratory and innovative, and hence allows us to strongly observe openness at work. By examining corporate executives' initiation of diversifying M&As as an expression of openness, several research objectives—such as an expansion of the literature on personality expression in the business domain and an improved understanding of the psychological antecedents of diversifying M&As—can be achieved in tandem.

Acquiring data on corporate executives' personality is known to be difficult due to the obtrusiveness of personality surveys and the reluctance of busy corporate executives, particularly those from publicly listed firms, to respond to such surveys [16]. Considering that the use of social media platforms has grown tremendously in recent years and many executives from large publicly listed firms have set up their personal accounts, an opportunity exists to assess corporate executives' personality traits through their personal activities and opinions expressed on social media [17]. It is important to note that while this approach is feasible in theory, accurate personality data may still be elusive because corporate executives may try to portray themselves in ways that promote favorable public relations rather than their true selves [cf., 17], and some of their messages could even be written by hired guns. However, even if the social media accounts of corporate executives are managed by public relations professionals, messages are likely to be approved by those corporate executives before they get published, so the social media activities presented should still match their goals and preferences and thus reflect their personality to some extent. At the very least, even if corporate executives' social media do not accurately reflect their true

personality, it would still be valuable to learn how the personality portrait of corporate executives in social media is linked to their companies' business strategy. Therefore, the present study sought to examine if openness judged from corporate executives' social media could predict their company's initiation of diversifying M&As.

1.1 Social media and personality

Research has shown that zero-acquaintance observers can accurately predict others' personality from their social media. For example, Back et al. [18] showed that observers could predict Facebook users' degree of extraversion, conscientiousness, agreeableness, and openness from their Facebook profiles. Qiu et al., [19] showed that observers could predict social media users' degree of openness from their selfies. The reason why social media based personality judgement can be accurate is because social media contain digital footprints such as linguistic cues that reflect personality traits [20–22]. For example, extraverts tend to use more social process words in their posts on tweets [23] and Weibo, a Chinese microblogging platform similar to Twitter [24]. This echoes past research showing that people inadvertently leave personality-related behavioral residue in their physical and virtual environments [e.g., 12, 25]. As people frequently use social media outlets to express their thoughts and activities, social media affords an alternative to otherwise hard-to-obtain direct measures of personality.

Several studies have applied machine learning to predict personality traits from social media [26–27]. They showed that even simple Facebook “likes” can be used to predict a wide range of individual difference attributes including personality, attitudes, and intelligence [28], and computer-based personality judgments could be more accurate than human judgments [29]. Computer-generated personality has been used in areas such as personalized advertisement [30], personality profiling of superstar entrepreneurs [31], and personality-based career matching [32]. While these studies attest to its usefulness in personality assessment, especially for large-scale samples, there are two difficulties in applying it. First, to develop a machine learning model, one needs a large dataset, usually including a large sample (around a thousand) of users' self-report personality and their social media, to train the machine learning model before applying it to the target dataset. This makes it very difficult to build one's own machine learning model. Second, existing models that have been used in previous studies, such as the IBM Watson Personality Insights (which has been discontinued) or Receptiviti (www.receptiviti.com), are often proprietary. It is difficult to assess their reliability, especially when the training data source is difficult from the target data source. For example, how well will the model perform, when its training dataset is from Facebook while the target dataset is from Twitter? Therefore, in this study, we relied on human raters to predict personality traits from social media.

1.2 Openness to experience and corporate strategy

Openness to experience is a fundamental personality trait in the Big Five personality model [33–34]. While conceptualizations of openness have evolved to some extent [cf., 35], there is considerable agreement that it reflects an “interest in varied experi-

ence for its own sake” [10, p. 1259]. Costa and McCrae [36] proposed six aspects of life to which individuals may be relatively more open or closed: fantasy, aesthetics, feelings, actions, ideas, and values. Openness has been delineated further in terms of its experiential aspects, such as an appreciation for aesthetics, openness to emotions and sensations, indulgence in fantasy, and engagement with perceptual and sensory information, as well as its intellectual aspects, such as curiosity, enjoyment of philosophy, and engagement with abstract and semantic information [37]. High scorers on openness tend to be imaginative and artistic, attentive to their own feelings, willing to try new activities, intellectually curious, and unconventional. These aspects have both motivational and structural components [38]. Motivationally, open individuals are receptive to new experiences as well as a deeper examination of their own thoughts, feelings, and values. Structurally, open individuals have a permeable style of consciousness in which remote associations are easily made. In contrast, closed individuals are more comfortable with what they are already familiar with and tend to compartmentalize their ideas and feelings [39]. Overall, open individuals are more likely to create and explore new ideas, whereas closed individuals are less willing to accept new ideas [10].

A range of corporate strategies are at the disposal of firms striving for competitive advantage, of which M&As are one such strategy. In M&As, two or more firms agree to irreversibly fuse their resources and operations to become one legal entity, thereby allowing these firms to expand market parameters, boost innovative capacities, and/or create economies of scope or scale via access to commercially viable infrastructure that would otherwise be unavailable [40]. The pursuit of M&As is associated with several challenges including the exploration of feasible firms to integrate with under conditions of uncertainty and the implementation of new processes and value systems to facilitate integration [41–42].

While neoclassical efficient market principles imply that M&As are initiated only after rational assessment of target entities’ circumstances [43–44], other perspectives point to the role of psychological precursors in strategic decision-making. For instance, corporate executives’ perceptions of success in previous M&As has been documented to influence future M&A decisions, and this effect is higher for more experienced executives [45]. Other studies have demonstrated that psychological factors such as self-attribution bias, exaggerated self-importance, and narcissism can lead to overconfidence and hubris, which in turn may spur the initiation of (often overambitious and thus suboptimal) M&As [46–49]. Age, an individual difference factor that has important psychological implications, has also been identified as a key predictor of the initiation of M&As because corporate executives have stronger financial incentives to pursue M&As early in their career [50]. While above studies suggest that individual characteristics of corporate executives have influences on their company’s M&As, the investigation of the connection between corporate executives’ personality and the decision to M&A has, however, been scarce.

To fill the research gap, in this study, we focused on diversifying M&As, which we refer to firms’ cross-industry M&As based on Fama and French’s [51] industrial classification. There are two reasons why we chose to examine diversifying M&As. First, diversifying M&As require a company to step out of its comfort zone and dive into a different industry [52–55]. They entail a substantial degree of exploration but

promise the possibility of business expansion, the formation of new corporate partnerships, and improvements in innovative capacities [40]. They may be perceived as an opportunity for novelty, change, discovery, and learning by open corporate executives, and therefore are likely to be an expression of openness in business decisions. Second, a limited number of studies suggest that both openness and extraversion of corporate executives predict initiation of strategic change [e.g., 56–57]. However, it is unclear how these two traits differ in their role in the business process. It is possible that openness predicts strategic change because open corporate executives are interested in exploring new partnerships and innovative ideas, whereas the link between extraversion and strategic change can be explained by extraverts' high levels of optimism, confidence, and enthusiasm in the pursuit of new adventures. Given that diversifying M&A (compared to non-diversifying M&A) is a particular strategic change that, besides being risky, features entering into new territories and exploring new connections, we aimed to use its link with openness (after controlling for extraversion) to unveil the unique contribution of openness in business strategy.

2 The current study

The current study sought to examine if the openness perceived from CEOs' social media would predict the likelihood of their company's diversifying M&A decisions. We first identified Twitter and Weibo accounts for the CEOs of publicly listed U.S. and Chinese firms, respectively. Then, we collected social media from these accounts, and asked human raters to judge personality from these social media. Meanwhile, we collected information about the CEOs' and their firm's characteristics from existing business databases. Finally, we conducted regression analysis to test our predictions.

3 Method

The data and analysis codes for this paper are available at <https://osf.io/jtcks/>. Due to the exploratory nature of this study, the study and analysis plan was not pre-registered, and an *a priori* power analysis was not conducted.

3.1 CEO sample

We targeted the CEOs of firms that are publicly traded because M&A data are more readily available for publicly listed firms. While various social media platforms exist, we limited our scope to Twitter and Weibo because these two platforms are functionally similar and popular among US and Chinese CEOs, respectively. More importantly, the availability of two independent samples of firms and executives from substantially distinct institutional environments afforded an opportunity to test the robustness of our findings.

As there is no readily available list of Twitter or Weibo accounts for the CEOs of publicly listed firms, we identified our sample using the following systematic approach. For Twitter CEOs, we started with S&P Capital IQ's list of top executives

who have served in at least one of the following top executive positions in at least one publicly traded US firm as of the end of 2012: CEO, co-CEO, President, co-President, Top Key Executive, Chief Financial Officer, or Chairman of the Board. We determined whether a top executive in the Capital IQ list has a verified Twitter account using the following non-mutually exclusive methods. First, we used the Twitter search application programming interface to identify verified Twitter accounts whose names match the executives' names from the Capital IQ list, after which we manually checked the information disclosed in the matched Twitter accounts (e.g., names of disclosed current or former employers) against the executives' resume information posted on public companies' websites to determine the authenticity of the Twitter accounts. Second, we obtained top executives' verified Twitter accounts from several public sources¹. Third, we obtained a list of corporate executives' verified Twitter accounts compiled by Chen et al. [58]. We double-checked the accuracy of all the Twitter accounts identified from the second and third steps.

Next, we checked for the availability of data to compute firm-level variables. We excluded firms with more than one executive position holder (e.g., CEO and president) and firm-years where there was a change in CEO. These procedures resulted in a final sample of 42 unique Twitter CEO accounts representing 49 unique publicly traded firms. Using similar procedures, we identified a sample of 60 unique Weibo CEO accounts representing 61 unique publicly listed Chinese firms.

3.2 Personality judgments

We used Twitter API (<https://developer.twitter.com/en/docs/twitter-api>) and Weibo API (<https://open.weibo.com/wiki/API%E6%96%87%E6%A1%A3/en>) to retrieve the latest messages from the Twitter and Weibo accounts respectively. Following the data cleaning procedure in Qiu et al. [23], we removed messages that contained retweets, pictures, profile information (e.g., name, location, gender), and removed timestamps, geo-locations and embedded URLs in messages. If an account has more than 200 messages, we randomly selected 200 messages for rating. A total of 7,334 tweets were included in the Twitter sample. On average, each Twitter CEO had 174.62 messages ($SD=45.07$). A total of 9,741 weibo messages were included in the Weibo sample. On average, each Weibo CEO had 162.35 messages ($SD=51.42$).

Following previous social media-based personality judgment studies [e.g., 18], we asked zero-acquaintance raters to read the social media messages and provide personality ratings. Nine native English-speaking business major students from a large US public university were recruited to rate the Twitter sample, and eight native Chinese-speaking business major students from a large Chinese public university were recruited to rate the Weibo sample. The 44-item Big Five Personality Inventory [59] was used to rate the personality of Twitter users and its Chinese version² was used to rate the Weibo users. While our study focused on openness, raters rated both

¹ Top executives' verified Twitter accounts were obtained from <http://www.ceo.com/lists/ceos-that-tweet/>, http://images.businessweek.com/ss/09/05/0508_ceos_who_twitter/2.htm, <http://www.reuters.com/reuters-klout-50>, and <http://www.strategicobjectives.com/blog/the-ultimate-list-of-social-ceos-on-twitter/>.

² Retrieved from <https://www.ocf.berkeley.edu/~johnlab/pdfs/BFI-Chinese.pdf>.

openness and extraversion, because CEOs' extraversion was previously found to be related to strategic changes [56–57, 60–61] and therefore was included as a control variable in our analysis.

Raters were blind to the study hypotheses and performed their ratings independently. The average intraclass correlation coefficients (ICCs) for the Twitter sample are $ICC_{openness} = 0.69$ ($p < 0.001$) and $ICC_{extraversion} = 0.68$ ($p < 0.001$). The average ICCs for the Weibo sample are $ICC_{openness} = 0.87$ ($p < 0.001$) and $ICC_{extraversion} = 0.84$ ($p < 0.001$). Comparable to other studies on personality judgment from social media [e.g., 23, 62], the levels of ICCs suggest that our raters had agreement on both personality traits.

3.3 Diversifying M&A

We used the Securities Data Company's Mergers and Acquisitions database to obtain data on M&As for both the U.S. and Chinese firms³. We included both completed and uncompleted M&As because we were interested in the initiation of diversifying M&As, which we defined as the merging with or acquisition of firms from a different industry based on Fama and French's [51] industrial classification. Following Malhotra et al. [61], we coded the likelihood of initiating diversifying M&A as a binary variable that equals 1 if the firm conducted at least one diversifying M&A in a given year and 0 otherwise.

3.4 Control variables

The first set of control variables pertained to CEO characteristics. First, we controlled for extraversion, since extraversion was found to predict high levels of optimism and willingness to implement strategic changes [56–57, 60]. Second, we controlled for the CEO's age and tenure, as older and/or longer-tenured CEOs have been documented to be more resistant to uncertainty and change [56, 63]. Third, we controlled for whether the CEO is the founder of the company as founding CEOs have been noted to be more influential over the firm's strategies [56]. Following Herrmann and Nadkarni [56] and Malmendier and Tate [64], we further controlled for the CEO's gender and whether the CEO has an MBA degree.

The second set of control variables concerned firm characteristics⁴. As the costs and benefits of initiating and implementing mergers are different for manufacturing versus service industries [65], we first controlled for whether the firm is a manufacturing firm. Next, we controlled for firm size and firm age given that larger and older firms face greater inertia compared to younger and/or smaller firms when executing M&As [56]. Third, we controlled for a firm's past performance because higher past performance reinforces the incentive to maintain the status quo rather than initiating significant changes such as M&As [66]. Lastly, as prior studies have shown that

³ For details about the Securities Data Company's Mergers and Acquisitions database, see <https://www.refinitiv.com/en/products/sdc-platinum-financial-securities>.

⁴ Data obtained from the Wharton Research Data Services database; see <https://wrds-www.wharton.upenn.edu/>.

Tobin's Q and cash flow affect a firm's propensity to make acquisitions [64] we additionally controlled for both variables. For the Weibo sample, we also controlled for whether the firm is a state-owned enterprise because CEO influence may vary as a function of governance structures [67]. Finally, we controlled for linear time trends by including year as a control variable. All variables are defined in Table 1.

4 Results

A binary logistic regression was conducted to test our prediction. The model only contains the firm years when our sample of social media account holders held the CEO position. Whether an individual is a CEO or not is determined as of the fiscal year end. Following Malhotra et al. [61], regression models were run with robust standard errors clustered by CEO-firm observations. As shown in Table 2, openness was a significant predictor of initiating diversifying M&As. Controlling for all other variables, a one-unit increase in CEOs' openness ($SD=0.31$) increases the odds of initiating at least one diversifying M&A by 90% (odds ratio = 1.90, $p=0.004$). Based on statistical guidelines for collinearity diagnostics [68], the results show that there is no evidence of multicollinearity ($VIFs < 2.69$, tolerance > 0.37).

We replicated the same set of analyses for the Weibo sample. A binary logistic regression was conducted, and openness was a significant predictor of initiating diversifying M&As (see Table 3), replicating the results from the Twitter sample. Controlling for all other variables, a one-unit increase in CEOs' openness ($SD=0.40$) increases the odds of initiating at least one diversifying M&A by 52% (odds ratio = 1.52, $p=0.03$). There was no evidence of multicollinearity ($VIFs < 3.29$, tolerance > 0.30).

The consistent findings across both samples provide support for our hypothesis that openness perceived from social media is predicted with the initiation of diversifying M&As, even after controlling for predictors about CEOs' and their firm's characteristics.

5 Discussion

Openness to experience has been argued to play a central role in human inventiveness and exploration [1, 4, 7]. The present research demonstrates how openness manifests in business decision-making by revealing that the openness perceived from CEOs' social media predicted their firm's initiation of diversifying M&As, even after controlling for an extensive set of potential confounds. It highlights the role of personality psychology in corporate strategic decision-making, and attests to the usefulness of social media as a source of personality data, especially for those who are difficult to access.

Our results were notably consistent between the Twitter and Weibo CEO sample, despite differences between American and Chinese corporate executives and firms on many important dimensions (e.g., culture, ownership type and concentration, institutional environment). Successfully replicating our results across both samples sug-

Table 1 Variable definitions and descriptive statistics

Variable	Definition	U.S. sample Mean (SD)	China sample Mean (SD)
<i>Dependent variable</i>			
Diversifying M&A	An indicator variable that equals 1 if the firm has conducted at least one diversifying M&A in a given year and 0 otherwise. Diversifying M&As refer to firms' cross-industry M&As based on Fama and French's [51] industrial classification. They include both domestic and overseas M&As.	0.31 (0.46)	0.15 (0.36)
<i>Independent variable</i>			
Openness	Openness score of the CEO. If there are more than one manager in a given firm year, the score is averaged across the two managers.	3.57 (0.31)	3.28 (0.40)
<i>Control variables</i>			
Extraversion	Extraversion score of the CEO and/or chairman. If there are more than one manager in a given firm year, the score is averaged across the two managers.	4.01 (0.29)	3.71 (0.39)
Age	Age of the CEO. If there are more than one manager in a given firm year, then age is averaged across the two managers.	52.45 (11.54)	46.82 (6.33)
Tenure	The number of days between the fiscal year end date on which the CEO started his or her job and the fiscal year end date as of the year immediately before the merger.	2259 (1882)	1460 (1247)
Founder	An indicator variable that equals 1 if the CEO is also the founder of the firm and 0 otherwise.	0.47 (0.50)	0.37 (0.48)
Gender	An indicator variable that equals 1 if the CEO is female and 0 otherwise. If there are more than one manager in a given firm year, then the variable equals 1 as long as one of the managers is female.	0.03 (0.18)	0.06 (0.24)
MBA	An indicator variable that equals 1 if the CEO has an MBA degree and 0 otherwise; if there are more than one manager in a given firm year, then the variable equals 1 as long as one of the managers has an MBA degree.	0.13 (0.34)	0.24 (0.43)
Manufacturing	An indicator variable that equals 1 if the firm is a manufacturing firm and 0 otherwise.	0.21 (0.41)	0.32 (0.47)
Size	Log of total assets in the beginning of the year.	8.41 (2.30)	7.79 (1.15)

Table 1 (continued)

Variable	Definition	U.S. sample Mean (SD)	China sample Mean (SD)
Firm age	The number of years between the year in which the firm starts to have data in Compustat and the fiscal year immediately before the merger.	21.06 (16.22)	7.31 (5.14)
Prior returns	The market-adjusted buy-and-hold returns of the firm during the year before the merger.	0.13 (0.54)	0.16 (0.61)
Tobin's Q	Market value of assets (market equity plus total assets minus book equity) divided by book value of total assets.	2.91 (2.76)	2.53 (1.56)
Cashflow	Earnings before extraordinary items plus depreciation, normalized by net PPE.	1.05 (1.56)	1.93 (5.83)
SOE	An indicator variable that equals 1 if the firm is a state-owned enterprise (SOE) and 0 otherwise. This variable is only included for the Weibo sample.	-	0.37 (0.48)

Table 2 Effect of CEO openness on the likelihood of initiating diversifying M&As in the U.S. Sample

	OR (Robust SE)	Lower 95% CI	Upper 95% CI
Openness	1.90** (0.42)	1.23	2.94
Extraversion	1.24 (0.31)	0.77	2.01
Age	1.33 (0.26)	0.90	1.95
Tenure	0.48** (0.11)	0.31	0.74
Founder	1.36 (0.36)	0.81	2.30
Gender	1.19 (0.16)	0.92	1.54
MBA	0.67 (0.12)	0.47	0.94
Manufacturing	1.09 (0.16)	0.82	1.45
Size	4.87*** (1.88)	2.28	10.40
Firm age	1.06 (0.22)	0.71	1.58
Returns	0.84 (0.09)	0.67	1.03
Tobin's Q	0.83 (0.12)	0.63	1.11
Cashflow	0.80 (0.13)	0.59	1.09
Year	0.86 (0.20)	0.55	1.35
Constant	0.29*** (0.08)	0.17	0.49
Pseudo R ²	0.351		
CEO-firm-year observations	365		

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OR = odds ratio. Robust standard errors are clustered by CEO-firm observations. All variables have been z -standardized

gests the robustness of our findings. It is also important to note that the effect size of openness on diversifying M&As in the U.S. sample is much larger than the one in the Chinese sample. This could be due to cross-cultural differences between U.S. and China. Past research has shown that American culture is more individualistic while Chinese culture is more collectivistic [69]. This cross-cultural difference has also been found online, with platform culture being perceived as more individualistic on an American (i.e., Facebook) compared to Chinese (i.e., Renren) social networking site [70]. In collectivistic cultures, interdependence, cooperation, and in-group harmony are valued [71–74], whereas in individualistic cultures, self-expression [75], assertiveness [76], and competitiveness [74] are emphasised. Therefore, it is possible that U.S. executives are more likely to express their personal opinions and following their individual tendencies in decision-making than Chinese executives, and therefore have more influence on their corporate's strategic decision-making.

Meanwhile, research on cultural tightness-looseness [77] has shown that the U.S. has a generally looser culture with weaker norms and higher tolerance of deviant behavior compared to China. It is therefore possible that American CEOs' explorative and creative decisions, which could be considered deviant and violating the industry norm, are more likely to be accepted than those in China. Cultural tightness-looseness has also been found to influence online impression management [78]. Thus, American CEOs' openness on social media may play a stronger role in U.S. than in China. More future research is needed to further examine cross-cultural differences in how top executives' personality affects business decision-making.

The current study adds to a growing body of work that emphasizes the significant impact of personality factors that affect major business strategies [e.g., 46, 49]. Despite being highly relevant to the initiation of M&As, which carries a degree of

Table 3 Effect of CEO openness on the likelihood of initiating diversifying M&As in the China sample

	OR (Robust SE)	Lower 95% CI	Upper 95% CI
Openness	1.52* (0.28)	1.05	2.19
Extraversion	0.65 (0.18)	0.37	1.13
Age	0.68 (0.21)	0.37	1.23
Tenure	0.96 (0.33)	0.49	1.88
Founder	1.37 (0.24)	0.97	1.93
Gender	1.17 (0.20)	0.83	1.64
MBA	1.04 (0.17)	0.75	1.45
Manufacturing	1.41* (0.23)	1.02	1.93
Size	1.22 (0.23)	0.85	1.77
Firm age	0.86 (0.28)	0.45	1.64
Returns	1.31 (0.22)	0.95	1.81
Tobin's Q	1.04 (0.21)	0.70	1.54
Cashflow	0.76 (0.22)	0.43	1.35
SOE	1.13 (0.28)	0.69	1.84
Year	1.83** (0.43)	1.16	2.89
Constant	0.14*** (0.03)	0.10	0.20
Pseudo R ²	0.100		
CEO-firm-year observations	343		

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. OR = odds ratio. Robust standard errors are clustered by CEO-firm observations. All variables have been z -standardized

uncertainty as well as the potential for exploration and discovery, openness has yet to be examined in this context. Our finding supports prior research that leaders with high levels of openness are more willing to develop innovative strategies [79] and initiate strategic change [56]. Furthermore, our study may add a new perspective to the personality and business psychology literature by untangling the effect of extraversion and openness. Past research has shown that CEOs' extraversion was related to strategic changes [56–57, 60–61], possibly due to their high self-confidence or wide social network. In particular, Malhotra et al. [61] analysed CEOs' non-scripted conversations and showed that extraverted CEOs are more likely to engage in acquisitions, especially larger ones, and the effects are partially explained by their higher representation on boards of other firms. This suggests that extraversion is likely to be linked to business decisions that require boldness and social networking. In contrast, our study focused on diversifying M&A which serves as a measure of a company's explorative and creative behaviour, which is more likely to be related to CEOs' openness. Given the preliminary evidence from our study, more work is needed in this nascent direction to demonstrate the nuanced distinction between extraversion and openness in business decision-making.

Our study has important practical implications. Past research has relied on corporate executives' interviews or conversations to indirectly measure their personality [e.g., 61], since it is almost impossible to acquire in-depth self-report assessments of CEOs' personality. Our study extends this line work by showing the potential of using social media for CEOs' personality assessment, particularly those of publicly listed firms which are difficult to obtain. Even if the perceived personality from social media does not accurately reflect the true personality of CEOs, given the increasingly

widespread usage of social media among corporate executives, our study demonstrates new avenues for predicting business decision from social media, especially whether firms will engage in diversifying M&As, which are increasingly utilized by publicly listed firms to expand market share and improve their innovative capacities [14–15]. Harnessing the potential of social media and big data [80], future research may further expand the scale of our study by employing machine learning. For example, researchers may first train a prediction model based on a small sample of CEOs' social media and their human ratings of personality, and then apply the model to a large pool of CEOs' social media accounts.

The findings of this study also offer valuable insights for stakeholders such as boards of directors, investors, and corporate governance professionals. For example, boards of directors could benefit from considering personality traits such as openness when selecting or evaluating CEOs, as this trait may influence strategic decisions that carry significant implications for firm performance and growth. Firms aiming to expand into uncharted industries or markets may prioritize leaders with high openness, given their propensity for exploration and receptivity to novel ideas. Investors, on the other hand, could use these insights to better assess the potential strategic direction of firms based on the personality profiles of their top executives. Corporate governance professionals may also leverage these findings to design training programs that encourage open-mindedness and exploratory thinking among executives, thus fostering a culture of innovation at the leadership level. By integrating personality assessment into executive selection and development processes, stakeholders can enhance their ability to predict and influence firm-level outcomes, particularly in contexts involving high uncertainty.

There are a few limitations in our study. First, our study could not establish the causation between the CEOs' personality and M&A initiations. It is possible that the personality traits in our models are endogenous because firms with some unobservable characteristics may wish to undertake M&As and hence may have deliberately selected CEOs of a certain personality type to help with the execution of future M&As. However, while we acknowledge that this could be an issue for Twitter CEOs who are typically hired professional managers, this endogeneity concern is less likely to be applicable to Weibo CEOs. First, many of the Chinese firms in our sample are state-controlled. Existing research indicates that state-controlled Chinese firms' personnel decisions are typically determined by the Chinese government rather than by the board and are thus driven more by political rather than business considerations [cf. 81]. Hence, it would be less plausible that a state-controlled Chinese firm's CEO is selected mainly for the purposes of executing M&As. In addition, most non-state-controlled Chinese firms are managed by a controlling shareholder who also holds the position of either the board chairman, CEO, or both. Since the identity of the controlling shareholder in a non-state-controlled firm is predetermined, it is not a choice variable for the purposes of future M&As. As we found consistent results for both Twitter and Weibo CEOs, it is unlikely that our results are driven by this endogeneity problem.

Second, it is important to note that corporate executives' social media accounts contain more data than what had been used in this study. For example, we did not exploit CEOs' profile information, retweets, timestamps, or geo-locations. Hence,

researchers may consider including such data in future research. In addition, our study relied on data from Twitter and Weibo, two microblogging sites. This may limit the generalizability of our findings to microblogging users. Future research can analyze other social media platforms (e.g., Facebook, LinkedIn, Instagram) to cover different types of social media and a greater number of social media-savvy corporate executives.

Third, although the consistent results from the U.S. and Chinese sample imply the robustness of our finding, our sample size is relatively small. This is largely due to the difficulty of manually authenticating CEOs' social media accounts. Furthermore, our sample only covers two countries, which may limit the generalizability of our findings to other populations. Future research may employ approaches such as computer algorithms to automatically authenticate the social media accounts so that the sample size can be significantly increased.

Fourth, due to the difficulty of directly measuring CEOs' personality, our study could not empirically test how much CEOs' personality portrait on social media reflects their true personality. Although past studies have shown the validity of social media based personality assessment [e.g., 29], they are largely about the general population. Future study may use personality ratings from other sources (e.g., colleagues, employees) to cross-validate the ratings about CEOs from social media, and ensure the reliability of social media based personality assessment for this special population.

Finally, while human raters were effective in assessing CEOs' personality traits from social media in our study, this approach has inherent limitations. One major limitation is the subjectivity of human judgment, which may introduce biases or inconsistencies despite the relatively high inter-rater reliability observed in this study. Furthermore, the reliance on a relatively small group of raters with domain-specific backgrounds (e.g., business students) may limit the generalizability of the ratings to other populations. To address these limitations, future researchers could incorporate hybrid approaches that combine human judgments with automated techniques, such as machine learning algorithms, to enhance both accuracy and scalability. Researchers might also consider using larger and more diverse groups of raters, including professionals with expertise in personality psychology or executive behavior, to improve the robustness of the ratings. Additionally, future studies could explore the development of standardized rating protocols or guidelines to minimize variability and ensure consistency across different research contexts. These advancements would not only strengthen the reliability of social media-based personality assessments but also facilitate broader applications in organizational and business research.

6 Conclusion

Openness to experience is key to the human capacity for exploration and creativity, but research on the expression of openness in the business domain remains understudied. The present study explores the use of social media as a source of personality assessment for individuals who are difficult to access, and showed that openness judged from American and Chinese CEOs' social media predicted their company's

diversifying M&As. It provides a unique demonstration of how openness is reflected in strategic business decisions, and illustrates the potential of using social media to predict company strategy.

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Data availability Data and analysis code are available at <https://osf.io/jtcks/>.

Declarations

Conflict of interest The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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