Four Essays on the Effects of Displayed CEO Personality on Equity Funding Success in Young Firms

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List of Abbreviations

AI	Artificial Intelligence
CAT Scanner	Computer-aided text scanner
CEO	Chief Executive Officer
CF	C-filings under Regulation Crowdfunding (SEC)
DV	Dependent variable
EGC	Emerging Growth Company
ESG	Environmental, Social, and Governance
EU	European Union
F-stat.	F-statistic
GDPR	General Data Protection Regulation
H	Hypothesis
HEXACO	Honesty-humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness to experience.
HPT	Homepage text
I.Q.	Intelligence quotient
IBM	International Business Machines Corporation
ID	Identification
IPIP	International Personality Item Pool
IPO	Initial Public Offering
IV	Independent variable
JOBS Act	Jumpstart Our Business Startups Act
LIWC	Linguistic Inquiry and Word Count
Ln	Natural logarithm
Log	Logarithm
M	Mean
n	Sample size
OCEAN	Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism
OLCPT	Open Language Chief Executive Personality Tool

List of Abbreviations

OLS	Ordinary least squares
p	Significance level
p.	Page
Q&A	Questions and Answers
R&D	Research and Development
R^2	Coefficient of determination
RMSE	Root mean square error
RoA	Return on Assets
RQ	Research question
SD	Standard deviation
SEC	Securities and Exchange Commission
SIC	Standard Industrial Classification
TIPT-G	Ten Item Personality Inventory - German
U.S.	United States
USD	United States dollar
V.C.	Venture Capital
VHPT	Video and homepage text
VIF	Variance inflation factor
VT	Video text
z	Z-value
β	Regression coefficient
$\chi 2$	Chi-square

A. Introduction

1. Motivation and overview of the dissertation

One of the most decisive things an entrepreneur must face when starting a new company is to obtain capital to account for the needs and costs of the company's early development. At this time, investors are crucial and often the key prerequisite to build a successful business. Nowadays, there are several ways to obtain investor capital, from venture capital, IPOs, and angel investments to the newer alternative financing markets with, e.g., several forms of crowdfunding. One thing these forms of financing have in common is the need to persuade investors about the company, the business model, and the entrepreneurial team. While investors rely heavily on hard facts, like financial roadmaps, and risk factors (Ahlers, Cumming, Günther, & Schweizer, 2015), the entrepreneur herself also represents a crucial factor in investor assessments. Research has shown that investors consider many factors when assessing the entrepreneur as the face of a new company. They reach from the entrepreneur’s background in terms of education and prior experience to personal factors like age, gender, or ethnicity (Allison, Davis, Webb, & Short, 2017; Barbi & Mattioli, 2019; Courtney, Dutta, & Li, 2017; Moleskis, Alegre, & Canela, 2019; Younkin & Kuppuswamy, 2018). Further, appearance, self-presentation, and personality are taken into careful consideration (Moritz, Block, & Lutz, 2015b; Santos, Caetano, & Brochado, 2023; Thies, Wessel, Rudolph, & Benlian, 2016a)

When we watch TV shows like "Meet the Drapers", "Shark Tank", or "Höhle der Löwen" as German pendants, one can get a feeling of how much investors tend to value the character and story of the entrepreneurs while evaluating potential investments in their companies. Who can blame them? The person in front of a company dramatically impacts the business's success. The media is full of CEOs and entrepreneurs who are worshiped like pop stars not only because of their success but also because they have interesting

personalities. Take, for example, Steve Jobs, who was adored by the public for his charisma, attention to detail, and innovativeness. He also was a persuasive communicator which resonated with many people. Another example is Elon Musk, who is relentless in pursuing ambiguous goals that are often believed to be impossible. He inspires people with his fearlessness in pushing industry boundaries, risk-taking, and entrepreneurial mindset. Both people are (and were) visionary leaders who revolutionize industries with their products but also strike out with their unique personalities that are appealing, although sometimes controversial, in the public eye.

A third example is the entrepreneur Elizabeth Holmes and her company Theranos. As a young woman in the male-dominated Silicon Valley, she strived to persuade investors to invest in her young company. She had a complex personality that might have played a significant role in her ability to deceive numerous investors. Her compelling vision and confidence, combined with an aura of credibility and trust she projected to partners and the media, attracted millions of dollars in investments to her company, despite the fact that the developed products never worked. Even without any scientific evidence and several doubts about the company's ability to create a working product, Elizabeth Holmes gained supporters and raised millions in capital from investors. These investors with their limited knowledge are a good example for the information asymmetry that is ubiquitous within the investment context and can lead, like in the present case, to moral hazard (i.e., where one party exploits their superior knowledge). Elizabeth Holmes continued to deceive investors and supporters until *The Wall Street Journal*'s article uncovered the company's fraudulent practices in October 2015 (Carreyrou, 2015). Even though results were falsified, and business partners were deceived, it cannot be denied

that a significant element of her company's success can be attributed to her demeanor and her displayed personality.

This complex and context-dependent interaction between a founder's personality and the financing success of the respective venture is the topic I focus on within this dissertation. The relevance of the dissertation lies in its spotlight on the human element of financial success of young companies. The work sheds light on the underexplored aspect of the entrepreneur’s personality and its effects on their investment success.

The four essays this dissertation is based on revolve around the personality displayed by crowdfunding entrepreneurs and CEOs of (young) companies performing an IPO. Within the essays, we employed different methods, theories, and perspectives to illuminate the topic from various angles.

To explore the current body of literature in this field and narrow down the areas where further research is needed, the *first essay* (Chapter B) summarizes and reviews the literature regarding the effects of entrepreneurs' personality traits in crowdfunding. It makes clear statements regarding research gaps in the literature and the respective calls for further studies. Within the essay, we answer the research question:

> ***RQ 1****: What is the current body of knowledge regarding the relationship between personality factors and crowdfunding success, and where are knowledge gaps where the literature is silent?*

The *second essay* (Chapter C) addresses a research gap derived within the first essay, examining entrepreneurs displayed Big Five personality traits and their effects on financial success in equity crowdfunding campaigns, a research angle not investigated

before. The method used to determine the displayed personality traits relies on a narrative AI-based approach. The research question answered within the essay is:

> **RQ 2:** *Which perceived personality signals of entrepreneur's impact equity crowdfunding success?*

In the *third essay* (Chapter D), another technique for determining personality is applied within a similar context to essay one: naïve observer ratings. Within the study, observers rate videos of entrepreneurs employing personality questionnaires designed for that purpose. The aim is to investigate whether different methods of assessing personality led to similar research outcomes. Additionally, the investment intentions of the observers are also considered to examine whether their investment intentions outside the crowdfunding context predict the actual outcomes of the crowdfunding campaign. The research questions addressed in this essay is:

> ***RQ 3:*** *Which personality cues perceived by third-party raters, impact their investment intention (surveyed) and whether personality traits perceived by the third-party raters also correlate with crowdfunding success (realized capital on crowdfunding platforms)?*

While similar in its methodological approach to the second (text-based personality assessment), the *fourth essay* (Chapter E) shifts the context from crowdfunding to the more established investment arena of initial public offerings (IPOs). This study represents an attempt to generalize the findings to other investment domains, a call that was also derived from the first essay. Within the research we answer the question:

> ***RQ 4:*** *Does displayed CEO extraversion impact IPO success?*

The further introduction contains a summary of each included essay on the next pages, as well as an overview over the four essays containing the theoretical perspective, research objectives, results, contributions, methods, and employed sample of each research paper in table 1. The following full-length articles within the main body of this dissertation (Chapter B to E) are closed by an overarching conclusion (Chapter F) at the end.

1.1 Summary of Essay 1: Million Dollar Personality

The first paper of this dissertation is a systematic literature review that explores the current body of knowledge regarding the relationship between personality factors and crowdfunding success, as well as knowledge gaps where the literature is silent. It, therefore, sets the stage for all the following studies within this dissertation. The literature review was published in the *Management Review Quarterly* and was, by this time, to our knowledge, the first review of personality traits in crowdfunding[1].

For the literature review, we conducted a comprehensive search of scientific databases combining the keywords "personality", "big five" (McCrae & Costa, 1987), all individual big five traits, the "dark triad" (Paulhus & Williams, 2002), "narcissism", and basic personality traits ("self-efficacy," "innovativeness," "locus of control" and "need for achievement") with the terms "crowdfunding". We then screened the retrieved articles based on their relevance to personality in crowdfunding and employed specific criteria to assess each article's fit, leading to a total of 28 articles within the review. Forward and backward searches ensured the comprehensiveness of our findings. We decided on a topic-centered and content analysis (e.g., Colombo, 2021). Therefore, we first collected classical descriptive data for each paper and identified and recorded topic-specific data

[1] The study predates the widespread introduction of AI-based tools for literature reviews.

(e.g., crowdfunding type, theoretical approach, methodology, variables, perspectives). Second, we analyzed (1) the results of the quantitative papers focusing on crowdfunding outcomes and (2) the limitations and future research opportunities suggested by the authors of the reviewed papers.

Our findings on the quantitative studies suggest a positive relationship between openness and crowdfunding success, while narcissism shows an inverted U-shaped relationship with crowdfunding success. However, the effects of other personality traits on crowdfunding success are inconclusive. Beyond this, our literature review shows a very young and budding research field that offers considerable room for further research. First, studies should examine nonlinear relationships between personality traits and crowdfunding success. Second, there is a need for more studies using quantitative or mixed-method approaches. Third, replication studies in similar and different contexts are needed. Fourth, a plurality of personality perspectives (e.g., investor perspective, third parties) should be considered in future research.

In addition to our findings and implications, the literature review provides a conceptual foundation on personality in the entrepreneurial context. We discuss the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism) (McCrae & Costa, 1987) and other baseline personality traits (self-efficacy, innovativeness, locus of control, and need for achievement) that are frequently studied in entrepreneurship research. We also explore the Dark Triad (narcissism, Machiavellianism, and psychopathy) (Paulhus & Williams, 2002) and their relevance in the entrepreneurial context.

Overall, our paper contributes to our understanding of the role of personality traits as a crowdfunding success factor and provides not only an overview of the state of

knowledge, but valuable insights for researchers in the field. Further, a valuable contribution for practitioners in the investment context is that for entrepreneurs seeking capital from the crowd, our combined results from the studies reviewed suggest that displaying certain personality traits (e.g., openness) when crafting campaign narratives in certain types of crowdfunding (e.g., reward-based) can indeed impact the success of entrepreneurs' crowdfunding campaigns.

1.2 Summary of Essay 2: In the Eye of the Beholder

The second study included in this dissertation was selected as one of the Best Papers of the *2021 Academy of Management Conference* for the entrepreneurship track and nominated for the Most Insightful Paper Award at the entrepreneurship track of the *2021 European Academy of Management Conference*. It was also published within the 2021 Academy of Management Conference Proceedings. Further, a short version of the paper was presented at the *2021 International Conference on Information Systems (ICIS)* and is also included in the respective proceedings. Within the study, we utilized a comprehensive dataset of U.S.-based equity crowdfunding projects and supplementary secondary data to investigate the context-dependence of personality traits in equity crowdfunding.

In equity-based crowdfunding, entrepreneurs must persuade investors to finance their venture in exchange for shares in the firm. Hereby, expressed personality traits can play pivotal roles in shaping how the entrepreneurs' narratives are communicated to and perceived by investors (Thies et al., 2016a). A meta-analysis demonstrated that personality traits relate to entrepreneurial intentions and performance (Zhao, Seibert, & Lumpkin, 2010). Research on the influence of the Big Five personality traits on campaign success in rewards-based crowdfunding finds evidence for the positive impact of

openness, agreeableness, and extraversion (Gera & Kaur, 2018; Thies et al., 2016a). Nevertheless, the role of personality signals in equity crowdfunding and the corresponding financing success still needs to be clarified.

We seek to fill this gap by answering the research question of how perceived personality signals impact equity crowdfunding. Further, we investigate and exploit the theoretical construct of negativity bias in this setting.

Based on both signaling (Spence, 1978) and the Five-Factor personality theory (McCrae & Costa, 1987) and grounded in previous empirical findings, we hypothesize that on a basic level, agreeableness, openness, and conscientiousness positively influence equity crowdfunding success. In contrast, extraversion and neuroticism have a negative impact. Further, we argue that the negative effect of perceived neuroticism (the only "negative" trait of the Big Five) is amplified by increasing information volume (text/video content) following the construct of the negativity bias (Rozin & Royzman, 2001).

We tested our hypotheses on personality signals and equity crowdfunding success using 709 equity crowdfunding campaigns collected from four leading U.S.-based equity crowdfunding websites enriched with corresponding investor pitch videos and supplementary SEC data. We extracted scores for the Big Five personality traits via IBM Personality Insights[2] for the campaign descriptions and corresponding video subtitles. To test our hypotheses, we ran linear regression models with robust standard errors, utilizing log transformation for those variables that were not normally distributed. Our dependent variable is the natural logarithm of the final funding amount for each campaign. Based on previous literature (e.g., Barasinska & Schafer, 2014; Barbi & Mattioli, 2019; Mollick, 2014), we also control for the funding platform, project size, category, location, number

[2] IBM Personality Insights is unfortunately no longer accessible. Documentation links can still be found via web archives.

of speakers in the video, the duration of the campaign, the maturity of the company, text quantity, video length, as well as the number of updates and comments. Finally, we ran several robustness tests with similar results.

We find that the Big Five Personality traits serve as signals of equity crowdfunding success, significantly affecting both the funding amount received and the number of investors attracted by campaigns. Specifically, work shows that not only do the Big Five personality traits seem to play a role in funding decisions by equity investors in the crowd, but that among these, the negative signal of perceived neuroticism seems to dominate the positively connotated Big Five traits. Moreover, we find that the information volume of a given campaign amplifies the negative effect of perceived neuroticism on funding success, suggesting a role for negativity bias.

This study extends the literature on the relationship between personality and entrepreneurial finance by providing new input to a debate on the impact of individual-level components on entrepreneurial outcomes. We contribute to theory and practice by demonstrating the context-dependent nature of personality signals in online venture financing and thereby help entrepreneurs understand the crowds' need for specific signals. Our study also contributes by empirically demonstrating the theorized role of negativity bias in human investment decisions.

The study, in the context of this dissertation, sets the ground for further exploring the role of personality in equity-based crowdfunding. It helps to position this crowdfunding type within the context of alternative financing models. Specifically, the study gives equity-based crowdfunding its own space as the generated results lean more towards those uncovered in related literature on business angel financing and deviate from other forms of crowdfunding.

1.3 Summary of Essay 3: When Personality Pays

The third paper included in the dissertation examines the relationship between third-person ratings of entrepreneur's personality traits and investment intention and the success of equity crowdfunding campaigns. It thereby expands the previous paper in two distinct ways. First, it includes not only the actual success of the crowdfunding campaign but also the investment intention indicated by third persons. Second, personality is not assessed by a narrative approach but by naïve observers rating the actual campaign pitch video. The paper was recently published in Venture Capital and joins a growing debate in this journal on the role of 'soft' factors such as pitch videos and narratives in driving investor decisions to finance new ventures (e.g., Perry, Chand, & Ring, 2015; Tata & Niedworok, 2020) and particularly the substream that investigates the role of entrepreneurs' personality in successfully financing the venture (e.g., Anglin et al., 2018a; Block, Fisch, Obschonka, & Sandner, 2019).

For the study, we collected data from two leading crowdfunding platforms in the U.S. (StartEngine and Wefunders) and randomly selected 100 crowdfunding campaigns where the entrepreneur was visible in the pitch video included in the campaign. We then used a videometric approach, which involved integrating the campaign pitch videos into an online questionnaire and led to 1,175 unique ratings of the personality of the entrepreneurs displayed in the videos. The ratings were conducted by naïve observers employing the Ten-Item Personality Inventory (TIPI-G) (Gosling, Rentfrow, & Swann, 2003).

Our results indicate that the observer’s impression of the entrepreneur's Big Five personality traits (openness, conscientiousness, and extraversion) (McCrae & Costa, 1987) were predictive of both the observers' investment intention and the campaign's

actual crowdfunding success. Our study thereby provides evidence that personality cues based on pitch narratives can be valuable signals for equity crowdfunding success. The findings also highlight the importance of personality signals for both experienced and inexperienced investors.

Our study makes two main contributions to the literature. First, it contributes to our knowledge of how investor decisions in equity crowdfunding (e.g., Wallmeroth, 2019) and, in particular, regarding the conditions under which personality cues based on pitch narratives are predictive of equity crowdfunding campaign outcomes by shaping both investing intentions and the degree of funding success. Second, by showing that the direction of these effects remains for both dependent variables (investment intention and funding success), we make a methodological contribution in this stream by showing that perceived personality cues based on survey-based investment intentions are a valuable proxy for actual investment volume (i.e., funding success). A secondary contribution of the study is that we demonstrate the effectiveness of the TIPI-G personality inventory in a new context (equity crowdfunding).

Our study can inform entrepreneurs who plan to pursue equity crowdfunding. Based on our results, it is valuable to increase one's self-awareness regarding the personality signals communicated in the campaign and thereby optimize the message to the crowd.

1.4 Summary of Essay 4: Show of Strength

The last paper included in this dissertation transfers the context of alternative finance from the before-investigated to a more established one. The study investigates the impact of CEO extraversion (a Big Five trait) (McCrae & Costa, 1987) on the success of initial public offerings (IPOs) in both established and young companies. We thereby

analyze if the results and trends we see in the context of equity crowdfunding can also be found in the context of public offerings, where the disclosing standards and the money involved increase dramatically. The aim of investigating the role of perceived personality in the more traditional context of IPOs was to strengthen the thesis's generalizability and explore the extent of context dependencies uncovered in the literature review (essay one). The paper was presented at several conferences and benefitted from the double-blind peer review process of *Venture Capital*'s special issue on "The Role of Personality Traits in Entrepreneurial Finance".

Within the paper, we investigate the influence of the company's CEO's extraversion on the company's market value and the underpricing of the initial public offering. We further include the age of a company to differentiate between established and young companies. Drawing on signaling and on Upper Echelon Theory (Hambrick & Mason, 1984; Spence, 1978), we argue that a show of strength (high signs of extraversion) of the CEO positively impacts market value and reduces underpricing. We further suggest that the effects are even more substantial for young companies, as they disclose less information (no historical data, less disclosing standards for emerging growth companies), thereby increasing the information asymmetry in the IPO.

Our research utilized CEO earning calls and the Open Language Chief Executive Personality Tool (OLCPT) to measure the extraversion displayed by CEOs of companies (Harrison, Thurgood, Boivie, & Pfarrer, 2019). We include SEC information on the IPO process and additional variables from the IPO prospectus, the Ritter database, and Thomson Reuters Eikon.

The results reveal that CEO extraversion displays are positively associated with the market value of a company during and after the IPO. It further seems to positively

influence underpricing, leading to more "money left on the table" for companies with CEOs who display more extraversion. Additionally, the interaction between CEO extraversion and company age significantly affects underpricing.

These results trigger an exciting line of thought: On the one hand, displayed CEO extraversion is positively correlated with the firms' market value. On the other hand, in terms of IPO performance, the display of extraversion seems to lead to increased underpricing, a sign of higher information asymmetries. This effect is even more substantial for young firms. Focusing on the underpricing, the extraversion displays on behalf of CEOs seem to lead to fewer investments in the respective company, an effect we also observe in our previous studies on displayed extraversion in the equity crowdfunding context. Therefore, in both contexts, displayed extraversion leads to higher information asymmetry perceived by the investors and, thereby, to a smaller investment in the company. Investors might perceive extraversion negatively because it is linked to traits like narcissism, overconfidence, and impulsivity, which can increase a firm's stock risk and expected capital costs (Creek, Allison, Sahaym, Hmieleski, & Maurer, 2019; Harrison, Thurgood, Boivie, & Pfarrer, 2020; Kristof-Brown, Barrick, & Franke, 2002; Miller, 2015; Revelle, 1997; Schaefer, Williams, Goodie, & Campbell, 2004).

Our study has several implications. First, it contributes to the literature by shedding light on the role of personality in the IPO process. Second, combined with previous studies, it builds a bridge between equity crowdfunding and IPOs, suggesting similar effects of CEO extraversion in both fields. Third, it provides insights for practitioners, as the results can help companies that plan to go public in their strategy regarding how to present their leading personnel to not further increase asymmetries, especially in the case and high-risk context of young firms.

Table 1: Characteristics of the four essays included in this dissertation

	Title	Theoretical Perspective	Research Objectives	Results	Contributions	Method	Sample
Essay 1	Million Dollar Personality: A Systematic Literature Review of Personality in Crowdfunding	Topic-centered content analysis	Analyzing the current body of research regarding the relationship between entrepreneurs' personality factors and crowdfunding success.	The body of literature indicates a significant relationship between an entrepreneur's openness and narcissism and crowdfunding success. Effects of other personality traits are inconclusive which calls for more research on the topic.	The article provides researchers with a comprehensive overview of the current body of research highlighting consistent as well as inconclusive findings in the literature. Further, four main gaps in the literature are identified	Topic centered analysis based on the results of a keyword search within the leading literature databases (EBSCO Host, Web of Science, and Scopus) and additional forward and backward search.	The analysis includes 28 articles published between January 2015 and March 2021.
Essay 2	Success Lies in the Eye of the Beholder: Implicit Personality and	Signaling Theory; Negativity Bias	Examine the impact of perceived personality traits of entrepreneurs on the success of their	The results show that openness and conscientiousness of entrepreneurs positively predict	The study contributes to research on signaling and entrepreneurship in	The study is based on a narrative approach utilizing the IBM Personality	The study is based on a sample of 709 campaigns collected from the four leading equity

	Negativity Bias in Equity Crowdfunding		equity crowdfunding campaign	observers' investment intention and actual funding success in equity crowdfunding campaigns.	the alternative finance market. It shows that personality signals favored in equity crowdfunding show fewer similarities to reward based crowdfunding than to angel investments.	Inventory to assess the Big Five Personality traits from written campaign text. The results are derived via OLS regression with fixed effects for the crowdfunding platform.	crowdfunding platforms in the U.S.
Essay 3	When Personality Pays: Observer Rating of Personality and Financial Success of Equity Crowdfunded Startups	Signaling Theory; Information Asymmetry	Investigate how entrepreneurs' personality traits, as signaled in their campaign pitch videos influence observers' investment intention and actual crowdfunding success.	The personality traits of openness, conscientiousness, and extraversion predict observers' investment intention and actual equity crowdfunding success.	An empirical contribution is made by the design of the study as it bridges information on investment intention and actual investor contribution, thereby validating the investment intention as proxy for real life investment decisions.	The study is based on a video-metric approach utilizing naïve observer ratings of the Ten Item Personality Inventory (TIPI-G). The results are derived via OLS regression with fixed effects for the crowdfunding platform.	The study is based on 1175 ratings of 100 randomly selected investor pitch videos of equity crowdfunding campaigns.

Essay 4	Show of Strength: Extraverted CEOs and IPO Success in Established and Young Companies	Signaling Theory Upper; Echelon Theory	Investigating the CEOs Big Five personality trait extraversions influence of the IPO success (market value and underpricing) of young and established firms	The extraversion of CEO's positively affects market value of a company and increases IPO underpricing. The association between high underpricing and high extraversion becomes stronger for young companies compared to established.	The study makes a methodological contribution, as it utilizes a novel approach to assess COE Personality. It further contributes to the praxis by providing information about displayed personality traits that positively affect IPO success.	The study is based on a narrative approach utilizing the Open Language Chief Executive Personality Tool (OLCPT) to assess the Big Five Personality traits from Q&A sessions of earning calls. The results are derived via OLS regression with fixed effects for the industry of the company.	The study is based on over 800 IPOs and respective company earing calls.

2. Additional Remarks

The four essays were composed for submission to peer-reviewed international academic journals. They form the dissertation's body and were each developed as standalone publication projects, resulting in variations in their publication stages and co-authorship. Table 2 contains an overview of the status of each of the four essays.

Essay 1: Neuhaus, J., Isaak, A., & Bostandzic, D. (2022). Million dollar personality: A systematic literature review on personality in crowdfunding. *Management Review Quarterly*, *72*(2), 309-345. https://doi.org/10.1007/s11301-021-00242-9

Essay 2: Neuhaus, J., Isaak, A. J & Bostandzic, D. Success Lies in the Eye of the Beholder: Personality Traits, Negativity Bias and Equity Crowdfunding. *Working Paper*

Essay 3: Isaak, A., Neuhaus, J., & Bostandzic, D. (2024). When personality pays: observer rating of personality and financial success of equity crowdfunded startups. *Venture Capital*, 1-31. https://doi.org/10.1080/13691066.2024.2303663

Essay 4: Neuhaus, J. & Bostandzic, D. Show of Strength: Extraverted CEOs and IPO Success in Established and Young Companies. *Working Paper*

Table 2: Current status of the four essays

	Current State	Conferences /Awards
Essay 1	Published in Management Review Quarterly (Springer)	• none
Essay 2	Short paper published in Proceedings of the International Conference on Information Systems (ICIS) and 2021 Academy of Management Conference Proceedings	Conferences: • Academy of Management Specialized Conference: Advancing Management Research in Latin America (AOM LA), Mexico City, Mexico, April 15-17, 2020 (accepted for presentation, conference was cancelled due to COVID-19). • 24. Interdisziplinäre Jahreskonferenz zu Entrepreneurship, Innovation und Mittelstand (G-Forum), (virtual), September 28- October 2, 2020; • 34th Research in Entrepreneurship and Small Business Conference (RENT), (virtual), November 19-20, 2020. • 21st European Academy of Management Conference (EURAM), Montreal, Canada (virtual), June 16-18, 2021. • 81st Annual Meeting of the Academy of Management (AOM), (virtual), July 29- August 4, 2021. • 42nd International Conference on Information Systems (ICIS), Austin, USA (virtual), December 12-15, 2021. Awards: • Judged as best paper at the 81st Annual Meeting of the Academy of Management (AOM), (virtual), July 29- August 4, 2021. • Nominated for the Most Insightful Paper Award at the entrepreneurship track of the 2021 European Academy of Management Conference.

Essay 3	Published in Venture Capital (Taylor & Francis)	• None
Essay 4	Reviewed for Venture Capital (Taylor & Francis)	Conferences: • 82nd Annual Business Researcher Conference (VHB), Frankfurt, Germany (virtual), March 17-20, 2020. • 35th Research in Entrepreneurship and Small Business Conference (RENT), Turku, Finland, November 18-19, 2021. • 21st Nordic Conference on Small Business Research (NCSB), Kolding, Denmark, May 18-20,2022.

B. Essay 1: Million Dollar Personality: A Systematic Literature Review of Personality in Crowdfunding[3]

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[3] Published (double-blind, peer-reviewed) in Management Review Quarterly (2022), 72(2), 309-345; Share of relative contribution to this paper: Julia Neuhaus (65%), Andrew Isaak (25%), and Denefa Bostandzic (10%).

1. Abstract

Expressed personality traits can play a pivotal role in convincing investors in crowdfunding. Our study answers the research question: What is the current body of knowledge regarding the relationship between personality factors and crowdfunding success and where are knowledge gaps where the literature is silent? In our literature review, we therefore analyze and categorize (1) the results provided by quantitative studies on the relationship between the personality of entrepreneurs and crowdfunding success and (2) the research gaps identified by the authors investigating personality in crowdfunding. We find that studies investigating the entrepreneur's personality, i.e., the Big Five, other baseline personality traits (self-efficacy, innovativeness, locus of control, and need for achievement) and the Dark Triad, find positive relationships between openness and crowdfunding success, while narcissism shows an inverted u-shaped relationship with crowdfunding success across articles. However, the effects of other personality traits on crowdfunding success are largely inconclusive. Further, we identify four main gaps in the literature. First, future studies should examine non-linear relationships between expressed personality traits and crowdfunding success. Second, there is a need for more studies that employ different methods like qualitative or mixed-method approaches. Third, replication studies in similar and different contexts are urgently needed. Fourth, a plurality of personality perspectives would strengthen future research (e.g., investor perspective, third party perspective). To our knowledge this is the first literature review of personality traits in crowdfunding. Our work aims to enrich our understanding of individual-level components in the underexplored alternative finance market.

2. Introduction

Young firms face the challenge of acquiring early stage venture capital (Drover, Wood, & Zacharakis, 2017) which more than doubles their chances of survival (Puri & Zarutskie, 2012). To finance their venture, entrepreneurs increasingly face a number of options outside of traditional venture capital funding or business angel investments. One example of such alternative financing methods is crowdfunding, which opens new pathways for young firms to raise capital in a less regulated way than via classical funding instruments (Cumming, Meoli, & Vismara, 2019b). Crowdfunding presents a financing method in which firms acquire capital from a crowd of individuals via an open call (Belleflamme, Lambert, & Schwienbacher, 2010). Entrepreneurs turn to crowdfunding when they need financial assistance to realize a project. Via crowdfunding, entrepreneurs can also acquire customers and validate their business models or ideas at an early stage while simultaneously retaining a high degree of independence from individual investors. Types of crowdfunding include borrowing money online for investments (lending-based), offering products or rewards for pre-sale (reward-based), collecting donations to realize charitable projects (donation-based), or selling equity shares of a company to a crowd of investors (equity-based). The types of crowdfunding significantly differ from each other. For example, equity crowdfunding gears toward long-term investments, whereas other types of crowdfunding typically involve pre-selling, short-term loans, or donations regarding future projects. Similarly, entrepreneurs seeking equity crowdfunding are in a somewhat similar stage to those that receive classical venture capital or angel financing, as these settings both involve a (long-term) stake in the venture. This similarity does not hold for most other crowdfunding forms.

B. Essay 1: Million Dollar Personality: A Systematic Literature Review of Personality in Crowdfunding

A growing stream of literature investigates factors that lead to successful crowdfunding (Wiklund, Davidsson, Audretsch, & Karlsson, 2011). Authors find that several "hard facts" such as the target investment amount, the number of investors/backers to date, provided roadmaps, Facebook shares, or the location of a company impact the outcome of a crowdfunding campaign (Ahlers et al., 2015; Bertrand & Schoar, 2003; Bi, Liu, & Usman, 2017; Block, Hornuf, & Moritz, 2018; Chan & Parhankangas, 2017; Courtney et al., 2017; Davis, Hmieleski, Webb, & Coombs, 2017; Janku & Kucerova, 2018; Prodromos, Theriou, & Sarigiannidis, 2014). “Softer factors” that include media richness (e.g., use of photos and videos), third-party endorsement, and campaign updates can also drive the funding process (Courtney et al., 2017; Wang, Chen, Zhu, & Wang, 2020). In addition, individual-level factors are critical for crowdfunding success. For example, entrepreneurs’ education and professional background, previous funding experience, and gender or ethnic background can influence the crowd’s contributions to a given campaign (Allison, Davis, Short, & Webb, 2015; Barbi & Mattioli, 2019; Courtney et al., 2017; Moleskis et al., 2019; Younkin & Kuppuswamy, 2018).

Within this stream, a unique discourse relates to the entrepreneur's personality. Personalities describe the unique combinations of traits that form people's individual character. In line with the entrepreneurship field in general, research in crowdfunding has also begun to study the impact of personality on funding success. Two studies examine the influence of the Big Five personality traits on reward-based crowdfunding success on the website Kickstarter (Gera & Kaur, 2018; Thies et al., 2016a). Further, Bollaert et al.'s (2019) research indicates a negative impact of narcissistic personality traits on funding success, while other authors find inconclusive relations of narcissistic rhetoric to crowdfunding success depending on the compliance with other characteristics of the

entrepreneur (Anglin, Wolfe, Short, McKenny, & Pidduck, 2018b). Regarding hubris and charisma, researchers have found that entrepreneurs perceived as scoring high on these traits are more successful in raising funds (Sundermeier & Kummer, 2019). Moritz et al. (2015) argue that perceived sympathy, openness, and trustworthiness are essential in reducing information asymmetries (e.g., where one party knows more than the other and could exploit this information supremacy) between entrepreneurs and investors in the crowdfunding context.

As an alternative method of financial resource acquisition, crowdfunding is of special interest for entrepreneurship research (Landström & Harirchi, 2019), especially when combined with the "most promising topical areas in entrepreneurship research" (Kuckertz & Prochotta, 2018, p. 3), e.g., entrepreneurial behavior and psychology. Although promising, crowdfunding does not come without challenges for entrepreneurs seeking capital and particularly for investors when trying to discern entrepreneurs' chances of success. On the one hand, investors face increased information asymmetries than they would in other funding types (Cumming, Deloof, Manigart, & Wright, 2019a). These arise from reduced disclosure requirements for fund-seeking entrepreneurs (Cumming et al., 2019a), the use of new media tools, and the lack of opportunity to directly question campaign initiators. Such circumstances increase the need for cognitive shortcuts to make investment decisions. These are based (among others) on impressions of entrepreneurs' personality and used, for example, to access the entrepreneur's capability to lead a successful venture. For entrepreneurs, on the other hand, funds are not acquired via direct interaction but through means of computer-mediated communication (Pollack, Maula, Allison, Renko, & Günther, 2021). Investments are mediated by online fundraising platforms where personality is displayed and perceived in a very different

way than in traditional and interpersonal settings (e.g., with an angel investor or loan agent). For entrepreneurs in the context of crowdfunding, knowing which personality displays convince the crowd to invest in their campaigns is of particular practical relevance, as it can shape investor perception and therefore campaign success. In crowdfunding, the personality impression perceived by investors is literally worth up to a million dollars (JOBS Act; (Ahlers et al., 2015)), inspiring the title of this paper.

Although a growing body of literature summarizes and evaluates crowdfunding success factors, personality plays no role in these reviews. To our knowledge, no previously published literature review focuses on personality factors in crowdfunding, although the implications both for practice (as explained above) and for the scientific community are essential. Combining the representative findings on crowdfunding and personality from disparate studies into one literature review would focus future research on relevant gaps and broaden the impact of this field. Additionally, identifying areas where the results from crowdfunding are generalizable to other forms of entrepreneurial financing would create the opportunity to transfer implications from crowdfunding, with its easy accessibility and high sample sizes, to other areas where research is scarce due to difficulties to access data (e.g., business angel financing) (Cumming et al., 2019b). We address this gap by examining the following research question: What is the current body of knowledge regarding the relationship between personality factors and crowdfunding success, and where are knowledge gaps where the literature is silent?

Our study finds a trend towards more research on entrepreneurial personality in crowdfunding and a tendency to employ software-based narrative methods and questionnaires. We identified four main gaps that should be addressed by future research studies. First, future quantitative studies should examine nonlinear (e.g., quadratic)

relations between expressed personality traits and crowdfunding outcomes. Second, future studies should employ different methods e.g., mixed methods approach in order to validate existing narrative methods, such as by combining them with questionnaires. Third, authors should conduct replications in highly similar settings to strengthen results as well as in different contexts, e.g., crowdfunding types, to explore different effects of personality. Fourth, studies are required that investigate not only the personality of entrepreneurs but change/flip the perspective and also investigate the personality of investors and how they interact during the crowdfunding process.

In the following, we first describe the conceptual background of personality constructs and the chosen methodology, as well as our analysis of the selected literature. Finally, we highlight commonalities, differences, and gaps, in addition to implications and suggestions for future research.

3. Conceptual Background on Personality in the Entrepreneurial Context

The personality of an individual is the basis that effects a person's decisions and behavior in everyday life situations as well as in the economic aspects of life (McAdams & Pals, 2006). The broad concept of personality includes a range of aspects from abilities such as different forms of intelligence, motives, attitudes up to a person's characteristics and temper (Brandstätter, 2011). Taken together, personality can be seen as the foundation for individual differences between humans (Mairnesse, Walker, Mehl, & Moore, 2007). Studies suggest that personality is an underlying system that develops until the age of 30 and then stays stable over adolescent life (Costa & McCrae, 1988). In the entrepreneurship literature, authors investigate a wide variety of personality aspects.

The personality theory most frequently investigated in entrepreneurship is the Big Five personality theory from psychology (e.g., Brandstätter, 2011; Kerr, Kerr, & Xu,

2017; Mueller & Thomas, 2001; Rauch & Frese, 2014). Research in entrepreneurial finance finds effects of the Big Five on business angel syndication, investment management, and loss aversion in the financial domain (Block et al., 2019; Boyce, Wood, & Ferguson, 2016; Mayfield, Perdue, & Wooten, 2008). The concept focuses on five key traits: First, openness, when strongly expressed, is a driver for the need for variety and intellectual curiosity (Costa Jr & McCrae, 1995). People that rate high on openness seek new experiences. In a business-related context, people with high openness ratings are socially skilled. Scientists suggest that they are good salespeople and have managerial skills (Almlund, Duckworth, Heckman, & Kautz, 2011). People who rate low on openness are risk averse (Almlund et al., 2011). Researchers associate openness with intelligence and creativity, but also with negative aspects such as sensation-seeking and a tendency to question authority (Costa Jr & McCrae, 1995). Second, conscientiousness relates to striving for achievement, hard work, dutifulness, and self-discipline (Almlund et al., 2011; Bozionelos, 2004). In the business context, conscientiousness is a predictor for career success, job performance, and wages (Almlund et al., 2011; Hogan & Ones, 1997; Judge, Higgins, Thoresen, & Barrick, 1999). Third, extraversion is associated with sociability, optimism, ambition, positive emotionality, cheerfulness, dominance, and excitement seeking (Barrick, Mount, & Judge, 2001; Bozionelos, 2004; Watson & Clark, 1997). High scores in extraversion predict effective job performance, the likelihood to reach a leadership role, and wages (Almlund et al., 2011; Barrick & Mount, 1991; Bozionelos, 2004; Ciavarella, Buchholtz, Riordan, Gatewood, & Stokes, 2004; Judge et al., 1999). Fourth, agreeableness is a trait often summarized as warmness. People with high scores on agreeableness tend to be altruistic, friendly, flexible, courteous, forgiving, modest, and trustworthy (Almlund et al., 2011; Barrick et al., 2001; Bozionelos, 2004).

Studies demonstrate a negative relationship between agreeableness and career success or work involvement (Bozionelos, 2004). Fifth, neuroticism (also referred to as emotional instability) is related to the experience of negative emotions, insecurity, low goal-orientation, and low self-esteem (Almlund et al., 2011; Bozionelos, 2004). Research also finds negative associations between neuroticism and job search efforts, work performance, performance motivation, and extrinsic success (Almlund et al., 2011; Judge & Ilies, 2002).

Other baseline key personality traits frequently studied in entrepreneurship (aside from the Big Five) are self-efficacy, innovativeness, locus of control, and need for achievement (Kerr et al., 2017; Rauch & Frese, 2014), explained hereafter. First, self-efficacy as part of the personality is of particular interest regarding entrepreneurs as it describes a person's inclination to see themselves as capable of performing actions and aligning themselves with self-set goals (Chen, Greene, & Crick, 1998; Rauch & Frese, 2014). Overcoming failure can also be counted as self-efficacy (Harburg, Hui, Greenberg, & Gerber, 2015). Second, innovativeness is strongly linked to a person's ability to engage in new things. Innovative people are those in a society who adapt to change faster than the average (Manning, Bearden, & Madden, 1995). Since innovativeness is a prerequisite for innovation, it is a crucial personality component in entrepreneurship. Third, locus of control is closely linked to a person's belief in their ability to determine their destiny (Hoffman, Novak, & Schlosser, 2003). Researchers differentiate between external and internal locus of control. An external locus of control refers to when people perceive their future to be shaped by their environment and not by their own actions. In general, founders tend to have an internal locus of control, which refers to situations where people are convinced that they can shape their future by their actions and decisions (Rotter,

1966). Fourth, the need for achievement is a personality factor that goes back to David McClelland's Motivation Theory (Johnson & McClelland, 1984). A high need for achievement describes people who are not satisfied with routine tasks but strive for challenges and continuous improvement (Rauch & Frese, 2014). They take responsibility for the results they achieve and demand feedback for their actions. Many studies highlight the relevance of this trait for founders (Rauch & Frese, 2007), as it can influence venture size and growth (Lee & Tsang, 2001).

A personality aspect of increasing interest to researchers is narcissism (Bollaert et al., 2019; Butticé & Rovelli, 2020). Narcissistic individuals are generally perceived as arrogant and self-centered. They usually have an elevated image of their achievements and react with offense or even aggression when questioned (Miller, Widiger, & Campbell, 2010). On the other hand, narcissism can also have positive effects, e.g., on self-confidence and self-respect, if not overly expressed (Paulhus & Williams, 2002). Therefore, these characteristics are clearly relevant for entrepreneurs. Narcissism is one of three characteristics summarized as the "Dark Triad" (Paulhus & Williams, 2002) which refers to the three socially aversive traits narcissism, Machiavellianism, and psychopathy. These traits reflect self-promotion, emotional coldness, and aggressive behavior in a person's character (Paulhus & Williams, 2002). Focusing on manager characteristics, the dark triad and, in particular, narcissism diminish the positive effect of entrepreneurial orientation and thereby negatively influence firm performance (Bouncken, Cesinger, & Tiberius, 2020; Engelen, Neumann, & Schmidt, 2016). Narcissism and psychopathy are officially classified as psychological disorders in the U.S. and Europe (e.g., in DSM 4 and 5) (Furnham, Richards, & Paulhus, 2013). However,

the entrepreneurial literature uses them to describe personality aspects that tend towards the clinical definition but do not necessarily fit this pathological description of narcissism.

In the following section, we focus on those traits most frequently addressed in entrepreneurship and introduced above (Kerr et al., 2017; Mueller & Thomas, 2001; Rauch & Frese, 2014). These are the Big Five personality model, the additional baseline traits innovativeness, self-efficacy, locus of control, need for achievement, and the Dark Triad.

4. Methodology

4.1 Data Collection

To answer our research question, we followed the guidelines set forth by Fisch and Block (2018). Therefore, we began by screening the existing literature. We collected the articles for this review in May of 2021, allowing us to take a snapshot of the literature on personality in crowdfunding. To obtain a comprehensive overview of literature on the topic, we did not limit our search to specific journals (Webster & Watson, 2002). Instead, we rely on the leading databases of the field, such as EBSCO Host, Scopus, and Web of Science. Our literature search involved four steps:

First, we searched the databases. For each of these we used the closest corresponding filter criteria available (abstract search in EBSCO Host, abstract and title search in Scopus, and topic search in Web of Science). For the search we combined the term "crowdfunding", "P2P lending", or "peer-to-peer lending" and one of the following terms on personality: "personality", "big five", "openness", "conscientiousness", "extraversion", "agreeableness", "neuroticism", "dark triad", "narcissism", "self-efficacy", "innovativeness", "locus of control", and "need for achievement". Table 3 provides further information on the search strings employed and the respectively resulting

number of articles. The initial search generated 20 unique EBSCO host articles, 65 unique Scopus articles, and 45 unique Web of Science articles resulting in 81 unique articles over all three platforms (removing duplicates).

Table 3: Initial Search

Search Term	EBSCO[1]	Scopus[1]	WoS[1]
crowdfunding AND personality	5	15	14
crowdfunding AND "big five"	1	4	2
crowdfunding AND openness	7	17	7
crowdfunding AND conscientiousness	0	4	1
crowdfunding AND extraversion	1	5	2
crowdfunding AND agreeableness	0	4	1
crowdfunding AND neuroticism	0	3	1
crowdfunding AND "dark triad"	0	0	0
crowdfunding AND narcissism	2	4	4
crowdfunding AND self-efficacy	2	8	7
crowdfunding AND innovativeness	7	25	14
crowdfunding AND "locus of control"	1	0	1
crowdfunding AND "need for achievement"	0	0	0
("peer-to-peer lending" OR "P2P lending") AND personality	0	1	3
("peer-to-peer lending" OR "P2P lending") AND "big five"	0	0	0
("peer-to-peer lending" OR "P2P lending") AND openness	1	2	1
("peer-to-peer lending" OR "P2P lending") AND conscientiousness	0	0	0
("peer-to-peer lending" OR "P2P lending") AND extraversion	0	0	0
("peer-to-peer lending" OR "P2P lending") AND agreeableness	0	0	0
("peer-to-peer lending" OR "P2P lending") AND neuroticism	0	0	0
("peer-to-peer lending" OR "P2P lending") AND "dark triad"	0	0	0
("peer-to-peer lending" OR "P2P lending") AND narcissism	0	0	0
("peer-to-peer lending" OR "P2P lending") AND self-efficacy	0	0	0
("peer-to-peer lending" OR "P2P lending") AND innovativeness	0	2	0
("peer-to-peer lending" OR "P2P lending") AND "locus of control"	0	0	0
("peer-to-peer lending" OR "P2P lending") AND "need for achievement"	0	0	0
Unique papers per Database	20	65	45
Unique papers across Databases		81	

[1]Search results from the 20.05.2021

In a second step, we screened all retrieved articles and included them in our review based on subject matter fit. We therefore excluded all articles with no clear focus on crowdfunding or on personality. We also exclude those studies that solely mention personality, but do not actually include one or more personality constructs or

crowdfunding in their research. In case of personality this exclusion criterion is complicated to assess because researchers often use the term personality to describe personal characteristics (e.g., optimism) rather than concrete personality constructs (e.g., agreeableness). To differentiate the papers that actually explore personality constructs in the context of crowdfunding from those that do not, we asked ourselves the following three questions while examining the papers:

(1) Do the search terms appear within the title, abstract, or keywords of the paper, or is it a mismatched result (i.e., where the terms do not really appear as expected)? For example, we excluded Borst et al. (2018) as none of our personality related terms were mentioned within the title, abstract, or keywords ("From friendfunding to crowdfunding: Relevance of relationships, social media, and platform activities to crowdfunding performance").

(2) Is personality/crowdfunding a *core concept* of the paper or just used as an example to research a related topic? For example, we excluded Gruda et al. (2021) as crowdfunding is just a concept to which the paper's results are compared (i.e. "We discuss and compare our findings to previous work on narcissism and crowdfunding." (Gruda et al., 2021, p. 1)); another example is the exclusion of Wang et al. (2017) who investigate sentiments rather than personality ("The study proves that positive sentiment in the blurb and detailed description promotes the successful campaigns" (Wang et al., 2017, p. 2)).

(3) Is the construct related to a person/group? For example, we excluded Ceballos et al. (2017) as product innovativeness is not a characteristic of the entrepreneur ("the innovativeness of a project, [...] can positively affect crowdfunding achievement." (Ceballos et al., p. 79)).

For the 81 articles, two researchers assessed the relevance of each article by screening the title, abstract, and keywords and by employing the three questions as additional fit criteria to decide on the relevance for the literature review. If the title, abstract, and keywords were insufficient to assess whether or not the article should be included in the review, the whole paper was read to reach a clear conclusion (8 articles, e.g., Shin & Lee, 2020). This rating method was conducted by two authors independently. In cases of disagreement (12 articles, e.g., Tseng, 2020), the articles were discussed until a consensus was reached. This procedure leads to the inclusion of 25 (out of 81) articles.

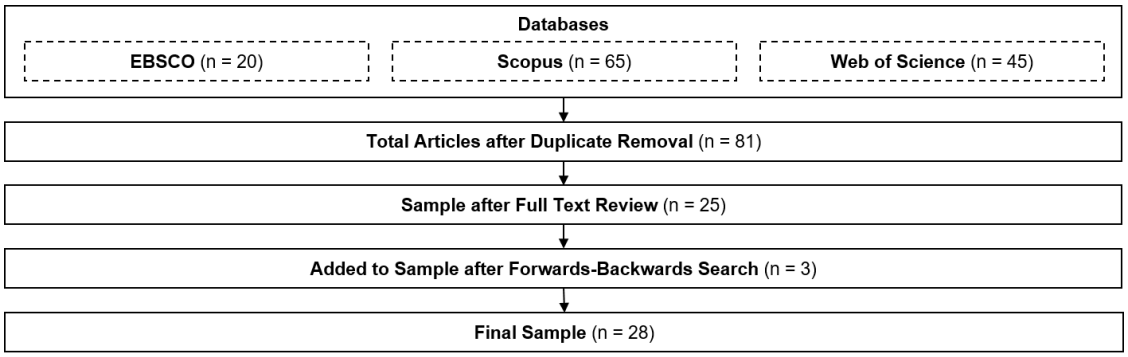
In the third step, we performed subsequent forward and backward searches, using both the reference lists of the articles and Google Scholar. We used the aforementioned criteria to assess the relevance of the retrieved articles, yielding three additional articles for our data set, for a total of 28.

As the last step, we also examined other literature reviews on crowdfunding. In these, however, the focus was mostly on general success factors (Alegre & Moleskis, 2019; Bouncken, Komorek, & Kraus, 2015; Butticé, Franzoni, Rossi-Lamastra, & Rovelli, 2018; Cai, Polzin, & Stam, 2021; Dalla Chiesa & Handke, 2020; Iurchenko, 2019; Jovanović, 2019; Kaartemo, 2017; Mochkabadi & Volkmann, 2020; Moleskis & Alegre, 2018; Moritz et al., 2015a; Salido-Andres, Rey-Garcia, Alvarez-Gonzalez, & Vazquez-Casielles, 2020; Shneor & Vik, 2020; Zhao & Ryu, 2020). Overall, personality was only mentioned as a success factor in one of the reviews (Butticé et al., 2018), which further illustrates the necessity of our work.

For our review, we only included articles written in English and published in peer-reviewed academic journals, research compilations or conference proceedings. The only exception to this was a dissertation on the Dark Triad by an expert in the field (Creek,

2018). Overall, our literature screening resulted in a collection of articles that very clearly examine crowdfunding and personality with a particular emphasis on the personality aspects we included in our search terms. The steps of the literature search and selection are summarized in Figure 1 below.

Figure 1: Systematic Process of Data Collection



4.2 Data Analysis

After carefully screening the articles, we decided on a topic-centered analysis. Therefore, we first collected classical descriptive data on the articles in our dataset (e.g., publication date, outlet, research method). We also identified and recorded topic-specific descriptive data; for example, we determined the crowdfunding type described in the articles (reward-based, equity-based, lending-based, or donation-based), categorized the theoretical approach (e.g., signaling theory, social identity theory), the methodologies utilized (e.g., questionnaire, narrative analysis, etc.), and the variables employed (e.g., Big Five personality, innovativeness) in more detail. We also identified the authors' perspectives on their investigation and categorized these as campaign owner-centered, investor-centered, or as a hybrid approach (Table 2). After the articles were categorized by one author using the citation management software Citavi, they were reviewed by another researcher without significant discrepancies after discussion.

For the content analysis, we followed the direction of our research question and best practices (e.g., Colombo, 2021; Jones, Coviello, & Tang, 2011; Mochkabadi & Volkmann, 2020). We analyzed (1) the results of the quantitative papers focusing on crowdfunding outcomes and (2) the limitations and future research opportunities suggested by the authors of the reviewed papers.

(1) We examined the subset of twelve quantitative papers focusing on crowdfunding success from our literature selection in more detail. First, for each quantitative study reviewed, we extracted the personality variables examined by the authors. We then supplement these variables with the personality constructs identified within the conceptual background and use them as the basis for our subsequent analysis in Table 4. We examined the findings of the quantitative analysis conducted in detail and extracted all significant and non-significant findings regarding personality variables. Next to these variables the findings were assigned to the crowdfunding type and success variable (e.g., funding success, amount raised, total backers) researched by the authors of the representing article (Table 4). As some authors examine multiple personality variables or different crowdfunding types simultaneously, one article can account for more than one effect displayed in Table 4. As before, one researcher conducted the assignment of the quantitative findings, followed by a review by another researcher and subsequent discussions to eliminate differing assessments.

(2) Next, we closely examined all studies' limitations and the suggested future research identified by the authors of all 28 articles. Hereby, we employed three steps, following a similar approach to that of Jones et al. (2011) for identifying and subsequently coding topic themes. First, we extracted the mentioned

limitations and future research sections for each paper. Second, we summarized these sections to reflect their key points (Table 5). One author conducted this step, followed by the mentioned review and discussion process with another researcher. Third, as future research opportunities are of particular interest to the scientific community, we then continued to cluster the mentioned research opportunities into categories. Therefore, two authors independently categorized the future research opportunities mentioned by the respective authors of the reviewed papers, clustering them by similarity (e.g., “We thus advise scholars to extend our work to alternative types of crowdfunding campaigns and platforms.” (Butticé & Rovelli, 2020, p. 5) and “future research can be extended to other form of crowdfunding, such as peer-to-peer lending” (Leonelli, Di Pietro, & Masciarelli, 2020, p. 55)). Next, we compared the clusters and resolved the remaining differences by reaching consensus between the authors (e.g., splitting the topic “perspectives” into the topics “perspective” and “context”). We next discussed and subsequently assigned topic and subtopic names to the five resulting clusters and twelve subclusters. In many cases, articles reviewed pointed out multiple future research opportunities (e.g., the use of alternate methods and variables, larger samples, etc.). Therefore, we counted some articles into more than one topic cluster (e.g., Butticé & Rovelli, 2020 state: "We thus advise scholars to extend our work to alternative types of crowdfunding campaigns and platforms" categorized in our topic "Context" and subtopic "Crowdfunding Type", but the authors also advise: "replicate our study on a subsample of entrepreneurs administering them the Narcissistic Personality Inventory" categorized in our topic "Methods" and subtopic "Approach" (Butticé & Rovelli, 2020, p. 5)). Figure 5 provides an

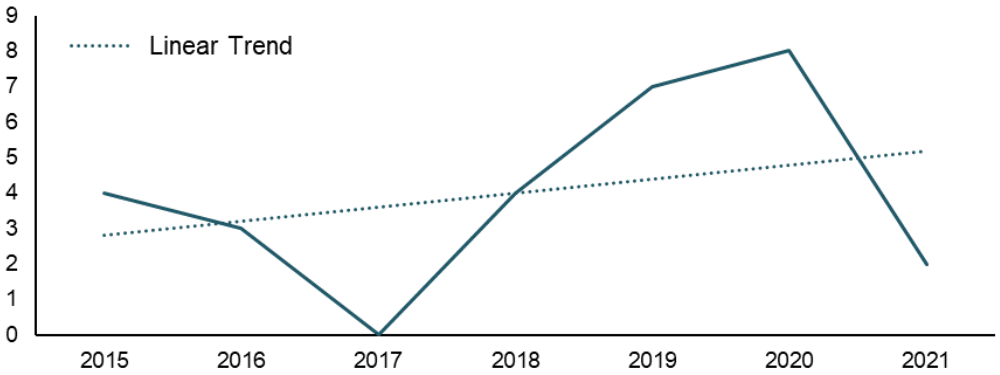
overview of how many of the reviewed articles mentioned one or more of the five future research topics.

5. Results

5.1 Descriptive Results

Our analysis spans 28 articles. These were published between 2015 and March 2021 with a low point of no published papers in 2017 and an increasing trend in more recent years (Figure 2).

Figure 2: Number of Publications per Year

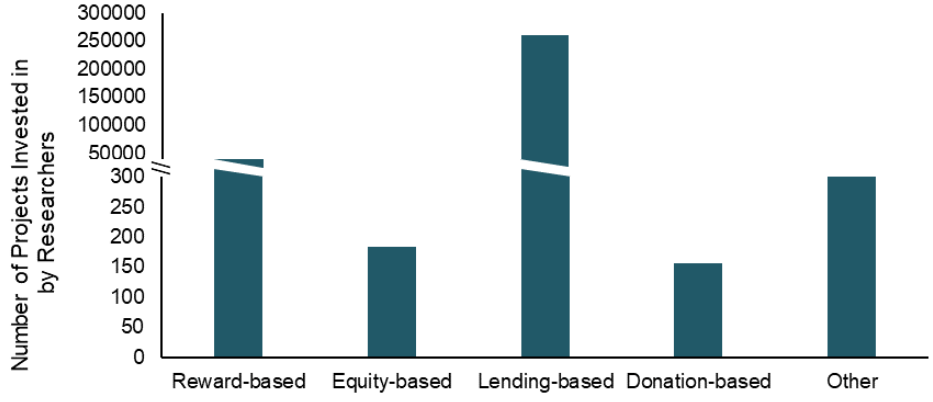


Our search returned papers focusing on the following personality constructs in line with our search terms: the Big Five in general (Bernardino & Santos, 2016; Davidson & Poor, 2015; Gera & Kaur, 2018; Kim & Hall, 2021; Kim, Hall, & Han, 2021; Rottler, Helmig, & Ahrens, 2020; Ryu & Kim, 2016; Thies et al., 2016a), only openness (Moritz et al., 2015a), only conscientiousness (Moss, Neubaum, & Meyskens, 2015; Short & Anglin, 2019), only extraversion (Netzer, Lemaire, & Herzenstein, 2019) the Dark Triad (Creek, 2018; Leonelli et al., 2020), only narcissism (Anglin et al., 2018b; Bollaert et al., 2019; Butticé & Rovelli, 2020), self-efficacy (Harburg et al., 2015; Macht & Chapman, 2019; Shneor & Munim, 2019; Stevenson, Ciuchta, Letwin, Dinger, & Vancouver, 2019; Troise & Tani, 2020), innovativeness (Calic & Shevchenko, 2020; Moss et al., 2015;

Rodriguez-Ricardo, Sicilia, & Lopez, 2019; Shin & Lee, 2020; Short & Anglin, 2019; Tseng, 2020), and locus of control (Rodriguez-Ricardo et al., 2019). Also, the broad search for the term "personality" in general also revealed additional traits investigated by researchers in the context of crowdfunding: risk-taking (Moss et al., 2015; Short & Anglin, 2019), autonomy (Calic & Shevchenko, 2020; Moss et al., 2015; Short & Anglin, 2019), as well as charisma and hubris (Sundermeier & Kummer, 2019). The crowdfunding literature does not yet reflect the term “need for achievement” as a personality construct.

In 17 of these articles, authors primarily investigate personality aspects in reward-based crowdfunding rather than in other crowdfunding types (Table 4). This trend might be due to the easy accessibility of Kickstarter data via openly available tracking platforms such as Kickspy. It is also noteworthy that both reward- and lending-based crowdfunding permit the authors to use larger samples of campaign data (on average) compared to donation-based and particularly equity-based forms of crowdfunding (Figure 3).

Figure 3: Average Examined Campaigns per Crowdfunding Type*

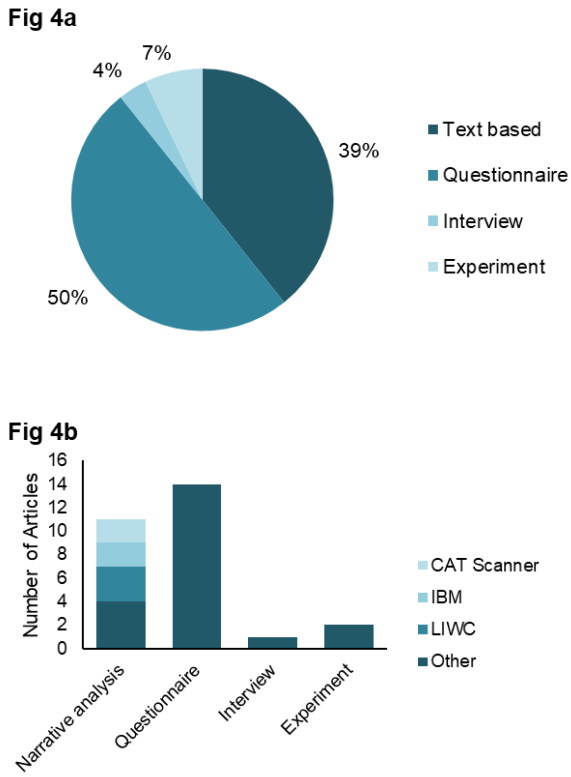


*Please note that a broken y-axis is used to include all average sample sizes in one figure.

The methods used within the selected papers are based on questionnaires, narrative analysis, experiments, and interviews (Figure 4a). Most of the articles are based

on methods that focus on questionnaires or the text of a given campaign. The software tools most frequently employed for narrative analysis conducted in 11 articles are Linguistic Analysis and Word Count (LIWC) and CAT Scanner. Further, two authors used the artificial intelligence-based tool IBM Personality Insights (Figure 4b).

Figure 4: Approach: Percentage Distribution and Investigation Method



Of the 28 articles, only three base their research on qualitative approaches. These conducted semi-structured interviews in two cases (Harburg et al., 2015; Moritz et al., 2015a) and in the third case coded comments on crowdfunding pages regarding e.g., moral support provided by the investors (Macht & Chapman, 2019). The remaining articles follow a quantitative approach largely based on regression models (Table 4).

The authors of the articles selected for our review employ a number of theories. Three articles base their research on Signaling Theory (Spence, 1978). Social Role

Theory (Eagly & Wood, 2012) and Self-Determination Theory (Deci & Ryan, 2008) were also used by more than one author team. Additional theories utilized in the articles can be derived from Table 4.

Regarding the perspective taken in the articles, across all 28 studies, 18 focus on the entrepreneur's or campaign creator's view. Nine articles take the investor perspective. Strikingly, only one author team took a more comprehensive approach (Moritz et al., 2015a) by investigating all parties involved: the entrepreneurs, investors, and any third parties involved, e.g., platform representatives (Table 4).

Table 4: Literature Included in the Review

Author(s)	Type	Approach	Method	Theoretical Approach	Personality Perspective
Anglin et al., 2018b	Reward	Quantitative	Multilevel GLM, multilevel logistic	Social Role Theory	Campaign owner-centered
Bollaert et al., 2019	Reward	Quantitative	OLS regression	No theory mentioned	Campaign owner-centered
Butticé & Rovelli, 2020	Reward	Quantitative	Probit models	Social Role Theory	Campaign owner-centered
Calic & Shevchenko, 2020	Reward	Quantitative	Logistic and OLS regression	Signaling Theory, Entrepreneurial Orientation	Campaign owner-centered
Davidson & Poor, 2015	Reward	Quantitative	OLS regression	No theory mentioned	Campaign owner-centered
Gera & Kaur, 2018	Reward	Quantitative	Logistic regression	No theory mentioned	Campaign owner-centered
Harburg et al., 2015	Reward	Qualitative	Semi-structured interviews	Social Cognitive Theory	Campaign owner-centered
Macht & Chapman, 2019	Reward	Qualitative	Not clearly specified	Psychological Capital*	Campaign owner-centered
Rodriguez-Ricardo et al., 2019	Reward	Quantitative	Structural equation modeling (SEM)	Self-Determination Theory	Investor-centered
Rottler et al., 2020	Reward	Quantitative	GLM	Socioanalytic Theory	Campaign owner-centered
Ryu & Kim, 2016	Reward	Quantitative	Cluster analysis, ANOVA	Self-Determination Theory	Investor-centered
Shin & Lee, 2020	Reward	Quantitative	Hierarchical regression	No theory mentioned	Investor-centered
Shneor & Munim, 2019	Reward	Quantitative	SEM	Theory of Planned Behavior	Investor-centered
Short & Anglin, 2019	Reward	Quantitative	Multilevel regression, multilevel logistic regression	No theory mentioned	Campaign owner-centered
Sundermeier & Kummer, 2019	Reward	Quantitative	ANCOVA	Dual-Process Theory	Campaign owner-centered
Thies et al., 2016a	Reward	Quantitative	OLS regression	Signaling Theory	Campaign owner-centered

Tseng, 2020	Reward	Quantitative	Partial least squares approach to SEM (PLS-SEM)	Expectation-Confirmation Theory	Investor-centered
Creek, 2018	Reward, Equity	Quantitative	Regression	Social Exchange Theory, Life History Theory	Campaign owner-centered
Leonelli et al., 2020	Equity	Quantitative	OLS regression	No theory mentioned	Campaign owner-centered
Moritz et al., 2015a	Equity	Qualitative	Semi-structured interviews	Information Asymmetry*	Hybrid approach
Stevenson et al., 2019	Equity	Quantitative	Path analysis, Chow tests	Control Theory	Investor-centered
Troise & Tani, 2020	Equity	Quantitative	PLS-SEM	Entrepreneurial Decision-Making Theory	Campaign owner-centered
Moss et al., 2015	Lending	Quantitative	Cox proportional hazards	Signaling Theory	Campaign owner-centered
Netzer et al., 2019	Lending	Quantitative	Binary logit model	No theory mentioned	Campaign owner-centered
Bernardino & Santos, 2016	Donation	Quantitative	Logistic regression	No theory mentioned	Campaign owner-centered
Rodriguez-Ricardo, Sicilia, & López, 2018	Donation	Quantitative	SEM	Social Identity Theory	Investor-centered
Kim & Hall, 2021	no differentiation	Quantitative	PLS-SEM	Value-Attitude-Behavior Theory	Investor-centered
Kim et al., 2021	no differentiation	Quantitative	PLS-SEM	Personality Theory	Investor-centered

*Theoretical scaffolding

5.2 Results of the Thematic Analysis

For a more in-depth thematic analysis, we set two priorities. First, we summarized the results of the three qualitative studies. Second, we categorized previous quantitative studies in a way that can be easily utilized by future authors. Third, we summarize and categorize what other authors consider to be the essential future research steps in personality research on crowdfunding.

5.2.1 Summary of the Qualitative Articles Reviewed

Three out of the 28 research papers within this literature review are qualitative in nature (Table 5). First, the qualitative-empirical study of Moritz et al. (2015) inductively investigates the role of investor communication as a medium for overcoming information asymmetries. Therefore, the authors conducted 23 interviews with investors,

representatives of new ventures, and third-party stakeholders such as platform operators. The study finds that within the crowdfunding process, personal communication is replaced by pseudo-personal communication via the Internet and that communicating soft personality factors, e.g., openness is vital to reduce perceived *information asymmetry*, i.e., when one party has more (private) information than the other. In so doing, the authors took the perspective of different participants in the crowdfunding process and thereby provided the only paper that simultaneously investigates multiple perspectives and goes on to build theory from cases.

Second, Harburg et al. (2015) investigate the influence of crowdfunding ecosystems on the entrepreneurs' self-efficacy. The authors thereby conducted 53 semi-structured interviews and rely on Bandura's *social cognitive theory* (Bandura, Freeman, & Lightsey, 1999)– which maintains that people's knowledge acquisition is based on observing others in social context and the media. Therefore, the study is clearly deductive in nature. The authors report that entrepreneurs gain self-efficacy via the received feedback and number of backers supporting them, metrics showing their progress on the funding page, and examples of succeeding entrepreneurs. Nevertheless, the entrepreneurs' self-efficacy can also decrease when facing a lack of public validation or their project fails in front of the crowd (e.g., experiencing shame).

Third, Macht and Chapman (2019) also examine self-efficacy supplemented by other psychological capital aspects like optimism and resilience in the context of crowdfunding. Their qualitative interpretative work investigates the associations between the crowds' comments within a given campaign and fund seekers' human, social, and psychological capital. By coding and thematically analyzing 475 comments from ten crowdfunding campaigns (examining only those with a minimum of 30 comments in a

selection process that can at best be described as semi-random), the authors core finding is that the crowd can increase the entrepreneurs' self-efficacy, hope, optimism, and resilience by providing support and by showing support and criticism within their comments. The generalizability of this finding is limited, given the moderate sample size. Also, the methodology used is not clearly specified and it is unclear if this work is inductive or rather a more deductive approach that begins with psychological capital and goes on to "test" this qualitatively.

With the exception of the study of Moritz et al. (2015), the qualitative studies focus not on the personality displayed within the crowdfunding process but on gaining self-efficacy via the crowdfunding process itself. While the degree to which an individual's personality can change through a single crowdfunding campaign may be questionable, these studies focus on an angle of personality in crowdfunding that has clearly been neglected by the other studies within this literature review. Thereby, such qualitative studies can help explore future research avenues not yet represented in the body of literature.

Table 5: Summary of Quantitative Results by Crowdfunding Type

Author(s)	Principle Topic	Sample Size and Type	Sampling Procedure	Method Used	Theory Employed
Moritz et al., 2015a	investor communication	23 semi-structured interviews: 12 investors, 6 new ventures and 5 third parties (mostly platform operators)	mix of selective and snowball sampling	exploratory qualitative inductive, theory-building from cases	Information Asymmetry*
Harburg et al., 2015	self-efficacy	53 semi-structured interviews	snowball sampling	structured quantitative (thematic) analysis (largely deductive)	Social Cognitive Theory
Macht & Chapman, 2019	self-efficacy	10 crowdfunding campaigns (475 comments)	semi-random' with cutoff at >=30 comments	qualitative interpretive (not clearly inductive)	Psychological Capital*

*Theoretical scaffolding

5.2.2 Categorization of Results of the Quantitative Articles Reviewed

Only twelve articles quantitatively analyze the effects of personality on campaign outcomes. We focus on the independent personality variables reflected by the papers retrieved in our literature search. The outcome of a campaign is measured either by a dummy variable for success (goal reached yes/no), the actual amount raised (a continuous variable), the number of contributors to a campaign (as a count variable), or a combination of these three.

Three articles study the Big Five traits (Gera & Kaur, 2018; Rottler et al., 2020; Thies et al., 2016a) and two additional studies examine the single Big Five trait conscientiousness (Moss et al., 2015; Short & Anglin, 2019). The authors find strong evidence for a positive impact of openness on crowdfunding success and suggest a positive influence of agreeableness and extraversion and a negative influence of neuroticism (Gera & Kaur, 2018; Rottler et al., 2020; Thies et al., 2016a). It is noteworthy that for most Big Five factors, the authors do not report similar findings, but find both significant and non-significant effects. Only openness and its positive influence on campaign success in reward-based crowdfunding seems to be a robust relationship across the quantitative studies reviewed (Table 6).

Focusing on the Dark Triad, we see that while existing results for other crowdfunding types often contradict each other, in some cases there are clear tendencies, such as for the negative but inverse u-shaped effect of narcissism on crowdfunding success (even across different measures of success). Although the articles report no significant results for Machiavellianism, they report some evidence for the effects of psychopathy. For example, Creek (2018) finds a positive relationship between the amount

raised and psychopathy in equity-based crowdfunding, contrary to the opposite finding of Leonelli et al. (2020) regarding campaign success.

Finally, we report our findings on the study of the additional (frequently used) personality traits within the identified crowdfunding literature. First, Shneor and Munim (2019) find an indirect effect of self-efficacy in reward-based crowdfunding, in particular a significant influence on their mediator variable "financial contribution intention". Second, Short and Anglin (2019) find a significant negative effect of innovativeness on the amount raised, and Calic and Shevchenko (2020) find positive but also significant inverted u-shaped relations for innovativeness in all three crowdfunding performance measurements (success, amount raised, and number of backers). Both studies were conducted in a reward-based crowdfunding setting. Third, some authors find that risk-taking entrepreneurs succeed more often in lending-based crowdfunding campaigns (Moss et al., 2015), while Calic and Shevchenko (2020) report inverted u-shaped relationships between risk-taking and campaign success in reward-based crowdfunding. Further, it is noteworthy that, while risk-takers are more likely to receive crowdfunded loans, they are less likely to succeed with other types of crowdfunding. Fourth, autonomy negatively affects the amount raised in reward-based crowdfunding (Short & Anglin, 2019) and shows an inverted u-shaped relation across all performance measurements (Calic & Shevchenko, 2020). In lending-based crowdfunding, however, Moss et al. (2015) report a positive effect of autonomy.

Table 6: Summary of Quantitative Results by Crowdfunding Type

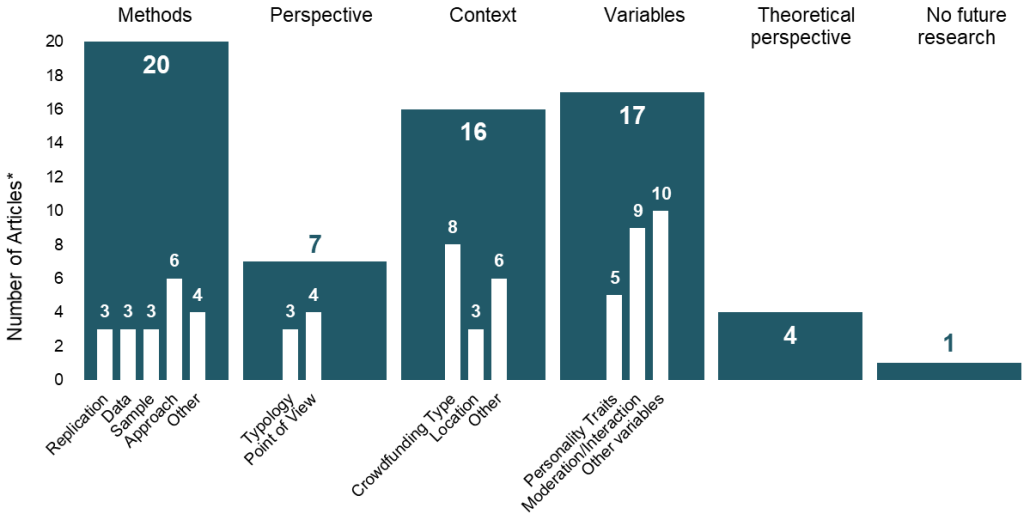
Personality Trait	Success (0/1)				Amount Raised				Number of Backers				Author(s)
	RB	EB	DB	LB	RB	EB	DB	LB	RB	EB	DB	LB	
Big Five													
Openness	↑				↑				↑				Gera & Kaur, 2018; Rottler et al., 2020; Thies et al., 2016a
Conscientiousness	↑↓			↑	↑↑				↑↑				Gera & Kaur, 2018; Moss et al., 2015; Rottler et al., 2020; Short & Anglin, 2019
Extraversion	↑↑				↑				↑				Gera & Kaur, 2018; Rottler et al., 2020; Thies et al., 2016a
Agreeableness	↑↓				↑				↑				Gera & Kaur, 2018; Rottler et al., 2020; Thies et al., 2016a
Neuroticism	↓↓				↓				↓				Gera & Kaur, 2018; Rottler et al., 2020; Thies et al., 2016a
Dark Triad													
Narcissism	↓∩	↓∩			↓∩				↓∩				Anglin et al., 2018b; Bollaert et al., 2019; Butticé & Rovelli, 2020; Creek, 2018; Leonelli et al., 2020
Machiavellianism		↓∩			↓								Creek, 2018
Psychopathy	↓				↓	↑							Creek, 2018; Leonelli et al., 2020
Other Traits													
Self-efficacy					(↑)*								Shneor & Munim, 2019
Innovativeness	↑∩↓				↑↓∩↑				↑↓∩				Calic & Shevchenko, 2020; Moss et al., 2015; Short & Anglin, 2019
Risk-Taking	∩↓			↑	↑∩↓				∩↓				Calic & Shevchenko, 2020; Moss et al., 2015
Autonomy	∩↑			↑	↑∩↑				↑∩↑				Calic & Shevchenko, 2020; Moss et al., 2015

RB (reward-based), EB (equity-based), DB (donation-based) and LB (lending-based)
↑/↓ for linear results; ∩ for inverted U-shaped relations; ↑/↓/∩ directions of insignificant results
* Indirect effect via mediator

5.2.3. Analysis of the Future Research Sections

The analysis of the critical gaps for future research in personality and crowdfunding is based on all 28 articles included in the literature review. Table 7 provides detailed insights into what the representative authors identified as limitations in their articles and how they would like to see future research evolve to address these concerns. We summarize, categorize and quantify the individual statements in Figure 5.

Figure 5: Future Research Suggestions from the Articles Reviewed categorized in Topics and Subtopics



*Number of articles in a subtopic may add up to more than the number of articles within a topic as some articles point out multiple future research opportunities (e.g., the use of alternate methods and variables, larger samples, etc.)

Overall, we found that first, the authors call for future studies that employ more comprehensive methods (e.g., other approaches or larger sample sizes). Second, the inclusion of more variables is important for the authors to reduce omitted variable bias and endogeneity concerns. Many of them suggest including not only additional controls, but further constructs such as trust, credibility, commitment, and intention (Gera & Kaur, 2018). Third, nearly equally frequently, authors request future authors to the transfer their analysis to other contexts, such as to other types of crowdfunding. Sixteen articles mentioned this aspect, whereby eight specifically refer to shifting the focus from one crowdfunding type to another. Finally, other ideas for future research identified across the articles are: a change of perspective, for example by investigating other stakeholders, and the inclusion of other theories, e.g., Social Capital Theory or Social Cognitive Theory (Bandura et al., 1999; Shneor & Munim, 2019).

Table 7: Limitations and Future Research Derived from the Literature

Author(s)	Limitations	Future Research
Anglin et al., 2018b	· Limitations of text based approach · Moderating variables effect on narcissism · Impression management as thread for the results	· Mechanisms linking narcissistic personality and rhetoric · Influence of other personality traits · Use of narcissism between different demographics · Components of narcissism
Bernardino & Santos, 2016	· Small sample size · Cross-sectional design limits results	· More/other dependent variables · Influence of personality traits on decision, risk, trust, etc. · Other countries
Bollaert et al., 2019	· No limitations mentioned	· Other crowdfunding models
Butticé & Rovelli, 2020	· Only reward-based crowdfunding · Reliance of narcissism measurement	· Other crowdfunding models · Combine with other approaches (questionnaire)
Calic & Shevchenko, 2020	· Limitations of text based approach	· Use built dictionary · Longitudinal studies · Innovativeness in crowdfunding · Other crowdfunding models
Creek, 2018	· Limited to US data · Only successful campaigns · Lack of control variables	· Test successful and unsuccessful campaigns
Davidson & Poor, 2015	· Small sample size · Not representative sample	· Measure by content analyzing · Analyze interaction with backers · Analyze cultural worker's attitude · Longitudinal data · Attitude vs. actual use of crowdfunding
Gera & Kaur, 2018	· Limitations of text based approach	· Influence of personality traits on trust, credibility, commitment, intention, etc.
Harburg et al., 2015	· No limitations mentioned	· Use additional quantitative methods · Include more variables · Run further controlled experiments
Kim & Hall, 2021	· Limited to Korean data · Data generated during COVID-19 pandemic · Focus on consumers who'd already participated in crowdfunding	· Examine the influence of crisis on investments · Focus on non-participants of crowdfunding
Kim et al., 2021	· Limited to Korean data · Data generated during COVID-19 pandemic	· Examine the influence of crisis on investments · Employ different research methods (e.g., big data and AI analysis) · Future research on the personality of the entrepreneur
Leonelli et al., 2020	· Limited to UK data · Only equity-based crowdfunding	· Relationship with other forms of finance · Other crowdfunding models · Other countries · Replication
Macht & Chapman, 2019	· Extreme cases are not considered qualitative research might be subjective · No representative sample · Based on secondary data	· Investigate in extreme cases · Larger sample size · Include researches from different backgrounds
Moritz et al., 2015a	· No limitations mentioned	· Pseudo-personal communication and social medias effect on reducing information asymmetry · Extend to other type of crowdfunding

		· Influence of platform business model on communication of the venture · Heterogeneity of investors and implications for communication
Moss et al., 2015	· Only perceived not real behavior · Limitations of text based approach · Only lending-based crowdfunding · Question of practical relevance	· Access role of the lender · Impact of investments · Interaction of counterparties · Other regions · Focus on the entrepreneurs / their situation
Netzer et al., 2019	· No limitations mentioned	· Different populations · Other types of unsecure loans · Extend to other types of media · Extend to other types of industry / behavior
Rodriguez-Ricardo et al., 2018	· Did not specify the type of crowdfunding · Perspective of fund seekers or platforms not included	· Moderating effect of business type · Include all three actors (crowdfunders, fund-seekers and platforms)
Rodriguez-Ricardo et al., 2019	· Specify crowdfunding context · Include previous crowdfunding experience · Only intentional behavior measured · Self-report data	· Empirical measures from crowdfunding platforms · Combine intrinsic and extrinsic motivation
Rottler et al., 2020	· Decision bias	· Investigate in interaction effects · Include additional variables (e.g., other signals) · Employ multi-method approaches (e.g., qualitative methods, eye-tracking) · Narrow-facet level of personality
Ryu & Kim, 2016	· Examined only existing sponsors	· Effects of cross-network externalities to generate new sponsors · Examine factors of sponsor loyalty · Typology of crowdfunding creators · Interaction between creators and sponsors · Preferred project per type of sponsor · Relationship between motivation and behavior · Examine other platform characteristics and their effect · Investigate moderating factors
Shin & Lee, 2020	· Survey conducted with college/graduate students · Only reward-based crowdfunding · Study referred to a well-known platform	· Examine various consumer groups · Include more control variables (e.g., prejudice, commerce characteristics) · Create a consistent questionnaire environment · Include other types of crowdfunding
Shneor & Munim, 2019	· Generalizability beyond the national and platform · Only reward-based crowdfunding · Only one method · Only self-reports	· Longitudinal data · Previous (crowdfunding) experience · Other crowdfunding models · Alternative theoretical frameworks (e.g., technology acceptance model, social capital theory and social cognitive theory
Short & Anglin, 2019	· No limitations mentioned	· Replications
Stevenson et al., 2019	· No limitations mentioned	· Self-efficacy in other entrepreneurial context
Sundermeier & Kummer, 2019	· Selection bias	· No future research mentioned
Thies et al., 2016a	· Limitations of text based approach · Probably not transferable (context specific) · No information on the other aspects of text / video	· Validate in other settings · Fine grained classification of personality · Combine with other approaches (questionnaire)

	· Only broader traits · Transparency of IBM	
Troise & Tani, 2020	· Examine other parameters · Larger sample size	· Relation of self-efficacy in equity crowdfunding to emotions, cognitive parameters, capabilities and environment · Larger sample size · Replication of the study · Use more engaging methodology
Tseng, 2020	· Limited to Taiwan data · Selection bias · Missing control variables (e.g., residential area, occupation)	· Use better sampling techniques
	·	·

6. Discussion

Personality is an important and under-researched topic in entrepreneurial finance, especially in the crowdfunding context, expressed in a growing body of research that has peaked in 2020. In this literature review, we retrieved articles focusing on nearly every personality construct included in the search terms (except for the "need for achievement"). Further, the more generalized search term "personality" uncovered additional personality constructs, which are risk-taking (Calic & Shevchenko, 2020; Moss et al., 2015), autonomy (Calic & Shevchenko, 2020; Moss et al., 2015), and traits associated with charisma and hubris (Sundermeier & Kummer, 2019). Risk-taking describes the tendency to make risky decisions in the presence of uncertainty (Knight, 1921); autonomy stands for the need for independence. Charisma and hubris combine personality traits attributed to entrepreneurs, such as excessive pride and self-confidence (hubris) or charm and persuasion (charisma) (Sundermeier & Kummer, 2019).

We further find that within studies that focus on the Dark Triad, more studies cover narcissism than psychopathy or Machiavellianism. This difference could be rooted in the relatively high salience of the narcissism construct in narratives relative to the other traits. However, the popular and well-known measurement of narcissistic rhetoric introduced by (Chatterjee & Hambrick, 2007), while measuring CEO narcissism, might also be why many researchers focus on this trait.

6.1 Gaps and Future Research

In the following, we discuss key findings from our results in order of importance. We thereby not only examine the results of the quantitative articles included in the analysis of personality effects on crowdfunding performance but combine these with the literature gaps identified by all articles included in the review. Therefore, we take a closer look at personality traits as non-linear, the use of narrative analysis methods, the context dependency of personality research in crowdfunding, and the specific personality perspective taken by the authors.

6.1.1 Personality as Non-Linear

Apart from the rather consistent results for openness and narcissism, the results differ from article to article and show no consistent pattern (Table 6). However, it is important to mention the inverted u-shape that authors often find for several personality traits. Miller (2015) argues convincingly that personality attributes are Janus-faced and that the negative aspects of the entrepreneurial personality have been largely ignored so far. Similarly, Calic and Shevchenko (2020) conclude that personality components such as innovativeness or risk propensity can be perceived as desirable by investors to a certain degree but lose their positive appeal when over-expressed and hence are subject to a threshold effect. Although such nonlinear relationships appear to make sense when investigating personality in a complex context like crowdfunding, only a few authors analyze nonlinear relationships (e.g., quadratic relations) and surprisingly none mention this approach as potential for future research. We nevertheless argue that future research must pay special attention to these findings by testing for or including quadratic terms when examining personality effects in crowdfunding. A research question focusing on this non-linear relationship could entail: *Do personality traits displayed in crowdfunding*

campaigns reach a saturation point at which they are overexpressed and consequently diminish the engagement/contribution level of the crowd? Answering this question would resolve inconsistencies in the current literature and fill a research gap regarding potentially underexplored quadratic effects of expressed personality in crowdfunding. Further, it would contribute to research on the effects of perceived personality expressions on impression formation (Hamilton, Katz, & Leirer, 1980). In practice, answering this question would also help crowdfunding entrepreneurs evaluate campaign material (e.g., videos) in a more nuanced way.

6.1.2 Use of Different Methods

Eleven of the studies examined base their research on software-based text analysis methods which are increasingly popular in entrepreneurship research, particularly so in studies related to personality. The perks are undeniable: employing this method facilitates access to larger samples that were not previously accessible. Using these methods, researchers rely on publicly available online text snippets such as letters to shareholders, IPO prospectuses, tweets, campaign page text, and even transcribed voice and video recordings, e.g., manager earning calls (Aerts & Yan, 2017; Golbeck, Robles, Edmondson, & Turner, 2011 - 2011; Harrison et al., 2019; Loughran & McDonald, 2013). However, the disadvantages of such methods should not be underestimated. On the one hand, there is the problem of validity. The methods employed are often validated only based on self-written imaginary text, generated in experimental settings and not on topic-specific text with an economic focus (Mairnesse et al., 2007; Pennebaker & King, 1999). On the other hand, campaign pages' texts are not necessarily authored by the entrepreneurs themselves, although assumed by this method of text-based personality assessment. It is also possible, that third parties such as public relations firms are hired to

craft the campaign text on behalf of the entrepreneur or startup team. Analyzing these campaign texts, we must question whether the traits measured actually capture the campaign creator's personality.

So, what do these studies actually measure? Some authors argue that they might have measured *perceived* personality rather than the entrepreneurs' true personality (Moss et al., 2015). Often, researchers are simply interested in the impact of personality traits as perceived by investors on crowdfunding success and do not require knowledge about the true underlying personality of the entrepreneur. As long as the studies find a correlation between the measured construct and crowdfunding success, the results suggest that the method is functioning as intended. Also, perceived personality could be a valid measure for a number of research questions, because investors are limited to the information presented on the campaign page. For instance, this could be the case for big data researchers or in entrepreneurial finance (Harrison et al., 2019), but may not be the case for psychologists that study personality in more personal context (Bozionelos, 2017). In cases where the true personality of an entrepreneur is needed to answer a particular research question, text-based methods along with the stated limitations regarding perceived personality could present a real challenge. Future research could tackle this issue by combining, e.g., different methods such as combining text-based methods with psychological questionnaires as argued by Butticé and Rovelli (2020). Also, other studies analyzed within this paper highlight the need for the use of different methods while investigating personality in the crowdfunding context (see Table 7). Letting some of these authors speak for themselves they “encourage future researchers in crowdfunding to analyze empirical measures from crowdfunding platforms” (Rodriguez-Ricardo et al., 2019, p. 12), argue that “qualitative and quantitative tools” (Davidson & Poor, 2015,

p. 303) are needed in this research area, and emphasize that including e.g., questionnaires in their research model "would contribute to add reliability to our study and to rule out possible alternative explanations" (Butticé & Rovelli, 2020, p. 5). An unanswered research question focusing on the combination of different personality measurements, therefore, is: *Does a narrative analysis of crowdfunding campaign texts reveal similar personality trait expressions as validated personality questionnaires conducted by the campaign owners?* Research focusing on this question could contribute to the ongoing debate on the effect of individual-level attributes of the entrepreneur on campaign success. Revealing if the effect of perceived personality outweighs the effect of inner personality (or vice versa) in terms of venture financing success in crowdfunding could monumentally influence crowdfunding practice as entrepreneurs can shape their narratives, and by extension, their impressions on people, but their internal personality is more or less fixed (Costa & McCrae, 1988).

6.1.3 Context Dependence

Due to the newness of the crowdfunding research field and the use of highly recent methodologies still under development, there are few studies in general and even fewer replication studies in this area. Only one article intentionally replicates the work of another author team (Short & Anglin, 2019). In their article, the authors conclude that "individuals should exercise extreme caution in regard to assuming that findings in one context can be generalized to others" as they "failed to replicate any of the hypotheses where the authors originally found support" in one of the included replication studies (Short & Anglin, 2019, p. 12). This comment by Short and Anglin (2019) is strikingly similar to what we actually observe in our review of studies in this field. Trying to summarize the relationships tested by the quantitative studies on personality and

crowdfunding campaign success does not result in a clear picture (see Table 6). Instead, many studies find no effects, where others find effects or even contradictory results (e.g., Creek, 2018; Leonelli et al., 2020).

One reason for this could lie in the different settings of the studies. Short and Anglin (2019) replicated the study by Moss et al. (2015) in a reward-based crowdfunding context whereas it was initially conducted with lending-based crowdfunding data. With this change in settings there are also implicit changes in the basic features of the investigated construct, such as investor motivation. For example, while investors in reward-based crowdfunding are often assumed to be intrinsically motivated, investors in other crowdfunding types might behave differently (Cholakova & Clarysse, 2015).

Further, it is somewhat puzzling why studies that measure the same constructs in similar settings obtain different results. For example, even in studies conducted in the same setting, e.g., reward-based crowdfunding and studying the same relationship, e.g., between perceived Big Five personality traits of entrepreneurs and campaign success and on the same platform (often Kickstarter), the results can differ (Gera & Kaur, 2018; Thies et al., 2016a). Although addressing a similar research question, there are striking differences in the methodologies of the full paper by Thies et al. (2016) and the short paper by Gera and Kaur (2018). First, the text used for the calculations in Thies et al. (2016) included the campaign text and the campaign description separately with similar results. On the other hand, Gera and Kaur (2018) use campaign descriptions and profile descriptions from the campaign owners. Second, whereas Thies et al. (2016) base their analysis on a regression model, Gera and Kaur (2018) (although mentioning logistic regressions) report only correlations as results. Third, Thies et al. (2016) analyze 33,420 campaign texts and 12,859 video transcripts, while Gera and Kaur (2018) do not include

videos but instead opted to analyze a smaller number of 4059 campaign descriptions and 1721 creator profiles. Fourth, both author teams include different control variables in their analysis. Fifth, using a different time period to obtain the data and regulatory changes could cause systematically different results (Pollack et al., 2021). The example of these two papers (Gera & Kaur, 2018; Thies et al., 2016a), which appear similar at first, illustrates the problems that future researchers could solve by conducting replication studies. It is undeniable that personality constructs affect crowdfunding outcomes, but since the strength of the influence depends on the circumstances, researchers must pay particular attention to such details.

Therefore, we think that replication studies are particularly important for future research to determine differences in the effects of personality. First, replications are needed across types of crowdfunding and different platforms to observe the effect of this contextualization. This point was made by eight articles included in this research (Figure 5; e.g., Bollaert et al., 2019; Leonelli et al., 2020) Second, even when the type of crowdfunding and platform are held constant, such replication studies are crucial to generate a reliable knowledge base about the relationships between personality constructs and crowdfunding outcomes. Third, as cultural and geographic factors could also influence crowdfunding outcomes, authors should consider including different regions in their studies as suggested by Bernardino and Santos (2016) and others (Table 7). A specific research question is: *Which context-dependent variables moderate the effects of personality on crowdfunding?* Answering this question could change how entrepreneurial science sees crowdfunding in that the role of personality could illustrate how the different types of crowdfunding might differ from each other more than they do from other forms of venture finance. Entrepreneurial displays of agreeableness to an audience of equity

crowdfunding investors could have more implications for angel investments or IPOs than for reward-based crowdfunding and thereby open the opportunity for researchers to transfer findings from the accessible crowdfunding context to more traditional investment settings. Also, the scientific community could learn more about the role of individual crowdfunding platforms within a given type of crowdfunding (e.g., StartEngine and Wefunder for equity crowdfunding) in shaping the effect of individual characteristics like personality on campaign outcomes. Finally, we could also learn more about the role of national culture or geographic context in shaping how personality factors leading to crowdfunding success. This knowledge could help entrepreneurs who are thinking about entering new markets or expanding across borders.

6.1.4 Change of Personality Perspective

In the literature reviewed, we see a focus on studying the personality of the entrepreneur who is assumed to be the campaign creator. Studies on investors' personality, on the other hand, are less frequently conducted, even though there are relatively easy to investigate by survey studies while entrepreneurs are more difficult to access directly regarding their personality (Hambrick & Mason, 1984). Studies on investors' personality typically use inventory-based questionnaires (Rodriguez-Ricardo et al., 2019; Shneor & Munim, 2019), but have so far neglected studying investor comments for example. There have, however, been studies that investigate investor comment sentiment (Wang, Li, Liang, Ye, & Ge, 2018) which seems to be leading in a fruitful direction.

Only a few of the articles reviewed focus on the investor personality perspective. They find that social identification with the crowdfunding community and the individual level of innovativeness, unlike internal locus of control, positively affect the intention to participate in crowdfunding (Rodriguez-Ricardo et al., 2018; Rodriguez-Ricardo et al.,

2019). Further, Ryu and Kim (2016) categorize crowdfunders into four groups (angelic backers, reward hunters, avid fans, tasteful hermits) employing various factors including the Big Five personality traits, whereas Shneor and Munim (2019) find differences in self-efficacy between investors that contribute higher vs. lower amounts to campaigns.

Only one article by Moritz et al. (2015) includes more than one personality perspectives (e.g., investor, entrepreneur, involved third parties such as platforms). In their qualitative study, they investigate how information asymmetries within the crowdfunding process can be reduced by communication (e.g., of soft factors) between the parties involved via the internet (Moritz et al., 2015a). Nevertheless, the authors of the analyzed articles also recognize the potential that arises from investigating other perspectives (Table 7). They argue that future research "should consider the role that [all actors (crowdfunders, fund seeker and platforms)] play in this new phenomenon" (Rodriguez-Ricardo et al., 2018, p. 178) and that it is important to "further analyze the relationship between lender characteristics and those of borrowers" (Moss et al., 2015, p. 47).

Including several perspectives is a promising task for future research. As the saying "Birds of a feather flock together" implies people that share specific characteristics get along better. In his paper on homogeneity, Marsden (1988) discovers that people that have strong social relations are more likely to share similar attributes. Transferring this idea to the crowdfunding context, Venturelli et al. (2020) investigated the effects of ethnic and gender similarities between investors and entrepreneurs and the positive impact on funding in equity-based crowdfunding. Oo et al. (2019) focus on the mediating effect of similarity (in-group favoritism) between entrepreneurs and investors in reward-based crowdfunding. Additionally, Burtch et al. (2014) found that crowdfunders prefer

culturally similar and geographically proximate fund-seekers. Lin and Viswanathan (2016) refer to this phenomenon as “home bias”. Similarly, Mollick (2014) suggests that geography may play an important role. These studies demonstrate the importance of investigating the relationship between funding seekers and investors in the crowd. Therefore, we strongly encourage research on the personality of all parties involved in the crowdfunding process and especially the interaction between investors’ and entrepreneurs’ personality. A concrete research question dealing with this change of perspective is: *Are there interactions between the personalities displayed by entrepreneurs and those of the contributing investors in the crowd?* Answering this question could impact how entrepreneurs approach investors in the crowd. It would also shed light on investors' selection processes when finding crowdfunding campaigns to invest in.

6.2 Implications

Our results have a number of implications for research and practice. First, our study implies that quantitative crowdfunding researchers should pay particular attention to the type of crowdfunding, the measure of success utilized and the selected personality traits when designing their studies. Second, the mixed results for many traits imply a strong need for replication studies to validate the results and methods used. Third, authors should consider qualitative and mixed methods approaches in future studies to advance and deepen our theoretical knowledge and not just test existing knowledge or theory. Fourth, personality researchers, our results imply that many of these constructs may not be fully distinctive from one another or optimally measured in crowdfunding by using narrative approaches alone. Therefore, it could be helpful to combine different types of analysis to better capture personality traits (e.g., the analysis of campaign text narratives

with the analysis of pitch videos, observer ratings or questionnaires). Finally, our results can feed into big data approaches and into studies on deception in crowdfunding and other forms of entrepreneurial finance (e.g., Siering, Koch, & Deokar, 2016; von Selasinsky & Isaak, 2020).

Our study also has several practical implications. First, for entrepreneurs seeking capital from the crowd, our results imply that displaying certain types of personality when crafting their campaign narratives (e.g., openness) in certain types of crowdfunding (e.g., reward-based) can indeed impact the success of their campaign (see Table 6). Entrepreneurs that display openness are presumably more likely to be perceived as having the necessary networking capabilities to succeed with a startup venture.

Second, by examining the results in comparison, investors in the crowd could screen campaigns for traits in which entrepreneurs display personality that improves (or reduces) the probability of a successful outcome, guiding their investment decision beyond just utilization of hard facts (e.g., the number of backers so far and the amount collected so far).

Third, crowdfunding platforms could add personality screening inventories when conducting their project due diligence when evaluating project risks (together with other existing factors such as screening for typos and completeness of the campaign text and multimedia) to better pick the winners and improve their preselection of which projects are allowed to enter the crowdfunding process.

6.3 Limitations

Our study also has a number of limitations. First, due to the specialized nature of the subject which requires interdisciplinary approaches, our review covers only a limited number of articles. Second, which factors should be considered as personality traits in a

narrower sense is not always clear. We included those which are mostly unquestioned in psychology (particularly the Big Five and the Dark Triad traits) and a number of additional traits that are frequently used in studies that appear in top entrepreneurship journals (e.g., ETP, JBV, etc.) in our literature review (Costa Jr & McCrae, 1995; Paulhus & Williams, 2002; Rauch & Frese, 2007). Nonetheless, this could be further extended by incorporating studies on what some psychologists now refer to as the sixth basic component of personality (the Honesty-Humility trait, yielding the Big Six, also known under the acronym HEXACO) (Ashton & Lee, 2007; Saucier, 2009). Third, researchers often refer to other psychological constructs while investigating entrepreneurial behavior. These include passion, which describes a strong inclination towards a specific activity (Murnieks, Mosakowski, & Cardon, 2014) and altruism, i.e., prosocial behavior (Batson & Powell, 2003). Although passion is more of an emotional (Anglin et al., 2018a; Avey, Wernsing, & Luthans, 2008) and altruism is more a motivational construct (Rushton, Chrisjohn, & Fekken, 1981) than a personality trait, further research could investigate both in the context of crowdfunding. While including these would have been out of the scope of this study, in an additional informal screening of such literature, we found very few such studies, highlighting a significant research gap regarding plurality of actor perspectives when examining crowdfunding and personality.

6.3 Conclusion

We conclude our literature review on personality research in crowdfunding by noting that this is a very young and budding research field, which still offers considerable room for further research. Our results question a finding of the article "How Should Crowdfunding Research Evolve" that reports no interest by leading editors surveyed in the research field of ‘personality theories’ in crowdfunding (McKenny, Allison, Ketchen,

Short, & Ireland, 2017). Recently, however, we observe an increase in published studies in this research field which indicates growing interest by the scientific community. Newly available analysis methods might be driving this trend. For example, scraping techniques have evolved to gather online data more easily; also, new software tools such as those based on artificial intelligence capitalize on big data approaches and permit the investigation of personality in novel ways.

By identifying crucial gaps in the literature for future research and by highlighting which approaches are needed for this research stream to evolve our review contributes to research on crowdfunding and personality (e.g., Anglin et al., 2018a; Moss et al., 2015) and to research on the entrepreneurial personality more generally (e.g., Kets de Vries, 1977; Rauch & Frese, 2014). First, future studies should examine non-linear relations between expressed personality traits and crowdfunding success, as personality traits are not dichotomous and can cause different behavior depending on the intensity of expression. Second, there is a need for studies that employ different methods such as mixed methods approaches to validate narrative analysis techniques with, for example questionnaires or experiments. Third, to obtain a clear picture of personality effects in crowdfunding, replication studies in similar and different contexts are of crucial importance to this scientific field. Fourth, our review revealed that a plurality of personality perspectives would strengthen future research. We hope that our review article will help to encourage research in this area and provide researchers with a first systematic overview of the field.

C. Essay 2: Success Lies in the Eye of the Beholder: Big Five Personality Signals and Negativity Bias in Equity Crowdfunding[4]

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C. Essay 2: Success Lies in the Eye of the Beholder: Big Five Personality Signals and Negativity Bias in Equity Crowdfunding

1. Abstract:

Expressed personality traits can play a pivotal role in shaping how entrepreneurs' narratives are perceived by investors. Using a sample of 709 campaigns collected from four leading US-based equity crowdfunding websites and enriched with corresponding pitch videos and SEC data, this study investigates the relationship between personality traits signaled by entrepreneurs to investors and subsequent funding success of equity crowdfunding campaigns. Of the Big Five personality traits, in particular, we find that higher conscientiousness, lower neuroticism, extraversion, and surprisingly lower openness seem to serve as signals of equity crowdfunding success, significantly affecting both the funding amount received and the number of investors attracted by campaigns. Moreover, we find that the information volume of a given campaign amplifies the negative effect of perceived neuroticism on funding success, suggesting a role for negativity bias. Partly challenging conventional wisdom, this study extends the literature on the relationship between personality and entrepreneurial finance by providing new input to a longstanding and central debate on the impact of individual-level components upon entrepreneurial outcomes in the underexplored alternative finance market and by demonstrating the context-dependent nature of personality signals within their respective investment contexts.

2. Introduction

For entrepreneurs acquiring early investors is a crucial determinant of the success or failure of a venture. Firms that receive venture capital have a survival rate of 60,3% compared to those that do not of only 21,1% (Puri & Zarutskie, 2012). Crowdfunding presents an alternative financing method, where firms acquire capital from a crowd of individuals in exchange for rewards, shares, or the right to vote via an open call

(Belleflamme et al., 2010). Equity crowdfunding is a particular form of crowdfunding where a firm sells equity(-like) shares to investors in the crowd, opening a new pathway for companies to raise seed capital from shareholders in a less regulated way than via initial public offerings (Cumming et al., 2019b). It differs from reward-based crowdfunding because the amounts raised are higher and investors are primarily interested in long-term positive returns rather than just in seeing an innovative project realized (Vismara, 2016; Vulkan, Åstebro, & Sierra, 2016).

Previous literature identifies a number of crowdfunding success factors, including attributes of the entrepreneur, media usage, distinctiveness, and the information provided in a given campaign, as well as third-party involvement (Anglin, Short, Ketchen, Allison, & McKenny, 2020; Taeuscher, Bouncken, & Pesch, 2021). Courtney et al. (2017), as well as Wang et al. (2019), find support for the positive effect of video and image inclusion on crowdfunding campaign success. Information offered on the campaign page is also vital: thus, roadmaps and project-related risk information provided impact campaign success (Ahlers et al., 2015). Further, Courtney et al. (2017) find that receiving venture capital backing or the affiliation with prominent organizations are startup quality signals for investors, and third-party endorsement can signal campaign creators' trustworthiness. Several other factors, such as campaign duration, Facebook shares, the location, the target amount, campaign updates, product innovativeness, perceived product creativity, and the chosen crowdfunding platform can also impact crowdfunding success (Bi et al., 2017; Block et al., 2018; Chan & Parhankangas, 2017; Courtney et al., 2017; Davis et al., 2017; Prodromos et al., 2014). While research has supported the notion that the manager's character is predictive of a company's outcome (Bertrand & Schoar, 2003; Harrison et al., 2020), very little is known about the impact of the Big Five personality traits in

crowdfunding. The Big Five model from psychology (McCrae & Costa, 1987) focuses on five key traits: openness (e.g., to new experiences), conscientiousness (e.g., dependable, self-disciplined), extraversion (e.g., outgoing. enthusiastic), agreeableness (e.g., sympathetic, warm), and neuroticism (i.e., emotional instability) (Gosling et al., 2003).

The combination of traits that form a person's distinctive character is referred to as *personality*[5]. Personality includes a broad range of aspects from abilities such as different forms of intelligence, motives, attitudes up to a person's characteristics and temper. Taken together, personality forms a key foundation for individual differences between humans (Mairnesse et al., 2007). Studies show that personality traits remain relatively stable over time (Costa & McCrae, 1988). In personality research, the lexical hypothesis posits that most socially relevant and salient personality characteristics have been encoded in our natural language. Therefore, the vocabulary contained within oral and written speech in daily interactions forms a basis for measuring such differences (Goldberg, 1981); examples of such speech include online communication to investors in equity crowdfunding.

Studies have shown that personality impacts corporate fundraising (Gruda et al., 2021), angel investor evaluations and syndication behavior (Block et al., 2019; Mitteness, Sudek, & Cardon, 2012; Murnieks, Sudek, & Wiltbank, 2015). In this study, we examine the role of personality in equity crowdfunding through the lens of signaling theory (Spence, 1978) and, specifically, the influence of the perceived personality of entrepreneurs on the success of their funding campaigns. Prior to a campaign, entrepreneurs craft individual campaign materials using internet-based crowdfunding

[5] https://www.lexico.com/en/definition/personality

platforms as transaction mediators (Ahlers et al., 2015) to share information with the crowd of potential investors.

Signaling theory (Spence, 1978) considers signals as a medium to reduce information gaps (i.e., asymmetries) between two parties, i.e., where one party knows more than the other and could exploit this information supremacy. In investor decision-making, signals can provide information about the riskiness of an underlying asset. Studies show a positive impact of signaling characteristics on the likelihood of raising capital via initial public offerings or crowdfunding (Baum & Silverman, 2004; Chan & Park, 2015; Loughran & McDonald, 2013). Psychologists Rozin and Royzman (2001) theorize that based on both innate predispositions and experience, people give greater weight to negative entities (e.g., personal traits like neuroticism, the only negative trait among the Big Five). Yet, given such negativity bias, it seems natural to further differentiate to treat negative (personality) signals in a more nuanced way. However, despite the growing body of research on the entrepreneurial personality (e.g., Miller, 2015), scholarly knowledge about crowdfunding signals remains limited (Short, Ketchen, McKenny, Allison, & Ireland, 2017) and only one published study to date investigates the Big Five personality traits on the heavily studied Kickstarter platform (Thies et al., 2016a). The authors find evidence for the positive impact of openness and agreeableness and a negative effect of neuroticism on rewards-based crowdfunding success (Thies et al., 2016a).

To our knowledge, no published study examines the Big Five model in the context of equity crowdfunding, let alone across platforms and using more than one type of operationalization. Yet, this research area is of particular interest because equity crowdfunding is much closer in nature to classical equity investment than other forms

(Cholakova & Clarysse, 2015): For instance, firms that seek equity crowdfunding seem to be less profitable and have higher debt (Walthoff-Borm, Schwienbacher, & Vanacker, 2018), raising the stakes of investor signals. In this paper, we seek to close this gap by examining the effect of the entrepreneur's personality (as perceived by investors in the crowd) on funding success in equity crowdfunding. Therefore, our research question is: which perceived personality signals of entrepreneur's impact equity crowdfunding success?

McKenny et al. (2017) encourage the use of interdisciplinary approaches towards crowdfunding that focus, for instance, on behavioral psychology and the examination of campaign language and rhetoric. Further research is needed for a more detailed understanding of verbal expressions of entrepreneurs and their effects (Clarke, Cornelissen, & Healey, 2019). We address our research question by means of content analysis of personality traits expressed in campaign page texts and video pitch subtitles of 709 U.S.-based equity crowdfunding campaigns and subsequent regression analysis. By examining the actual signals expressed in crowdfunding campaigns, we avoid the self-report and third-party rating biases inherent in many other studies.

Our study makes two key contributions to the existing literature. First, we contribute to the nascent literature stream investigating information mechanisms (e.g., narratives) to achieve crowdfunding success. By applying both the signaling theory of Spence (1978) and the Big Five personality theory of McCrae and Costa (1987), we bridge two disciplines to uncover that beyond previously known quality signals, (cheap) personality signals evaluated collectively seem to play a valuable role in reducing information asymmetries between entrepreneurs and investors in the crowd (e.g., Mollick and Nanda, 2015). To the best of our knowledge, this study is also the first to examine

the role of personality signals in equity crowdfunding, and hereby uses the largest and most comprehensive known dataset of US equity crowdfunding projects compiled so far.

Second, by illustrating the context-dependence of personality signals in the underexplored alternative finance market, this study advances the literature on the relationship between entrepreneurial success and personality, providing new input to a longstanding and central debate on the role of individual-level components in entrepreneurial outcomes (Zhao et al., 2010). We find that personality displays on behalf of entrepreneurs seem to impact their financing success in equity crowdfunding and attribute this difference to the higher stakes and barriers to entry involved in equity investments and to the presumably somewhat higher sophistication of equity crowdfunding investors than in previous or other forms of crowdfunding.

3. Literature and Hypotheses Development

3.1 Information Asymmetry and Signaling

In efficient markets, all participants have all the information available and asset prices reflect all available information (Fama, 1970). In contrast, information asymmetry refers to situations where some economic agents have more information than others (Akerlof, 1970). The more information available on a market, the more it approaches an ideal information landscape that matches investors with firms, reducing moral hazard (Jensen & Meckling, 1979), i.e., situations where one party exploits their superior knowledge of the risk of an asset or transaction at the expense of another.

One way of resolving information asymmetries is through signaling (Connelly, Certo, Ireland, & Reutzel, 2011; Spence, 1978). Signaling theory describes how informed inside signalers can share relevant information with uninformed outside receivers, who could not access this private information on their own and have information gaps (Block

et al., 2018; Connelly et al., 2011; Spence, 1978). To fulfill their purpose, signals must be salient for receivers. Spence (1978) postulates that signals should be costly, ensuring that they are not easily imitated by signalers who do not share the same characteristics. Further, Kirmani and Rao (2000) categorize signals into those with and without upfront costs to the firm. Signals that are low-cost and need not be honest (e.g., non-binding or non-verifiable) are referred to as cheap talk (Almazan, Banerji, & Motta, 2008; Farrell & Rabin, 1996). Signals can even be cost-free when there is no gain from misrepresenting one's condition to others (Smith, 1994). In the case of startups seeking financing, founders send signals about their firm's (partly unobservable) quality and their own suitability as an entrepreneur to potential investors or lenders (Chen, Yao, & Kotha, 2009; Courtney et al., 2017; Herzenstein, Sonenshein, & Dholakia, 2011).

Biswas and Biswas (2004) find that consumers perceive higher risks in online than in offline-settings and therefore argue convincingly that signals matter more on the world-wide-web. Equity crowdfunding presents a highly uncertain context for investor decisions. Investors in the crowd are usually less sophisticated than professional investors and often have scarce information to go on, so it is challenging for them to assess startup quality (an adverse selection problem). In the context of crowdfunding, entrepreneurs seeking funding are the senders who hold private information about their project and team and send signals to investors in the crowd via the project website and pitch video. These signals allow investors (the receivers) to base their decisions on a more comprehensive information base (Connelly et al., 2011) and can be complementary to each other and domain-specific (Bapna, 2019). The information asymmetry between entrepreneurs and investors increases the dependence on the (one-sided) signals provided by the entrepreneur. This asymmetry is even higher for equity crowdfunding than for traditional

reward-based crowdfunding, where backers do not receive a stake in the firm for their investment (Agrawal, Catalini, & Goldfarb, 2014).

Signaling has been of great interest to crowdfunding researchers. For instance, Anglin et al. (2018a) denote that research in Signaling theory focuses not only on costly signals like patents, etc., but also on signals associated with more indirect costs, which are of special interest in situations where objective signals within an investment context are missing and in the presence of additional uncertainty (Loewenstein, Sunstein, & Golman, 2014). Such situations include an unestablished investment context (like equity crowdfunding) and a less qualified or experienced audience (Ahlers et al., 2015; Cholakova & Clarysse, 2015).

Crowdfunding researchers have argued that signals do not need to have direct costs (Anglin et al., 2018a); we believe that displayed personality in equity crowdfunding meets the initial definition of a costly and observable signal as defined by Spence (1978), but at very least of such indirect costs. First, many articles show, that e.g., venture capitalists closely evaluate human capital aspects such as top management team characteristics when deciding whether or not to invest (Zacharakis & Meyer, 2000). Television shows like "Meet the Drapers" or "Shark Tank" also exemplify that investment decisions are based not only on business ideas but also on the people behind them. We assume that entrepreneurs seeking equity investments from the crowd are well aware of the importance of how they and their personalities are perceived. Therefore, we argue that entrepreneurs expend effort to achieve a preferred representation of themselves (time is money) and display it to the investors, since not doing so could result in unrealized gains. As our signal is not the entrepreneur's personality but the displayed (and thereby *perceived*) personality via text and video, there are (in-)direct costs linked to it (e.g.,

content creation, video production, etc.). Second, the displayed entrepreneurs' personality via video or text can also be seen as an observable signal. It is human to build an impression of other people based on "thin slices": This impression leads to rapid judgments based only on pictures, social media accounts, first glances, videos, etc. (Rule & Ambady, 2010; Turner & Hunt, 2014). Such impressions undoubtedly affect people's behavior towards third-parties (Rule & Ambady, 2010) and studies reveal that humans also attribute personality traits based on such thin slices (Thoresen, Vuong, & Atkinson, 2012). Therefore, the displayed personality of campaign creators as a signal in the crowdfunding context meets the requirement of observability and costliness as defined by Spence (1978) and are also in line with indirect (cheap) costs as shown by Smith (1994).

3.2 Negativity Bias

Given information overload, investors are forced to pay selective attention when evaluating assets in their portfolio and to use reference points as a type of cognitive short-cut. Whereas a positive event might be remembered, a negative one will definitely be (Rozin & Royzman, 2001). Rozin and Royzman (2001) find that based on both innate predispositions and experience, people give greater weight to negative entities (e.g., personal traits like neuroticism, the only negative trait among the Big Five), an effect known as *negativity bias*. Two manifestations suggested by the authors are particularly relevant to the context of this study: (a) negative potency (negative entities are stronger than their positive equivalents), and (b) negativity dominance (combinations of negative and positive entities yield evaluations that are more negative than the algebraic sum of individual subjective valences would predict) (Rozin and Royzman, 2001). This bias towards negativity seems to serve a critical evolutionary purpose (Vaish, Grossmann, &

Woodward, 2008). In the scientific literature, there are many examples that are rooted in this principle. Humans learn more from negative information than they do from positive ones (Vaish et al., 2008). Similarly, loss aversion (when people are more sensitive to losses than gains) has been shown experimentally to be a critical aspect in investor decision-making (Tversky & Kahneman, 1991). Further evidence on negativity bias has been found by Suh and Ugrin (2015), who show that positive information (disclosure about the board of directors quality) does not significantly influence investor judgments, whereas negative information (on financial risk exposure) does. In crowdfunding, the study by Moradi and Dass (2019) yields similar results: Whereas positive framing within the campaign text to investors (mentioning the gains of investing) shows no effect on the success of a crowdfunding campaign, negative framing (mentioning the costs of not investing) significantly impacts campaign outcomes.The context of equity crowdfunding presents a particularly high-risk scenario to investors, where in an already relatively anonymous online-intermediated setting, the stakes are also typically much higher than in other forms of crowdfunding (e.g., Ahlers et al., 2015; Biswas & Biswas, 2004). Therefore, we expect that negative personality traits signaled in equity crowdfunding would play a highly impactful role in investors' risk evaluations of entrepreneurs.

3.3 The Role of the Entrepreneur in Crowdfunding Success

A stream of literature focuses on the role of the entrepreneur as a success factor. For instance, authors find that continuous engagement and exchange with the crowd drive campaign success (Ahrens, Isaak, Istipliler, & Steininger, 2019; Nevin et al., 2017). The entrepreneur's education, professional experience, prior funding success, and gender can also influence crowdfunding success (Allison et al., 2017; Barbi & Mattioli, 2019; Courtney et al., 2017).

Within this stream, a unique discourse relates to the entrepreneur's personality and crowdfunding. Authors find both positive and negative relations between narcissistic rhetoric and crowdfunding success depending on the compliance with other characteristics of the entrepreneur (Anglin et al., 2018b). Contrary to this, entrepreneurs perceived as hubristic and charismatic as well as entrepreneurs displaying joy are more successful in raising funds (Jiang, Yin, & Liu, 2019; Sundermeier & Kummer, 2019). Moritz et al. (2015) argue that perceived sympathy, openness, and trustworthiness are essential in reducing information asymmetries in crowdfunding.

The entrepreneurship literature has focused on the Big Five personality models to describe an entrepreneurs' character and to explore links between personality and success. A meta-analysis by Zhao et al. (2010) finds a positive impact of openness and conscientiousness and a negative impact of agreeableness and neuroticism on entrepreneurial intentions and performance. Recently, the "Entrepreneurial Personality System" (Obschonka & Stuetzer, 2017) was developed based on the Big Five model, suggesting that entrepreneurs exhibit a personality profile that entails a combination of higher extraversion, openness, and conscientiousness bundled with lower values in agreeableness and neuroticism. The model quantifies this entrepreneurial personality structure by means of an individual's deviation from a statistical reference profile (Obschonka & Stuetzer, 2017). One extant study examines the influence of the Big Five personality traits on reward-based crowdfunding success (Thies et al., 2016a) and the authors find evidence for a positive impact of openness and agreeableness and a negative effect of neuroticism on funding success. Further, the qualitative study by Moritz et al. (2015) suggests a positive effect of openness in equity crowdfunding, though their concept of openness is not formally part of the Big Five.

3.4 Equity Crowdfunding

Title III of the JOBS Act legalized equity-crowdfunding for investors without accreditation in the U.S. (Ahlers et al., 2015). This mechanism opened a new way for firms to raise early-stage venture capital from shareholders in a less regulated way than via initial public offerings (Cumming et al., 2019b). While it is known that screening practices and characteristics used by investors in the crowd (Drover et al., 2017) significantly differ from those of angel investors (Macmillan, Siegel, & Narasimha, 1985; Mitteness et al., 2012) and venture capitalists (Sudek, 2006), a commonality is often passion for the resulting product (Cardon, Sudek, & Mitteness, 2009; Warnick, Murnieks, McMullen, & Brooks, 2018) and the importance of investor pitch communication (e.g., Chen et al., 2009; Loughran & McDonald, 2013). Unlike reward-based crowdfunding (Ahlers et al., 2015) equity crowdfunding gears towards early business expansion of existing startups or small firms that must register their offering with the S.E.C. and often includes real-estate projects, industrial applications with previously established brands, or pending patents and requires sizable investment amounts. Therefore, equity crowdfunding is closer in nature to classical venture capital and angel investment.

3.5 Big Five Personality Traits in Entrepreneurship and Hypotheses Building

An individual's personality forms the basis that affects an individual’s decisions and behavior in everyday life situations as well as in the economic aspects of life (McAdams & Pals, 2006; Rauch & Frese, 2014). It also affects people surrounding us, e.g., within our working environment (Lam, Lee, Taylor, & Zhao, 2018). The “Big Five” model of personality (Digman, 1990) consists of the traits openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (emotional stability), hence the acronym "OCEAN" (Costa Jr & McCrae, 1995).

Openness to experience is associated with the need for variety, creativity, and intellectual curiosity (Costa Jr & McCrae, 1995). People who express a highly open personality are socially skilled and thought to be good salespeople with greater-than-average management skills (Almlund et al., 2011; Costa Jr & McCrae, 1995). They also show a higher motivation to reach self-set goals (Judge & Ilies, 2002). People who rate low on openness are considered to be risk-averse and favor the status quo (Almlund et al., 2011). A meta-analysis conducted by Zhao et al. (2010) suggests a relation between high openness and entrepreneurial intentions and success. Further, Obschonka and Stuetzer (2017) integrate a high rating of openness in their "Entrepreneurial Personality System" and find significant results for the effect of openness on self-employment status in the U.S. The study by Thies et al. (2016) shows a positive effect of a high expression of openness on rewards-based crowdfunding success which is also suggested by Moritz et al. (2015). However, despite these initial positive results, Miller (2015) argues convincingly that personality attributes are Janus-faced and that the negative aspects of the entrepreneurial personality have been largely ignored so far. For instance, openness also relates to sensation-seeking and questioning authority (Costa Jr & McCrae, 1995). Researchers also find a strong tendency toward risk and relationships between openness and both egoistic bias and narcissism (Paulhus & Williams, 2002). Despite these potentially harmful influences that openness could have on funding success, the above literature leads us to argue that:

H1*: In equity crowdfunding, openness is positively related to funding success.*

Conscientiousness stands for achievement-orientation, hard work, organization, attention to details, dutifulness, and self-discipline; Conscientiousness is also a predictor

of in- and extrinsic career success as well as job performance and even wages (Almlund et al., 2011; Hogan & Ones, 1997; Judge et al., 1999). Researchers report a positive correlation between an entrepreneur's conscientiousness and long-term venture survival (Ciavarella et al., 2004). The meta-analysis conducted by Zhao et al. (2010) also shows a significant effect of entrepreneurs' conscientiousness and entrepreneurial intentions and outcomes. These results could stem from the sense of duty and involvement that conscientious people feel regarding projects in which they participate (Bozionelos, 2004). Based on the above, it can be concluded that conscientious personalities are preferred by investors when looking for qualified entrepreneurs or startup teams. It is therefore not surprising that the "Entrepreneurial Personality System" postulates high conscientiousness for self-employed people (Obschonka & Stuetzer, 2017). Thies et al. (2016) find inconclusive results about the effect of conscientiousness on crowdfunding success, but Bernardino and Santos (2016) find a positive effect. From the above, overall, we posit that:

H2*: In equity crowdfunding, conscientiousness is positively related to funding success.*

Extraverted people are sociable, optimistic, ambitious, dominant, and excitement-seeking (Bozionelos, 2004; Watson & Clark, 1997). Extroverted people tend to need a central position in their working environment to satisfy their strivings (Bozionelos, 2004). Despite this need, extroverted people are good at maintaining contacts, which leads to both high quantity and quality of social networks (Ciavarella et al., 2004). Even though these factors speak in favor of a positive influence of extraversion on the founding context, further empirical results vary. The meta-analysis by Zhao et al. (2010) finds no influence, whereas the study of Obschonka and Stuetzer (2017) finds a positive impact of

extraversion on success. However, Thies et al. (2016) find no influence of extraversion on the success of reward-based crowdfunding campaigns. Whereas some authors highlight the positive social aspects of extraversion, others refer to reward sensitivity, dominance, or impulsivity as critical elements that drive extroverted people (Revelle, 1997). Researchers showed, that high extraversion expressions of CEOs increase their firms stock risk (Harrison et al., 2020). Also, researchers have demonstrated a clear link between extraversion and overconfidence (Schaefer et al., 2004). Therefore it is not surprising that studies find significant correlations between extraversion and narcissism (Lee & Ashton, 2005; Paulhus & Williams, 2002). Contrary to the previous mixed results on the influence of extraversion on crowdfunding, researchers report consistently negative effects of narcissism on funding success (Bollaert et al., 2019; Butticé & Rovelli, 2020). Therefore, taken together, we argue that:

H3*: In equity crowdfunding, extraversion is negatively related to funding success.*

People with high scores on agreeableness tend to be seen as altruistic, friendly, flexible, courteous, forgiving, and modest and are generally described as trustworthy and warm (Almlund et al., 2011; Barrick et al., 2001; Bozionelos, 2004). While agreeableness implies willingness for cooperation and a need for harmony, this also creates a potentially risky dependency on others and studies actually demonstrate a negative relationship between high agreeableness and career success as well as work involvement (Bozionelos, 2004). Although scientists have found no relation between an entrepreneurs' agreeableness and long-term venture survival, this trait could still be helpful to receive the necessary social and financial support for a new venture (Ciavarella et al., 2004). Indeed, it has been found that perceived agreeableness can have a positive influence on

(reward-based) crowdfunding success (Thies et al., 2016a). Still, researchers so far find no clear effect of agreeableness on reward-based funding success (Bernardino & Santos, 2016) and entrepreneurial success (Zhao et al., 2010). Also, agreeableness is scientifically challenging since the trait is characterized by low salience; for instance, studies conducted using observer or peer ratings of personality find that agreeableness is harder to capture than other personality traits (Graziano & Eisenberg, 1997). Behavioral economists Ben-Ner and Halldorsson (2010) find that agreeableness explains investment-related trustworthiness. Such trust plays a crucial role in equity crowdfunding, where the stakes are much higher than in reward-based crowdfunding. Therefore, overall, we argue that:

H4*: In equity crowdfunding, agreeableness is positively related to funding success.*

Neuroticism (referred to as emotional stability when reverse-coded) is a trait related to the experience of negative emotions (Bozionelos, 2004). People with a high expression of this trait tend to worry and are described as pessimistic, irritable, insecure, and lacking social skills (Bozionelos, 2004). People with high neuroticism have a low locus of control – the degree to which people believe that they, as opposed to external forces, have influence over the outcome of events in their lives (Rotter, 1966) – as well as low self-esteem (Almlund et al., 2011). People with high scores in neuroticism are also less goal-oriented and unable to cope with uncertainty and change. Therefore, unsurprisingly, research has uncovered negative associations between neuroticism and job search efforts, work performance, performance motivation, and extrinsic success (Almlund et al., 2011; Judge & Ilies, 2002). Regarding entrepreneurship, scholars report a negative correlation between entrepreneurs' and small business managers' neuroticism and venture success (Obschonka & Stuetzer, 2017; Zhao et al., 2010). Further, low

trustworthiness seems to act as a deterrent to participation in crowdfunding (Gerber & Hui, 2013). Also, as managing performance pressure and coping with different expectations is a requirement for the success of entrepreneurs and entrepreneurial teams (Ciavarella et al., 2004), high expression of neuroticism is likely to have negative effects on crowdfunding (Thies et al., 2016a).

H5*: In equity crowdfunding, neuroticism is negatively related to funding success.*

Finally, Steigenberger and Wilhelm (2018) find that certain bundles of signals complement substantive signals by effectively directing the receiver's attention towards them. Specifically, the effect of substantive signals on crowdfunding performance can be strengthened when these are accompanied by rhetorical signals that increase the sender's credibility (Colombo, 2021; Steigenberger & Wilhelm, 2018). Yet, scientific studies on psychology and personality would argue that the opposite is also true, and likely even to a stronger degree: that rhetorical signals that negatively impact the sender's standing should be strengthened when in the company of other, more substantive signals. Following Rozin and Royzman (2001) people give greater weight to negative entities (e.g., personal traits like neuroticism), due to *negativity bias*. Therefore, we expect that neuroticism is harder for entrepreneurs to suppress and easier for investors to detect (more salient), *particularly* in the case of longer pitch videos or campaign text, leaving a stronger negative overall impression with more risk-averse equity crowdfunding investors (e.g., Ahlers et al., 2015; Biswas & Biswas, 2004). Also, we expect that more rhetoric shared by the campaign raises the likelihood of divulging negative personality signals and, therefore, their perceived strength. Therefore, we posit that:

H6a*: Video-duration amplifies the effect of neuroticism on funding success.*

***H6b**: Campaign text quantity amplifies the effect of neuroticism on funding success.*

4. Methodology

4.1 Context

Our study uses data provided on the homepages of four leading equity crowdfunding platforms in the U.S., StartEngine, Wefunder, Republic, and Netcapital. In the years 2017 to 2019, these platforms covered 60,87 % of the crowdfunding market in the U.S. in terms of form C filings under Regulation Crowdfunding (hereafter CF). All observed campaigns are regulation CF offerings (JOBS Act Title III, 2016), which means both non-accredited and accredited investors can invest in these campaigns. Our database includes campaigns from September 2016 up to March 2020. To our knowledge, this study utilizes the most comprehensive U.S. database on equity crowdfunding so far.

4.2 Data Collection and Analysis

To test our hypotheses, we first extracted a full sample of campaign descriptions, including comments, updates, and corresponding video pitch subtitles from the platforms. By utilizing language in general and the whole campaign text in particular, we follow methods employed by scientists on related topics (Anglin et al., 2018b; Butticé & Rovelli, 2020; Guo, Yu, & Gimeno, 2017; Thies et al., 2016a). In a next step, we ran the resulting text through the interface of IBM Personality Insights, which utilizes a dictionary-based coding scheme to predict the trait value of a given text. In essence, the habit of using certain categories of words when communicating correlates with a person's personality characteristics (see also, Fast & Funder, 2008; Pennebaker & King, 1999; Tausczik & Pennebaker, 2010). For English text, IBM's coding categories were pre-validated based on the known survey-based personality profiles and matching Twitter data of 1 million

users. Further, IBM reports a mean correlation of 0.31 and mean absolute error of 0.12 between the known traits of 2000 (IPIP) survey participants and the classification results via machine learning[6]. The same or similar processes have also been used in previous research on corporate fundraising (Gruda et al., 2021), blogging (Yarkoni, 2010). and, reward-based crowdfunding (Thies et al., 2016a)[7]. Next, we compiled supplementary financial data from regulation CF filings of the U.S. Security and Exchange Commission (S.E.C.) and the platform Crunchbase. This regulation limits the amount raised to a maximum of USD 1,070,000 within 12 months[8]. Of the initial 709 observations spanning four platforms (StartEngine, 273; Wefunder, 229; Repubic, 137; Netcapital, 70), we dropped five due to incomplete campaign information and six due to missing key values (e.g., the funding amount). We also checked for duplicates. Our outlier analysis led us to further exclude one campaign due to an exceptionally large amount of text, resulting in a final sample size of 697 campaigns. 529 campaigns included a video on the campaign page; hence, our models that incorporate video subtitle text have 529 observations.

We test our hypotheses with linear regression (Wooldridge, 2013), which facilitates the interpretation of our results vis-a-vis alternatives and provides us an actual r-square value for our models. Our dependent variable, the funding amount reached for a given campaign (Ahlers et al., 2015; Block et al., 2018; Chan & Parhankangas, 2017; Lukkarinen, Teich, Wallenius, & Wallenius, 2016) is non-normal according to a Shapiro-Wilk test ($p<.001$; $z = 12.032$) and is characterized by heteroskedastic errors according to a White test ($p<.001$; $\chi 2 = 257.03$); therefore, in line with previous literature, we use the

[6] The score for each trait is expressed as a percentage compared to this sample population. For example, if openness is 0.25 for a given campaign, it means that the entrepreneurs' campaign communication expresses more openness than 25% of the sample population and less openness than 75% (see Figure A.1, Appendix).
[7] https://cloud.ibm.com/docs/personality-insights?topic=personality-insights-science#precisePerLanguage
[8] https://www.sec.gov/smallbusiness/exemptofferings/regcrowdfunding

log-transformed variable (Block et al., 2018; Chan & Parhankangas, 2017; Lukkarinen et al., 2016) and report robust standard errors in our models. Also, variance inflation factors (VIFs) are below two for all our variables (M=1.24), suggesting that multicollinearity should not be an issue for our data. Further, we also plotted the residuals vs. the predicted values and did not find non-random patterns in the residuals. Since Hornuf and Schwienbacher (2015) demonstrate that portal design affects investment behavior of the crowd, we specify the funding platform as a fixed effect (McCaffrey, Lockwood, Mihaly, & Sass, 2012). To align the datasets from the four platforms as closely as possible, we harmonize the names of corresponding project categories; if the same category is not available on the second platform (e.g., health technology), we assign the project to the closest alternative category available.

4.3 Control Variables

Perceived project quality shapes investors' overall impression towards a crowdfunding campaign (Bi et al., 2017) and, therefore, influences the effect that other signals have on crowdfunding success (Mollick, 2014). For example, the use of videos increases the borrower's perceived creditworthiness, and endorsement by others (e.g., via comments) can help to validate given information (Courtney et al., 2017; Elliott, Hodge, & Sedor, 2012; Wang et al., 2019a). Research on this topic denotes the word count of the campaign description text, media use (e.g., pictures, videos), and the number of updates and comments as quality indicators (Bi et al., 2017; Courtney et al., 2017; Mollick, 2014; Wang et al., 2019a). Therefore, we include these variables as controls in our models. Based on previous literature (Barbi & Mattioli, 2019; Mollick, 2014), we also control for project size, category, security type, number of employees, company age (established

company), the year, campaign duration, location (state), and word count for project descriptions and videos. Table 8 below summarizes the key variables used in our study.

Table 8: Description of Variables

Variable	Definition	Source
Funding (ln)	Natural logarithm of the received funding amount	Ahlers et al., 2015
Investors (ln)	Natural logarithm of the number of investors contributed to the funding	Ahlers et al., 2015
Openness, conscientiousness, extraversion, agreeableness, neuroticism	Personality trait as percentile resulting from a reference population. Computed by IBM Personality insights using written text (HPT – Homepage text, VT – video subtext, VHPT – combination thereof)	Thies et al., 2016a
Word count	Length (in number of words) of the project description and updates presented on the campaign page (HPT), the video subtitles (VT), or the combination thereof (VHPT)	Bi et al., 2017
Picture count	Number of pictures included in the campaign page	Courtney et al., 2017
Updates (ln)	Natural logarithm of the number of updates posted on the campaign page	Block et al., 2018
Comments (ln)	Natural logarithm of the number of comments/number of questions posted on the campaign page	Courtney et al., 2017
Multiple visible speakers	Number of speakers visible in the campaign video	Sellen, 1992
Project category	Economic sector of the company (adjusted according to the StartEngine categories)	Bapna, 2019; Mollick, 2014
Project size	Categorical variable that = 1 if Goalmax<107000; = 2 if Goalmax>=107000 & Goalmax<712162; = 3 if Goalmax>=712162 & Goalmax<1070000; = 4 if Goalmax>=1070000 (regulation C allows a maximum of $1,070,000 raised)	Ahlers et al., 2015; Vismara, 2016
Security type	Categorical variable (common stock, debt, preferred stock, SAFE, other)	
Number of employees	Number of employees the company has indicated in the SEC filing	Ahlers et al., 2015
Established company	Companies active longer than 5 years	
Jurisdiction	Jurisdiction of the company launching the campaign is registered	Allison et al., 2015 (location)
Year	Year of the campaign launch (2016-2020)	
Campaign duration	Variable calculated with campaign deadline indicated in the SEC filing and the signature date of the document	Anglin et al., 2018a; Mollick, 2014
Platform	Categorical variable for the two crowdfunding platforms	[9]

[9] We also coded a number of additional control variables (e.g., founder/CEO speaks, gender, education/professional degree), but these were not significant and therefore not included. We also found that projects that significantly mention "patents" in their campaign receive more funding in bivariate regression with the funding amount but found no such effect in our full models.

5. Results

The campaigns in our dataset span four U.S.-based platforms, 62 jurisdictions, and 39 project categories (e.g., health technology, fashion, and apparel, etc.). Our sample covers a total a funding volume of USD 174,313,985 (*M*=248,310.52; *SD*=328040.7) contributed from 302,506 (*M*=430.92; *SD*=764.373) total investors. The combined campaign pages and video subtitles analyzed had an average length of *M*=6088.22 (*SD*=3595.204) words. Further descriptive statistics can be found in Table 21 in the appendix. The correlations between the different personality traits in our data are in line with previous research (e.g., van der Linden, te Nijenhuis, & Bakker, 2010) and are well below the threshold level of .7. The highest correlation in our dataset is between openness and neuroticism (.64)[10] (Table 22, Appendix). Next, we describe our regression results, based on Table 9. Models 1 and 2 show the effects of the control variables, while Models 3 and 4 show the main effect of the Big Five personality variables, and Models 5 and 6 show the combination thereof on funding success, respectively. Models 7 and 8 include the interactions of perceived neuroticism and video length, while Models 9 and 10 display the interaction between perceived neuroticism and word count. All models are based either on the combination of homepage text and video pitch subtitles (VHPT) or only on the video subtitles of a project (VT).

[10] If we log-transform our neuroticism indicator, this reduces the correlation with openness, but results remain similar. Therefore, we opted not to transform any of our Big Five5 constructs in the final model specification. Results can be provided on request.

Table 9: OLS Models of Big Five in Video & Homepage-Text w. Platform Fixed Effects

DV: Funding Amount (ln)	(1) VHPT	(2) VT	(3) VHPT	(4) VT	(5) VHPT	(6) VT	(7) VHPT	(8) VT	(9) VHPT	(10) VT
Comments (ln)	.662**	.659**			.637**	.647**	.63**	.65**	.631**	.646**
	(.038)	(.045)			(.038)	(.045)	(.038)	(.045)	(.038)	(.045)
Updates (ln)	.052	.087*			.051	.088*	.056	.089*	.047	.092*
	(.038)	(.042)			(.038)	(.042)	(.038)	(.042)	(.038)	(.042)
# of Images	.003†	.005**			.003†	.005**	.003*	.005**	.003*	.005**
	(.001)	(.002)			(.001)	(.002)	(.001)	(.002)	(.001)	(.002)
Multiple Speakers	.129†	.088			.174*	.111	.198**	.131†	.178*	.133†
	(.072)	(.075)			(.071)	(.074)	(.071)	(.074)	(.071)	(.074)
Video Length	.001	.001			.001	.001	.001**	.002*	.001	.001
	(.001)	(.001)			(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Project Size	.155**	.14**			.153**	.134**	.152**	.129**	.157**	.13**
	(.035)	(.04)			(.034)	(.039)	(.033)	(.039)	(.034)	(.039)
Category	.001	.001			.001	.001	.001	.001	.001	.001
	(.003)	(.003)			(.003)	(.003)	(.003)	(.003)	(.003)	(.003)
Security Type	-.014	-.031			-.019	-.033	-.028	-.044	-.027	-.043
	(.041)	(.046)			(.04)	(.046)	(.04)	(.045)	(.04)	(.045)
# of Employees	.008**	.008**			.008**	.009**	.008**	.009**	.008**	.009**
	(.003)	(.003)			(.003)	(.003)	(.003)	(.003)	(.003)	(.003)
Jurisdiction	-.003	-.002			-.003	-.003	-.003	-.003	-.003	-.003
	(.003)	(.003)			(.003)	(.003)	(.003)	(.003)	(.003)	(.003)
Established Comp.	.17*	.152†			.192*	.152†	.184*	.149†	.182*	.147†
	(.083)	(.09)			(.081)	(.089)	(.08)	(.088)	(.082)	(.089)
Campaign Duration	.001	.001			.001	.001	.001	.001	.001	.001
	(.001)	(.001)			(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Word Count	.001**	.001			.001**	.001	.001*	.001	.001**	.001
	(.001)	(.001)			(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Openness			-1.51**	.374	-1.035**	.05	-.682†	.031	-.87*	.036
			(.511)	(.382)	(.381)	(.276)	(.39)	(.277)	(.392)	(.277)
Conscientiousness			2.073**	.008	.699*	.145	.681*	.138	.674*	.124
			(.458)	(.256)	(.339)	(.188)	(.339)	(.187)	(.337)	(.187)
Extraversion			-1.227**	-.49*	-.638**	-.383*	-.648**	-.419**	-.667**	-.419**
			(.293)	(.21)	(.239)	(.155)	(.239)	(.156)	(.237)	(.155)
Agreeableness			.483	-.361	.196	-.28†	.193	-.272	.198	-.283†
			(.603)	(.259)	(.406)	(.167)	(.396)	(.166)	(.4)	(.166)
Neuroticism			-.044	-.657**	-.537†	-.319†	.031	.097	.116	.25
			(.355)	(.226)	(.3)	(.175)	(.37)	(.276)	(.498)	(.295)
Neurot.#VideoLen.							-.006**	-.003*		
							(.002)	(.001)		
Neurot.#WordCount									-.001†	-.002**
									(.001)	(.001)
Year dummies incl.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Platform Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	697	529	697	529	697	529	697	529	697	529
R-squared	.614	.616	.22	.166	.628	.625	.634	.628	.631	.629
F-stat.	42.652**	36.883**	11.059**	3.36**	36.866**	30.033**	36.197**	29.518**	35.799**	29.142**
RMSE	.819	.803	1.154	1.17	.807	.797	.802	.795	.805	.794

*Robust standard errors are in parentheses; constant included but not shown, ** p<.01, * p<.05, †p<.1*

We interpret the results for Hypotheses 1-5 based on Model 5, which explains 62,8 percent in the variation in funding success (R^2=.628) and shows the controls and the main effect of personality of a given equity crowdfunding project on our dependent variable (log. of the funding amount). First, we find that the coefficient of openness is negative and significant (β=-1.035, p=.007), contrary to our prediction in H1. Second, we find that conscientiousness has a significantly positive effect (β=.699, p=.039), as predicted in our H2. Third, in line with our prediction (H3), we find a significant negative effect of extraversion on funding (β=-.638, p=.008); therefore, we cannot reject our H3. Fourth, we find that agreeableness has a positive but insignificant effect (β=.196, p=.630), leading us to reject our H4. Fifth, we a weakly significant effect of neuroticism on our dependent variable (β=-.537, p=.074), as predicted in H5.

Finally, in line with our predictions in H6a and H6b, we find a significant interaction between neuroticism and video-duration (Model 7, β=-.006, p=.009) and a weakly significant interaction between neuroticism and word count (Model 9, β=-.001, p=.065). As predicted by hypothesis H6a, results show that the negative association between the funding success of a crowdfunding campaign and *perceived neuroticism* becomes stronger, the longer the pitch video provided by the campaign. The coefficient of the interaction term is negative and significant (p<.001, Models 7 and 8). Similarly, this holds for our alternate measure of information volume provided by the campaign, the quantity of campaign text, though this second interaction is less significant when examining both homepage and the subtitled pitch videos (p<.1 in Model 9 vs. p<.001 in Model 10).

To better understand this effect, in Figure. 6a and Figure 6b, we illustrate the predictive margins for these interactions with 95% confidence intervals. We see that the

effects of perceived neuroticism on funding success differ by the length of the pitch video of a given campaign (Figure 6a) and by the quantity of campaign text (Figure 6b) when held at the mean and at one standard deviation above and below the mean, respectively.

Figure 6: Interactions between Perceived Neuroticism, Video Duration & Text Quantity

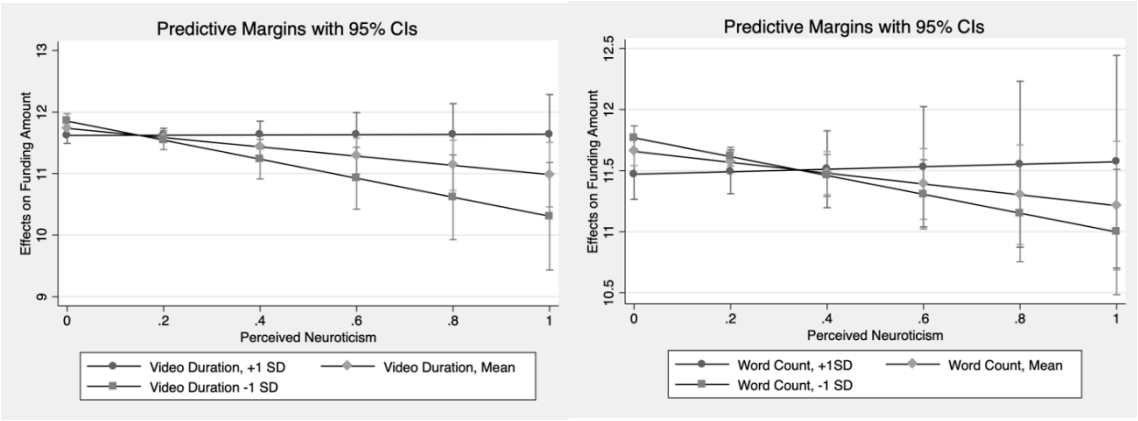

Figure 6a **Figure 6b**

Among our control variables, we find that campaign quality plays a role: there are significant positive effects of both text quantity (β<.001, p=.010) and comment quantity (β=.637, p<.001), as well as weakly significant results for the number of pictures (β=.003, p=.051). In addition, project size is positively significant (β=.153, p<.001), as are multiple visible speakers (β=.174, p=.014) and the number of employees (β=.008, p=.006). Our proxy for an established company behind the campaign (older than 5 years) is also significant (β=.192, p=.018). Further, we include the crowdfunding platform as a fixed effect in our models but also test this separately and find that the chosen crowdfunding platform has a significant effect on funding success (β=0.248, p<.001). We find no significant effects for the number of updates, video duration, project category, security type, campaign duration, location, or the year of the campaign.

5.1 Robustness Tests

Next, in order to check for the robustness of our results, we ran a number of alternative specifications. First, in line with previous authors (e.g., Chan & Parhankangas, 2017), we tried alternative dependent variables as a success measure, including the number of campaign investors and the ratio "funding amount per investor" with similar results.6

Second, we conducted a sensitivity analysis, in which we dropped all campaigns that fall within the 25% quartile in terms of the lowest word count in their campaign text and pitch video (effectively less than 3853 words); using this subsample, our results for personality remain stable and even improve slightly.1112 Third, we tried an alternative content analysis-based measure for the Big Five traits based on the software tool Receptiviti.[13] This is based on the software Linguistic Analysis and Word Count that employs count-based measures (e.g. the occurrence frequency of a given word type or category in a text). All five IBM personality variables show significant bivariate correlations with those of Receptivity (strongest for neuroticism r=.343, p<.001).

Finally, to enrich our data and provide a further robustness check for our operationalization, we conducted a further study. For this, we randomly chose 100 pitch videos from StartEngine, and Wefunder and employed a video-metric approach with naïve observer ratings to generate Big Five trait variables via the TIPI-G questionnaire. The advantages of this approach are that zero-acquaintance raters have a "clearer lens" when rating others (Connelly & Hülsheger, 2012) and are not influenced by biases such

[11] Results for investors as the DV and of the sensitivity analysis are omitted for brevity but are available upon request.
[12] As a further robustness check, to control for multiple campaigns launched by the same firm, we also conducted a panel analysis with random effects with similar results to Model 5, except that extraversion is no longer significant (p=.195).
[13] Results are available on request and go in the same direction for all the Big Five measures except conscientiousness openness and extraversion are significant using this measure with p=.001 and p=.0046, respectively. (website: receptivit.ai).

as social desirability (Petrenko, Aime, Ridge, & Hill, 2016) or impression management (Oh, Wang, & Mount, 2011). We integrated our videos into the questionnaire using the software platform Unipark, which allows us to adhere to the EU data protection guidelines (GDPR). The questionnaire consists of participant demographics and the TIPI-G personality questionnaire.[14] Two hundred thirty-five participants rated five videos each, leaving us with a panel of 1175 observations. We employed OLS regression, retaining the same control variables used above. From the survey, we find that the coefficients for four of the Big Five variables remain in the same direction (conscientiousness: β=.033, p=.077 †, extraversion: β=-.007, p=.696, agreeableness: β=.019, p=.331, neuroticism: β=-.044, p=.026*) except for openness, which is positively significant (β = .039, p=.03*) as hypothesized in our H1. This difference could be explained by less information available to survey participants, who rated the video but did not regard the homepage text. Another explanation could be that humans are (currently) better able to rate personality than AI-based algorithms.

6. Discussion

To interpret our findings on the influence of the Big Five Personality traits on equity crowdfunding success in the light of signaling theory, we primarily focus on Model 5 (Table 9, full model). First, our finding that openness negatively impacts funding success is somewhat surprising and contrary to our H1. While openness has been related to creativity (Costa Jr & McCrae, 1995) upon careful reflection, it may be that for equity crowdfunding (in contrast to rewards-based crowdfunding), where firms are comparatively established, business *execution* is crucial, which is reflected in the

[14] Participants also rated attractiveness, trustworthiness, and competence of the depicted people, video quality and stated their investment probability into the given project.

campaign descriptions that generally seem more mature and product-focused. Also, openness has been related to risk-seeking behavior (Almlund et al., 2011). Further, Ciavarella et al. (2004) note that high openness, may not result in the commitment needed to manage a company during crises and report a negative effect of high openness on long-term venture survival. Similarly, Murnieks et al. (2015) argue that lower openness scores lead to higher management team evaluations by angel investors, who remain focused on implementing a business plan rather than on constantly exploring new opportunities. Startups acquire capital via equity-based crowdfunding at a more advanced stage than from reward-based crowdfunding. Therefore, it seems likely that the positive influence of openness, which Thies et al. (2016) find, decreases with a company's development away from the ideation stage toward a solid business model. For later-stage startups, investors, therefore, increasingly reward low openness with higher funding. Our results on openness indicate a closer relationship between classical forms of venture capital (e.g., angel financing) and equity crowdfunding than for reward-based crowdfunding. This implies that previous results on success drivers in crowdfunding (Lukkarinen et al., 2016) should be revisited from a novel perspective.

Second, we find a significantly positive effect of conscientiousness on funding success in line with our H2. This finding is also in line with respective studies in the general entrepreneurship context (Obschonka & Stuetzer, 2017; Zhao et al., 2010). Conscientiousness implies discipline and dependability, clearly a helpful trait for the survival of startup teams (Zhao et al., 2010) that also helps investor confidence in the crowd. This is especially interesting in light of the arguments that equity-crowdfunding is more similar to the classic venture capital context than to reward-based crowdfunding (Cholakova & Clarysse, 2015).

Third, our negative result for extraversion is in line with our hypothesis (H3). Our results on extraversion seem consistent with literature on the dark side of personality and the connection between extraversion, narcissism, and impulsivity (Creek et al., 2019; Lee & Ashton, 2005; Miller, 2015; Revelle, 1997). Such characteristics could be warning flags for investors who seek to avoid losing their investment and are interested in a strong bottom-line and certain returns. While extraverts tend to be assertive and dominant (Watson & Clark, 1997), which could help with sales of new products or services, this could also lead to conflict with employees and other stakeholders. Another potential explanation for the uncovered negative effect of extraversion in our study could be that extraverts are more likely to use self-promoting tactics, e.g., in interviews (Kristof-Brown et al., 2002) and that investors in the crowd may see through and distrust such tactics.

Fourth, while agreeableness has been related to trustworthiness, our non-result for the effect of agreeableness on equity crowdfunding success (our H4) is in line with studies on startup success that find negative or no effects of agreeableness for entrepreneurial performance (Zhao et al., 2010). Therefore, investors in the context of equity crowdfunding seem to place only marginal value on this trait in pitch videos and project descriptions of entrepreneurs. Finally, agreeableness is often a low-salience trait when using procedures other than self-report (Graziano & Eisenberg, 1997) and it is therefore likely to be harder to measure.

Fifth, our significantly negative finding for neuroticism is in line with our prediction in H5 and with previous work (e.g., Thies et al., 2016a). Neuroticism is associated with excessive worry and occupational failure (Zhao et al., 2010), and negativity bias regarding perceived personality (e.g. Rozin & Royzman, 2001) implies that investors are particularly likely to pay attention to this trait when evaluating

entrepreneurs and their projects for investment. Therefore, such signals by entrepreneurs seem to present natural red flags for risk-averse equity crowdfunding investors, where relatively high investments are common, and the stakes are higher than in other forms of crowdfunding.

Sixth, our models show that the campaign's information volume moderates the effect of perceived neuroticism on the funding outcome of campaigns as predicted in our H6a and H6b, respectively. In other words, such negative personality signals seem to be amplified by increased length of the pitch video or corresponding campaign text. This finding implies a complex nature underlying how neuroticism signals are perceived by investors and lends support to our argument that longer videos and campaign texts make it harder for entrepreneurs to conceal the extent of negatively perceived neuroticism signals (Gill, 2003; Gill & Oberlander, 2003). This finding is in line with that of Jiang et al. (2019), who demonstrate that for non-verbal (facial) cues, not only do emotions in startup pitches play a role in crowdfunding success but that the strength and duration of these signals are crucial. In addition, in line with negativity bias, it demonstrates that investors in equity crowdfunding campaigns are highly sensitive towards negative (personality) signals that could compromise their investment outcome. Further, the results for our control variables are largely in line with previous findings that show a positive relationship between campaign quality indicators (e.g., text and image quantity, video-duration, the number of employees, and our proxy for project size) and crowdfunding success (e.g., Bi et al., 2017; Mollick, 2014).

Finally, it is noteworthy that analyzing the text of both the project descriptions *and* the subtitled pitch videos increases the variation in funding success explained by our models (e.g., the R-squared value rises in the "VHPT" models versus those that include

only video subtitle text– labeled as "VT"). This secondary finding replicates recent empirical findings that the text of the campaign description and subtitled video narratives together and hence more information value better predict campaign success for reward-based crowdfunding campaigns in the U.S. technology sector (von Selasinsky & Isaak, 2020).

Our study also has several limitations. First, our sample is currently limited to U.S.-based equity crowdfunding platforms. Second, we do not measure the personality of entrepreneurs directly, but rather using constructs that result from linguistic algorithms based on narratives (see also, Fast & Funder, 2008). Hence, we aim to capture *perceived* personality traits as investor signals.[15] Further, our chosen method is also advantageous in that it facilitates big data and artificial intelligence approaches and avoids bias that can result from human coding or self-report measures of personality. Third, the previously mentioned intercorrelation of the Big Five personality traits is a known research challenge (van der Linden et al., 2010). In particular, the intercorrelation between neuroticism and openness uncovered in our sample is similar to findings reported by other authors (e.g., Thies et al., 2016a).

Further research can build on our work by comparing our findings to those from comparable equity crowdfunding platforms in other countries. Given our data, results should be most comparable in English-speaking realms, e.g., Australia, New Zealand, Singapore, and the United Kingdom. Nonetheless, a cross-cultural comparison could be interesting. Also, while our operationalization of the Big Five constructs is based on linguistic analysis of (public) text and therefore has the advantages of accessibility and

[15] IBM postulates that 3000 words are needed to reach the maximum accuracy of their algorithm. With a mean of 6088 words for our combined video and homepage text, 85,37% of our sample lies within this range. The remaining projects still have a highly reasonable average word count of 2286 words, so we expect little impact on categorization accuracy.

replicability, other authors could consider comparing alternate operationalizations of these personality traits with our results. In addition, the effect of personality on crowdfunding outcomes could be investigated in a team setting, where the distribution of personality expressions within a team can affect outcomes differently (Grijalva, Maynes, Badura, & Whiting, 2020). Finally, it seems likely that negativity bias should play a role not only in the case of the negatively associated Big Five trait neuroticism, but also in the case of other, second order, negatively perceived personality constructs such as narcissism (see Table 8).

7. Implications

We investigate our research question through the lens of signaling theory. This allows us to adapt the concept of personality to the new context of equity crowdfunding and to make several contributions to the literature. First, by examining the effects of the Big Five personality traits in the context of the U.S.-based equity crowdfunding market, our findings contribute to research on signaling in crowdfunding in entrepreneurship and information systems (Ahlers et al., 2015; Ahrens et al., 2019; von Selasinsky & Isaak, 2020) and relate to research on which personality traits are helpful for entrepreneurial teams in obtaining classical venture capital (e.g., Mitteness et al., 2012; Murnieks et al., 2015). In so doing, we broaden the field of application and show that perceived personality signals are context-dependent and can have very different effects on funding success depending on the type of crowdfunding observed.

Second, this study extends the broader literature stream on the relationship between entrepreneurial success and personality, providing new input to a longstanding and central debate on the impact of individual-level components on entrepreneurial outcomes (e.g., Zhao et al., 2010) in the underexplored alternative finance market.

Furthermore, we show that in equity-based crowdfunding, personality signals favored by investors in the crowd show fewer similarities to reward-based crowdfunding (Thies et al., 2016a) than to evaluations by angel investors (Murnieks et al., 2015). This result can help us to better understand the investors that contribute to equity-based crowdfunding campaigns.

Our study also has practical implications. First, our results can help equity crowdfunding investors and coaches better differentiate which personality traits signaled in pitch videos and project descriptions are predictive of funding success: The results imply that in order to succeed in equity crowdfunding, it is equally –if not more– important for entrepreneurs to avoid signaling negative attributes than to signal positive personality traits in campaigns. Second, startups that plan to raise capital via equity crowdfunding could increase their self-awareness regarding the personality signals communicated and thereby optimize their message to the crowd. Finally, for equity crowdfunding platforms, our results can feed into improved risk management of startup portfolios (e.g., as screening criteria).

D. Essay 3: When Personality Pays: Observer Rating of Personality and Financial Success of Equity Crowdfunded Startups[16]

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1. Abstract:

This study investigates the value of third-party ratings of personality in investor pitches for predicting the investment intention and successful equity crowdfunding of U.S.-based startups. Based on 1175 ratings of 100 randomly selected investor pitch videos, we find that not only do investors' impressions of entrepreneurs Big Five personality traits predict investment intention but that several of these also predict entrepreneurs' actual crowdfunding success (particularly: openness, conscientiousness and extraversion). The study contributes to our knowledge of the links between (perceived) individual-level traits of the entrepreneur and their ability to finance a venture, a key challenge in the early stages of startups.

2. Introduction

A key challenge faced by entrepreneurs is financing the venture. Bank loans may be harder to acquire in the current environment of uncertainty regarding interest rates, global supply chain interruptions, and economic slowdowns. For these reasons and others, alternative sources of venture finance are growing quickly in popularity and adoption. With the JOBS Act in 2012 (extended in 2016), equity crowdfunding emerged as an extension to other forms of crowdfunding and an attractive option to raise equity capital within the alternative finance market. In equity crowdfunding, investors in the crowd receive a stake of the firm in exchange for their investment, and minimum investment amounts typically start at 1,000 USD, allowing for total target funding amounts in the millions.

Only recently have authors begun to explore the role of perceived personality characteristics of the entrepreneur in crowdfunding (e.g., Bernardino & Santos, 2016;

Isaak, Neuhaus, & Bostandzic, 2021; Thies et al., 2016a). While several studies examine the influence of entrepreneurs on crowdfunding success, the link between survey-based approaches and those employing actual investment data remains largely unexplored. Either studies look at information and variables derived from crowdfunding pages or databases (e.g., CrunchBase), or researchers base their work on surveys and experiments conducted with potential crowdfunding investors. The number of studies examining the transferability of such results (e.g., investment intention to actual investment) remains limited. In particular, concerning founder personality, a success factor considered in various studies, no existing research focuses on whether results derived in a questionnaire-based setting (regarding investment intention, e.g., Kim & Hall, 2021) allow conclusions concerning actual investments. Our study addresses precisely this gap in the literature and investigates whether the perceived personality of founders influences the investment intention (surveyed via questionnaire) and whether similar effects can also be observed in the actual crowdfunding context. We, therefore, answer the following questions: (1) which personality cues perceived by third-party raters, impact their investment intention (surveyed) and (2) whether personality traits perceived by the third-party raters also correlate with crowdfunding success (realized capital on crowdfunding platforms)?

In doing so, we expand the literature on founder personality as an investment success factor and the transferability and generalizability of survey results with third-party raters to the context of actual crowdfunding campaigns and related investor behavior.

Through the lens of information asymmetry and Signaling theory (Spence, 1978), we answer this question based on over 1000 external observer ratings of U.S.-based

investor pitch videos and find that a number of these perceived personality cues are indeed predictive not only of investment intention but of actual funding success of the corresponding equity crowdfunding campaigns. Our study makes three contributions to the literature and practice: first, it contributes to our knowledge of the conditions under which personality cues based on pitch narratives are predictive of equity crowdfunding campaign outcomes. Second, by showing that the direction of these effects remains for both dependent variables (investment intention and funding success), we make a methodological contribution to this stream by showing that perceived personality cues based on survey-based investment intentions are a valuable proxy for actual investment volume (i.e., funding success). Finally, by showing the importance of personality signals for the investment intention (and actual equity funding success) of not only people with investment experience but also those without, we emphasize the importance of these signals for equity crowdfunding, a form of alternative financing that, by its widespread accessibility directly addresses the general population (a.k.a. the crowd).

3. Literature and Hypothesis Development

3.1 Information Asymmetry and Signaling

In efficient markets, all participants have all the information available, and asset prices reflect all available information (Fama, 1970). In contrast, information asymmetry refers to situations where some economic agents have more information than others (Akerlof, 1970). Decisions are affected by the information available, whether public or private (Connelly et al., 2011). The more information available on the market, the more it approaches an ideal information landscape that matches investors with firms, reducing moral hazard (Jensen & Meckling, 1979), i.e., situations where one party exploits their superior knowledge of the risk of an asset or transaction at the expense of another.

One way of resolving information asymmetries is through signaling (Connelly et al., 2011; Spence, 1978). Signaling theory describes how informed inside signalers can share relevant information with uninformed outside receivers, who could not access this private information on their own and have information gaps (Block et al., 2018; Connelly et al., 2011; Spence, 1978). To fulfill their purpose, signals must be salient for receivers. In the case of startups seeking financing, founders send signals about their firm's (partly unobservable) quality and their own suitability as an entrepreneur to potential investors or lenders (Chen et al., 2009; Courtney et al., 2017; Herzenstein et al., 2011).

Biswas and Biswas (2004) find that consumers perceive higher risks in online than in offline settings and therefore argue convincingly that signals matter more on the world-wide-web. Equity crowdfunding presents a highly uncertain context for investor decisions (Ahlers et al., 2015). Investors in the crowd are usually less sophisticated than professional investors and often have scarce information to go on, so it is challenging for them to assess startup quality (an adverse selection problem). In the context of crowdfunding, entrepreneurs seeking funding are the senders who hold private information about their project and team and send signals to investors in the crowd via the project website and pitch video. These signals allow investors (the receivers) to base their decisions on a more comprehensive information base (Connelly et al., 2011) and can be complementary to each other and domain-specific (Bapna, 2019). The information asymmetry between entrepreneurs and investors increases the dependence on the (one-sided) signals provided by the entrepreneur (Agrawal et al., 2014).

Signaling has been of great interest to crowdfunding researchers. For instance, in his literature review Colombo (2020) describes a variety of signals helping to overcome asymmetries within the investment context. Further, Anglin et al. (2018a) denote that

research in signaling theory focuses not only on costly signals like patents, etc., but also on signals associated with more indirect costs, which are of special interest in situations where objective signals within an investment context are missing and in the presence of additional uncertainty (Loewenstein et al., 2014). Such situations include an unestablished investment context (like equity crowdfunding) and a less qualified or experienced audience (Ahlers et al., 2015; Cholakova & Clarysse, 2015). Personality is an example of a signal that can play a role in situations where the support of others is required.

3.2 Crowdfunding Success Factors

Previous literature identifies a number of crowdfunding success factors, including attributes of the entrepreneur, media usage and the information provided in a given campaign, as well as third-party involvement (Anglin et al., 2020; Davis et al., 2017; Mollick, 2014; Wang, Li, Kang, & Zheng, 2019b). Further, Mollick (2014) demonstrates that crowdfunding entrepreneurs' use of videos and frequent updates are associated with higher success rates. The information offered on the campaign page is also vital: thus, project-related risk information provided by the crowdfunding entrepreneur positively impacts campaign success (Ahlers et al., 2015). Several other factors, such as campaign duration (negative), the location, the target amount (negative), campaign updates (positive), product innovativeness (positive), perceived product creativity (positive), and the chosen crowdfunding platform, can also impact crowdfunding success (Alkire et al., 2020; Block et al., 2018; Chan & Parhankangas, 2017; Courtney et al., 2017; Davis et al., 2017; Le Pendeven & Schwienbacher, 2023; Prodromos et al., 2014).

3.3 Investment Intention in Crowdfunding Literature

While most empirical studies on crowdfunding study the funding amount achieved as the dependent variable, a substream of crowdfunding research examines funding intention. To our knowledge, only a single study examines investment intent in equity crowdfunding: from a trust perspective, Kang et al. (2016) find that project-related, platform-related, and fundraiser-related information all three enhance trust in a fundraiser leading to his/her willingness to invest.

In the context of reward-based crowdfunding, Strohmaier et al. (2019) find that the institutional mechanisms of a platform (platform rules, monitoring, and security) affect the perceived trustworthiness of fundraisers. Also, in the setting of reward-based crowdfunding, Greenberg and Mollick (2017) find that female investors tend to support female fundraisers in industries where women are underrepresented and explain this from an identity perspective. Also focusing on gender, using a quasi-experimental survey design, Johnson et al. (2018) find that female fundraisers are more likely to succeed in reward-based crowdfunding because they are more trustworthy than men.

Finally, three studies investigate financing intentions in the context of donation-based crowdfunding. Liu et al. (2018) find a positive relationship between trust in the project and donation intention, while Simon et al. (2019) find an insignificant effect of trust on donation intention but that the strength of network ties with referrals has a positive effect, while obligation has a mediating effect. The third (survey-based) study by Wang et al. (2019) adds to this picture by finding that communication and social networks enhance the social identity of backers, thereby increasing their funding intention.

3.4 The Entrepreneur and Crowdfunding Success

An alternate stream of literature focuses on the role of the entrepreneur as a success factor. For instance, engaging with the crowd, along with factors like education, experience, and gender, play a pivotal role (Ahrens et al., 2019; Allison et al., 2017; Barbi & Mattioli, 2019; Courtney et al., 2017; Nevin et al., 2017; Piva & Rossi-Lamastra, 2018).

Within this stream, a unique discourse relates to the entrepreneur's personality and crowdfunding. Authors find both positive and negative relations between narcissistic rhetoric and crowdfunding success depending on the compliance with other characteristics of the entrepreneur (Anglin et al., 2018b). Contrary to this, entrepreneurs perceived as hubristic and charismatic are more successful in raising funds (Sundermeier & Kummer, 2019). Moritz et al. (2015) argue that perceived sympathy, openness, and trustworthiness are essential in reducing information asymmetries in crowdfunding.

The entrepreneurship literature has focused on the Big Five personality models to describe an entrepreneur's character and explore links between personality and success. An individual's personality forms the basis that affects a person's decisions and behavior in everyday life situations as well as in the economic aspects of life (McAdams & Pals, 2006; Rauch & Frese, 2014). Personality includes a broad range of aspects from abilities such as different forms of intelligence, motives, attitudes up to a person’s characteristics and temper. Studies suggest that personality stays stable over adolescent life (Costa & McCrae, 1988). The “Big Five” model of personality (Digman 1990) consists of the traits Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (emotional stability), hence the acronym "OCEAN" (Costa Jr & McCrae, 1995). A meta-analysis by Zhao et al. (2010) finds a positive impact of openness and

conscientiousness and a negative impact of agreeableness and neuroticism on entrepreneurial intentions and performance. Two extant studies examine the influence of the Big Five personality traits on reward-based crowdfunding success (Gera & Kaur, 2018; Thies et al., 2016a). Both studies find strong evidence for a positive impact of openness on crowdfunding success. Whereas Thies et al. (2016) also find a positive effect of agreeableness and a negative effect of neuroticism, Gera and Kaur (2018) only find support for a positive effect of extraversion on funding success. While based on a similar methodology, neither study is in the context of equity-based crowdfunding. Table 10 below provides an overview of prior related empirical studies.

Table 10: Prior research on personality in equity- and rewards-based crowdfunding

Author	Sample	Funding type	Signal	Findings
Moritz et al., 2015a	23 participants in equity-based crowdfunding	Equity-based	Overall impression	- perceived sympathy, openness, and trustworthiness reduce information asymmetries
Bollaert et al., 2019	14968 campaigns (Indigogo)	Reward-based	Narcissistic language	- narcissistic entrepreneurs have lower funding goals, longer campaign duration, and reach their campaign goals less often
Anglin et al., 2018b	1863 campaigns (Kickstarter)	Reward-based	Narcissistic language	- u-shape between rhetoric and funding success
Anglin et al., 2018a	1726 campaigns (Kickstarter)	Reward-based	Positive psychological capital	- positive psychological capital language positively influences campaign success
Gera & Kaur, 2018	4121 campaigns 4033 creators' profiles (Kickstarter)	Reward-based	Personality in text	- success is associated with openness and extraversion
Thies et al., 2016a	33,420 campaigns (Kickstarter)	Reward-based	Personality in video and text	- entrepreneurs/entrepreneurial teams who signal openness and agreeableness are more successful - neuroticism negatively impacts the success

A central mechanism that links perceived personality of entrepreneurs and potential backers' investment intention is trust. Trust can be related with someone's commitment (e.g., Morgan & Hunt, 1994), competency, their networking capability and

social capital (i.e., network ties) and to the idea itself. From implicit personality theory (Asch, 1946), we know that personality perceptions hereby shape these impressions. Implicit stereotypes have been shown to play a role in crowdfunding, for example in the case of gender (Johnson et al., 2018).

Here however, we must distinguish between the impact of perceived personality traits on investment intention (e.g., as captured by third-party raters) and on actual equity crowdfunding investments. While these decision scenarios are somewhat similar, equity crowdfunders have real money (typically 1,000 USD or more) at stake in resolving information asymmetries and are therefore likely to incorporate a wider range of quality signals (e.g., investment-based risks/hard facts). When potential investors rate a pitch video, their attention is on the entrepreneur (e.g., intangibles) and ideas and these are the information aspects where asymmetry can be particularly reduced in gaging whether or not they would hypothetically invest. In the case of actual investments, attention is likely to shift somewhat away from only the entrepreneurs' personality and her idea to investment-based risk (and more tangible hard facts of the campaign), though more is at stake in the real-life investment scenario, an irreversible long-term commitment in equity crowdfunding.

Regarding personality impressions, first, openness to experience is associated with the need for variety, creativity, and intellectual curiosity (Costa Jr & McCrae, 1995). People who express a highly open personality are socially skilled and thought to be good salespeople with greater-than-average management skills (Almlund et al., 2011; Costa Jr & McCrae, 1995). They also show higher motivation to reach self-set goals (Judge & Ilies, 2002). A meta-analysis conducted by Zhao et al. (2010) suggests a relation between high openness and entrepreneurial intentions and success. "Soft" clues about an

entrepreneur's perceived openness (e.g., implicitly associated with their creativity and motivation) in pitch videos and campaign narratives reduce information asymmetry between entrepreneurs and potential investors. These indicate the entrepreneurs' innovation potential (any by extension that of her product or service), facilitating their investment intention such that:

H1a*: Entrepreneurs' openness, as perceived by third-person raters based on the pitch video, will positively correlate with investment intention.*

Conscientiousness stands for achievement-orientation, hard work, organization, attention to detail, dutifulness, and self-discipline; Conscientiousness is also a predictor of in- and extrinsic career success as well as job performance and even wages (Almlund et al., 2011; Hogan & Ones, 1997; Judge et al., 1999). Researchers report a positive correlation between an entrepreneur's conscientiousness and long-term venture survival (Ciavarella et al., 2004). The meta-analysis conducted by Zhao et al. (2010) also shows a significant effect of entrepreneurs' conscientiousness and entrepreneurial intentions and outcomes. Further, conscientious people feel a sense of duty and involvement regarding projects in which they participate (Bozionelos, 2004), positively impacting their commitment. Based on the above, it can be concluded that conscientious personalities are preferred by investors when making quality judgements of entrepreneurs or startup teams. Receiving information cues about the entrepreneur's conscientiousness will be implicitly attributed to impressions of them as hard-working, detail-orientated and achieving regarding their startup campaign, reducing uncertainty of potential investors in the crowd. From the above, therefore, we posit that:

***H2a**: Entrepreneurs' conscientiousness, as perceived by third-person raters based on the pitch video, will positively correlate with investment intention.*

Extraverted people are sociable, optimistic, ambitious, dominant, and excitement-seeking (Bozionelos, 2004; Watson & Clark, 1997). Extroverted people tend to need a central position in their working environment to satisfy their strivings (Bozionelos, 2004). Despite this need, extroverted people are good at maintaining and expanding contacts, which leads to both high quantity and quality of social networks (Ciavarella et al., 2004). A growing finance literature argues that social connections can mitigate information asymmetry. Thus, social connections are known to promote trust and information exchange (Granovetter, 2018; McPherson, Smith-Lovin, & Cook, 2001) and facilitate easier communication (Bhagwat, 2011; Hegde & Tumlinson, 2014). We therefore expect that extraversion cues in the entrepreneurs' campaign communication will reduce information asymmetry between entrepreneur and (potential) investors, facilitating their intention to invest and ultimately could lead to additional funding. Therefore, we posit that:

***H3a**: Entrepreneurs' extraversion, as perceived by third-person raters based on the pitch video, will positively correlate with investment intention.*

People with high scores on agreeableness tend to be seen as altruistic, friendly, flexible, courteous, forgiving, and modest and are generally described as trustworthy and warm (Almlund et al., 2011; Barrick et al., 2001; Bozionelos, 2004). While agreeableness implies willingness for cooperation and a need for harmony, this also creates a potentially risky dependency on others (Bozionelos, 2004). Yet, this trait could still help receive the necessary social and financial support for a new venture (Ciavarella et al., 2004), and

crowdfunding investors want to help others in realizing their ideas (Mollick, 2014). Regarding investment intention, Kang et al. (2016) find that relational and calculative trust cues enhance the willingness to invest in equity crowdfunding. Trust signals have also been shown to play a key role in other forms of crowdfunding, particularly the donation-based form (Liu et al., 2018; Simon et al., 2019; Wang et al., 2019b). Further, low trustworthiness seems to act as a deterrent to participation in crowdfunding (Gerber & Hui, 2013). Increased perception of the entrepreneur as trustworthy via cues of their agreeableness should reduce information asymmetry between entrepreneurs and potential investors (observers rating their pitch video), ultimately leading to higher funding intentions. Therefore, overall, we argue that:

H4a*: Entrepreneurs' agreeableness, as perceived by third-person rates based on the pitch video, will positively correlate with investment intention.*

Neuroticism (referred to as emotional stability when reverse-coded) is a trait related to the experience of negative emotions (Bozionelos, 2004). People with a high expression of this trait tend to worry and are described as pessimistic, irritable, insecure, and lacking social skills (Bozionelos, 2004). People with high scores in neuroticism are also less goal-oriented and unable to cope with uncertainty and change. Therefore, unsurprisingly, research has uncovered negative associations between neuroticism and job search efforts, work performance, performance motivation, and extrinsic success (Almlund et al., 2011; Judge & Ilies, 2002). Further, as managing performance pressure and coping with different expectations is a requirement for the success of entrepreneurs and entrepreneurial teams (Ciavarella et al., 2004), a high expression of neuroticism is an important (negatively perceived) information cue in crowdfunding, increasing the

uncertainty about the long-term prospects of the venture. Therefore, these negatively perceived information cues would be seen as risks, reducing information asymmetry for potential investors. Therefore, we posit that:

***H5a**: Entrepreneurs' perceived neuroticism (emotional instability), as perceived by third person raters in the pitch video, will negatively correlate with investment intention.*

Many studies employing third-party personality ratings show the predictive power of such ratings and their transferability to the "real world". Examples stretch from the working environment ((Mount, Barrick, & Strauss, 1994) to the entrepreneurship context (Mutschmann, Hasso, & Pelster, 2022; Zhao et al., 2010). The studies show that the personality ratings of third persons not necessarily acquainted with the persons they are rating and recruited from the general population via surveys lead to personality measures that can make statements about actual behavior. Further, since the JOBS Act in 2012, non-accredited investors are able to invest in equity crowdfunding, making this form of alternative financing accessible to the general population (Ahlers et al., 2015) and thereby, further enhancing the relevance of measures obtained from this group. Therefore, we argue that the third-person ratings conducted within our study also correlate with crowdfunding success, proving that the personality traits perceived by the general population are linked with the perception of crowdfunding investors. To investigate these premises, we include five additional hypotheses, testing the effects of the related personality on the actual success of the respective equity crowdfunding campaigns (equity raised within the campaigns).

***H6a**: In equity crowdfunding, entrepreneurs' openness, as perceived by third-person rates based on the pitch video, will correlate positively with actual funding success.*

***H6b**: In equity crowdfunding, the entrepreneurs' conscientiousness, as perceived by third-person rates based on the pitch video, will correlate positively with actual funding success.*

***H6c**: In equity crowdfunding, the entrepreneurs' extraversion, as perceived by third-person rates based on the pitch video, will correlate positively with actual funding success.*

***H6d**: In equity crowdfunding, the entrepreneurs' agreeableness, as perceived by third-person rates based on the pitch video, will correlate positively with actual funding success.*

***H6e**: In equity crowdfunding, the entrepreneurs' perceived neuroticism (emotional instability), as perceived by third-person rates based on the pitch video, will correlate negatively with actual funding success.*

4. Methodology

4.1 Video-metric approach

To answer our research question and test our hypotheses, we follow a quantitative (positivist) empirical approach based on survey. Specifically, in order to measure the personality traits of entrepreneurs, we use naïve observer ratings and a video-metric technique. Both have clear advantages for our investigation. On the one hand, acquaintance-free ratings protect against certain social biases. Observers seem to have a "clearer lens" when rating others than people have while rating themselves (Connelly &

Hülsheger, 2012). They are not influenced by biases such as social desirability (Petrenko, Aime, Ridge, & Hill, 2016) or impression management (Oh, Wang, & Mount, 2011).

Further, researchers distinguish between internal and external aspects of an individual's personality (Connelly & Hülsheger, 2012). While interacting with the environment, only the external part of a person's personality seems to matter and affect an outcome (Hogan & Shelton, 1998). While self-reports of personality reflect both internal and external components, observer-ratings conducted by strangers are advantageous in that they focus on the behaviorally relevant (external) aspects of personality.

The chosen video-metric approach is also advantageous for the realization of our study, as founders and CEOs are difficult to address directly (Hill, Petrenko, Ridge, & Aime, 2019). Video material about founders and CEOs is often openly available since equity crowdfunding platforms typically require or highly suggest utilizing a pitch video as a key part of the funding campaign. Therefore, the video-metric approach unlocks many such individuals for research (Petrenko et al., 2016) while allowing us to reach a greater number of participants. Originally used to predict election outcomes (Benjamin & Shapiro, 2009), several scientists utilize this approach in personality research (Gupta, Nadkarni, & Mariam, 2019; Petrenko et al., 2016), revealing promising results in support of this method, even within the related context of IPOs (Blankespoor, Hendricks, & Miller, 2017).

To measure personality, we use the Ten-Item Personality Inventory (TIPI-G) (Gosling et al., 2003). This survey instrument has been successfully utilized for observer ratings and has proven robust validity in comparison with other personality measurements (Muck, Hell, & Gosling, 2007).

4.2 Data collection

Our study uses data provided on the homepages of two leading equity crowdfunding platforms in the U.S., StartEngine, and Wefunder. All observed campaigns are regulation CF offerings (JOBS Act Title III, 2016), which means both non-accredited and accredited investors can invest in these campaigns. From a complete sample database covering campaigns from September 2016 up to March 2020, we randomly selected a sample of 100 crowdfunding campaigns from those where the entrepreneur was visible. We included the representative campaign pitch videos in an observer-rated questionnaire. To our knowledge, this study is the first to utilize actual investment data as well as observer ratings of personality and investment intentions in a comprehensive design within the context of (equity) crowdfunding.

In our study, we utilize the crowdfunding campaign page pitch videos provided by the respective founding teams. To ensure similar conditions between the actual crowdfunding investment context and our questionnaire, we include the original videos from the campaign page without cutting the length of the videos.

As a first step, we integrated our videos into a questionnaire using the software platform Unipark. This platform allows us to adhere to the EU data protection guidelines (GDPR). The questionnaire included the Ten-Item-Personality-Inventory (TIPI-G) to allow participants to assess the entrepreneurs' personality (Gosling et al., 2003; Muck et al., 2007), a tool used successfully in several previous studies (e.g., Myszkowski, Storme, & Tavani, 2019; Romero, Villar, Gómez-Fraguela, & López-Romero, 2012), and ratings for the investment intention of observers. During the course of the questionnaire, observers had to rate a randomized selection of 5 videos. Second, before our core investigation, we pretested the questionnaire and the measurement method via the think-

aloud method (Ericsson & Simon) to ensure an understandable and intuitive design. Third, we recruited raters for the study via the platform SurveyCircle between April and July 2021. Raters were incentivized for participation by having the option to partake in a lottery for two Amazon gift cards of approximately 27 USD each. Lottery participation has been shown to increase online survey participation, bringing in a wider audience, and to increase completion rates, reducing drop-out bias (Göritz, 2010; Zhang, Lonn, & Teasley, 2017).

During the survey, after reading a brief introductory text and confirming informed consent, raters were asked to indicate their own personality (TIPI-G) in addition to their demographics and level of English.[17] Subsequently, we instructed the participants to watch the pitch videos and then rate the speakers' Big Five personality traits via the TIPI-G on a 7-point Likert scale from 1, disagree strongly, to 7, agree strongly. Example items include, “I see the person observed in the video as extraverted, enthusiastic” (Extraversion) and “I see the person observed in the video as dependable, self-disciplined” (Conscientiousness). The ratings were conducted online as well as in the Heinrich Heine University's Research Lab.

In addition to the data gathered with the questionnaire, we extracted information, including the actual investment amount contributed and the number of investors from the crowdfunding campaign page, and the disclosed crowdfunding filings of the Security and Exchange Commission (SEC). Finally, we compare two subgroups of our survey participants: those with and without crowdfunding experience, using both simple t-tests

[17] While one author received IRB training at a U.S. institution (anonymized for peer review) and we made an effort to conform to these guidelines, ethical approval for the survey was granted by the chair of the institute, as is common in Western Europe.

and Mann-Whitney u-tests (i.e. rank-sum tests, which are recommended by statisticians for group comparison tests using smaller sample sizes) as a robustness check.

This study design offers another important advantage. Because the explanatory and dependent variables were collected from different sources at different times, the collection of measurements is separated both temporally and methodologically, reducing common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For ease of interpretation and comprehension, we use OLS regression with a fixed effect for the platform the respective campaign was run on (implemented as the areg command in Stata). Further, to account for the structure of the data (100 videos with 5 ratings per participant), we report clustered standard errors (clustered by ID) in our regression models.

4.3 Variables

4.3.1 Dependent variables

As dependent variables, we use both the survey-based measure of *investment intention* (Cumming, Hervé, Manthé, & Schwienbacher, 2020; Greenberg & Mollick, 2017; Kang et al., 2016; Strohmaier et al., 2019) and the *investment amount* (Ahlers et al., 2015) based on the post-hoc data from the actual funding campaigns. Investment intention is indicated by the observers after each pitch video with the help of a slider on a scale from 0 to 100 percent. The observers are asked how likely they would invest in the crowdfunding project just seen in the video. The variable investment amount is based on the actual final contribution amounts made by the investors on the equity crowdfunding platform for each respective project as manually assessed from the respective homepage by the authors. Since this variable was non-normal, we used the log-transformation of the variable to bring it closer to the normal distribution.

4.3.2 Independent Variables

The personality factors included in this study are derived from the Big Five model from psychology (McCrae & Costa, 1987), which focuses on five key traits: *openness* (e.g., to new experiences), *conscientiousness* (e.g., dependability, self-disciplined), *extraversion* (e.g., outgoing. enthusiastic), *agreeableness* (e.g., sympathetic, warm), and *neuroticism* (i.e., emotional instability) (Gosling et al., 2003). We collect these variables using the German version of the Ten-Item-Personality-Inventory and observer-rated videos (TIPI-G) (Muck et al., 2007). Observers rate the expression of the mentioned traits on ten 7-point Likert scales (Appendix A.2.1), which are subsequently combined to one value for each trait following the guideline provided by Gosling et al., 2003.

4.3.3 Control Variables

To analyze the personality effects on actual investment amounts, we include a set of control variables recommended in the literature. As perceived project quality shapes investors' overall impression of a crowdfunding campaign (Bi et al., 2017) and, therefore, influences the effect that other signals have on crowdfunding success (Mollick, 2014), we include the *word count* of the campaign and video text (Bi et al., 2017), media use (e.g., *number of pictures*) (Courtney et al., 2017) and the *number of updates* and *comments* (Block et al., 2018; Courtney et al., 2017) as quality indicators (Mollick, 2014). Based on previous literature (Barbi & Mattioli, 2019; Mollick, 2014), we also control for *project size* (Ahlers et al., 2015; Vismara, 2016), *category* (Bapna, 2019; Mollick, 2014), *security type*, *number of employees* (Ahlers et al., 2015), company age (*established company*), the *year*, *campaign duration* (Anglin et al., 2018a; Mollick, 2014), the crowdfunding *platform*, and the state of the *jurisdiction* (Allison et al., 2015). Additionally, we control for the *video duration* and include a dummy (*multiple speakers*) if more than one person

is speaking within the video (Sellen, 1992). Finally, we control for the gender of the founder (*female founder*), founder *ethnicity* (African American, Caucasian, Hispanic, or Asian), as well as for project *innovativeness* using a bag-of words dictionary approach (McKenny, Aguinis, Short, & Anglin, 2018).

For the online questionnaire, as the third-party raters were provided no information on the campaign page (except for the pitch video itself), we dropped the variables number of comments, updates, pictures, word count, security type, year, campaign duration, and jurisdiction. In line with previous literature that shows the importance of pitch video quality in crowdfunding (e.g., Chan & Parhankangas, 2017; Chan, Parhankangas, Sahaym, & Oo, 2020), we control for *video quality*, an additional survey item that was rated on a 7-point Likert scale. All variables are explained in detail in Table 11.

Table 11: Description of variables.

Variable	Definition	Source
Campaign Variables		
Total funding (ln)	Natural logarithm of the received funding amount	Ahlers et al., 2015
Total Investors (ln)	Natural logarithm of the number of investors contributed to the funding	Ahlers et al., 2015
No. of Comments (ln)	Natural logarithm of the number of comments/number of questions posted on the campaign page	Courtney et al., 2017
No. of Updates (ln)	Natural logarithm of the number of updates posted on the campaign page	Block et al., 2018
No. of Pictures		
Multiple Speakers	Number of speakers visible in the campaign video	Sellen, 1992
Video Duration		
Project Size	Categorical variable that = 1 if Goalmax<107000; = 2 if Goalmax>=107000 & Goalmax<712162; = 3 if Goalmax>=712162 & Goalmax<1070000; = 4 if Goalmax>=1070000 (regulation C allows a maximum of $1,070,000 raised)	Ahlers et al., 2015; Vismara, 2016
Project Category	Economic sector of the company (adjusted according to the StartEngine categories)	Bapna, 2019; Mollick, 2014
Innovativeness	A percentage count of the usage of approximately 160 dictionary words that relate to innovation (e.g., creativity, dream, imagination, improvise, invent, prototype, R&D)	McKenny et al., 2018
No. of Employees	Number of employees the company has indicated in the SEC filing	Ahlers et al., 2015
Jurisdiction	Jurisdiction of the company launching the campaign is registered	Allison et al., 2015 (location)
Established Comp.	Companies active longer than 5 years	
Campaign Duration	Variable calculated with campaign deadline indicated in the SEC filing and the signature date of the document	Anglin et al., 2018a; Mollick, 2014
Female Founder	Equals one if the founder is female and zero otherwise.	Cicchiello and Kazemikhasragh 2022
Founder Ethnicity	A categorical variable indicating if the founder is African American, caucasian, hispanic, or asian (baseline)	Younkin & Kuppuswamy, 2018
Word Count	Length (in number of words) of the project description, updates presented, and video transcript.	Bi et al., 2017
Year	Year of the campaign launch (2016-2020)	
Platform	Categorical variable for the two crowdfunding platforms	
Survey Variables		
Investment Intention	Investment intention was indicated by the participants on a scale from 0 to 100 (see Appendix A.2.1)	(Cumming et al., 2020)
Openness Agreeableness Conscientiousness Extraversion Neuroticism	Personality trait (TIPI-G) rated by the observing participants on a scale from 1 to 7 (see Appendix A.2.1)	Gosling et al., 2003; Muck et al., 2007
Video Quality	Video quality was rated by the observing participants on a scale from 1 to 7	
Rater Variables		
Gender	Dummy variable coded 0 if participant is male and 1 if female	Cicchiello and Kazemikhasragh 2022
Education	A categorical variable denoting the education level of a participant: 1 indicates a high school degree or some college, 5 a Bachelor's degree, 6 a Master's degree and 7 a PhD or further professional/academic degree	Munim et al. 2020
Age	Positive integer value representing the age of survey participants	Munim et al. 2020

5. Results

In our survey, 236 people recruited via the online survey tool SurveyCircle, participated. Seventy-nine males, 155 females, and two non-binary participants with a mean age of *M*=25.65 (*SD*=5.42) participated in the study. While a majority of participants had no previous experience with crowdfunding (*n*=181), a subgroup did (*n*=55), allowing us to compare their personality ratings (more on this below). Participants also stated data on their level of English (Mean level: between B2 and C1, according to the Common European Framework of Reference for Language[18]) and their educational background (6 have no degree, 92 have a high school degree, and 138 have a university degree). Therefore, our participant pool is characterized by aspects typically found in crowdfunding investors, e.g., above-average education and below-average age (Bretschneider & Leimeister, 2017). The questionnaire resulted in a total of 1175 ratings of 100 randomly selected investor pitch videos. Regarding the gender and ethnicity of the founders in the videos, it is worth noting that 14.98% were female; 83.23% were Caucasian, while 16.77% belonged to an ethnic minority (Asian: 7.91%, Hispanic: 4.09%, African American: 4.77%). This matches the demographics of the leading equity crowdfunding platforms from which the campaigns were selected, where Caucasian males comprise the clear majority of founders. We list the representative descriptive statistics in Table 12 and 13.

[18] https://www.coe.int/en/web/common-european-framework-reference-languages

Table 12: Summary statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Campaign Variables					
Total funding (ln)	1175	352577.85	383507.76	12488.06	1699901
Total Investors (ln)	1175	394.462	521.848	8	3735
No. of Comments (ln)	1175	37.861	74.665	0	395
No. of Updates (ln)	1175	16.549	22.998	0	187
No. of Pictures	1175	52.46	24.674	2	136
Multiple Speakers	1175	.47	.499	0	1
Video Duration	1175	190.162	89.356	69	601
No. of Employees	1175	6.038	7.622	0	70
Campaign Duration	1175	93.197	57.954	2	362
Word Count	1175	7602.807	3259.521	2442	22817
Female founder	1175	.15	.357	0	1
Ethnicity - African American	1175	.048	.213	0	1
Ethnicity - Asian	1175	.079	.270	0	1
Ethnicity - Hispanic	1175	.041	.198	0	1
Ethnicity - Caucasian	1175	.832	.374	0	1
Innovativeness	1175	.984	.127	0	1
Survey Variables					
Investment Intention	1170	32.975	27.995	0	100
Openness	1175	4.992	1.286	0	7
Agreeableness	1175	4.837	1.186	0	7
Conscientiousness	1175	5.151	1.175	0	7
Extraversion	1175	4.948	1.372	0	7
Neuroticism	1175	2.886	1.1	0	6.5
Quality	1170	4.659	1.747	0	7

Complementing our descriptive results, below, we first compare and contrast the personality ratings of the survey participants with and without previous crowdfunding experience. The results show that the comparability of the ratings of the general population and of crowdfunding investors in particular are highly similar.

Table 13: Personality Ratings by Crowdfunding Experience and overall

Variable	Sample	Obs	Mean	Std. Dev.	Min	Max	T-test (p-value, two-tailed)	Ranksum (p-value, two-tailed)
	prev. CF exp.	275	4.96	1.318	0	7		
Openness	no prev. CF exp.	900	5.002	1.276	0	7	0.6383	0.6216
	all participants	1175	4.992	1.286	0	7		
	prev. CF exp.	275	5.145	1.244	0	7		
Conscientiousness	no prev. CF exp.	900	5.153	1.154	0	7	0.9225	0.9977
	all participants	1175	5.151	1.175	0	7		
	prev. CF exp.	275	4.86	1.36	0	7		
Extraversion	no prev. CF exp.	900	4.975	1.375	0	7	0.2238	0.1713
	all participants	1175	4.948	1.372	0	7		
	prev. CF exp.	275	4.913	1.184	0	7		
Agreeableness	no prev. CF exp.	900	4.813	1.187	0	7	0.2241	0.334
	all participants	1175	4.837	1.186	0	7		
	prev. CF exp.	275	2.84	1.149	0	6.5		
Neuroticism	no prev. CF exp.	900	2.9	1.085	0	6.5	0.4289	0.3688
	all participants	1175	2.886	1.1	0	6.5		

We calculated two sets of regression models based on the personality ratings with either the participants' investment intention or the actual crowdfunding campaign funding outcome as the dependent variable. We describe our regression results based on Tables 14 and 15. Table 14 focuses on the dependent variable investment intention rated by the participants after each video. Model 1 shows the effects of the control variables. Models 2-6 show the main effect of the Big Five personality traits, including the control variables. Model 7 presents the full model, including all personality variables and the controls, which explain 38,1 percent variation in investment intention (R^2=.381). Table 15 focuses on the dependent variable funding amount, the log-transformed correlate of investors' actual contributions (in U.S. Dollars) during the crowdfunding campaign. Model 1 shows the effects of the control variables, Model 2-6 show the main effect of the Big Five personality traits, including the control variables, and Model 7 presents the full model, including all personality variables and the controls, which explain 42,5 percent of the variation in funding intention (R^2=.425).

Table 14: OLS regression models (survey, DV: investment intention).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Video quality	7.918***	6.504***	6.234***	7.73***	7.153***	6.858***	5.284***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Multiple speakers	-3.003*	-3.437**	-2.511*	-3.221**	-2.508*	-3.547**	-2.956**
	(.055)	(.023)	(.09)	(.042)	(.094)	(.021)	(.041)
Video duration	-.003	-.004	.001	-.003	.001	-.001	.001
	(.674)	(.591)	(.854)	(.725)	(.937)	(.858)	(.89)
Project size	-3.174***	-3.221***	-3.738***	-3.357***	-2.51***	-3.495***	-3.304***
	(.001)	(.001)	(0)	(.001)	(.009)	(0)	(0)
Project category	-.136	-.128	-.094	-.148	-.068	-.166	-.088
	(.203)	(.217)	(.353)	(.17)	(.51)	(.108)	(.365)
# of employees	.127	.127	.148	.128	.095	.113	.118
	(.26)	(.24)	(.171)	(.259)	(.36)	(.287)	(.243)
Established	4.114**	4.27***	4.098***	4.137**	3.602**	4.152***	4.019***
company	(.011)	(.008)	(.009)	(.01)	(.022)	(.009)	(.009)
Female founder	-2.668	-3.079	-2.208	-2.728	-3.964**	-.191	-1.64
	(.173)	(.121)	(.26)	(.165)	(.038)	(.922)	(.405)
Ethnicity:Afr.Am	-3.374	-5.237	-4.306	-4.013	-3.023	-4.428	-5.06
	(.497)	(.288)	(.361)	(.419)	(.531)	(.355)	(.278)
Ethnicity:Hisp.	-13.014***	-14.917***	-11.436***	-13.676***	-11.885***	-13.346***	-12.568***
	(.004)	(.001)	(.008)	(.003)	(.009)	(.003)	(.005)
Ethnicity:Cauc.	-6.847**	-6.567**	-6.835**	-6.854**	-6.259**	-6.291**	-6.1**
	(.019)	(.023)	(.015)	(.019)	(.029)	(.026)	(.027)
Innovativeness	1.972	2.475*	2.25	2.23	.505	3.004**	2.297*
	(.196)	(.093)	(.122)	(.144)	(.731)	(.042)	(.099)
Part. age	-.225	-.286	-.267	-.24	-.236	-.274	-.309
	(.321)	(.226)	(.219)	(.291)	(.291)	(.205)	(.168)
Part. gender	5.968**	4.319*	4.162*	5.55**	4.959**	4.637**	3.062
	(.012)	(.068)	(.078)	(.02)	(.038)	(.047)	(.193)
Part. education	-.342	-.414	-.273	-.356	-.027	-.656	-.407
	(.818)	(.784)	(.858)	(.81)	(.986)	(.661)	(.796)
Openness		4.943***					3.267***
		(0)					(0)
Conscientiousness			6.113***				3.456***
			(0)				(0)
Extraversion				1.052*			-.934
				(.083)			(.12)
Agreeableness					4.686***		1.75**
					(0)		(.018)
Neuroticism						-5.75***	-3.412***
						(0)	(0)
Observations	1170	1170	1170	1170	1170	1170	1170
R-squared	.287	.329	.34	.29	.322	.331	.381
F-stat	22.984	26.833	29.493	21.855	28.954	29.77	30.167
RMSE	23.796	23.102	22.917	23.768	23.214	23.06	22.217
logl.	5359.93	5324.79	5315.39	5358.03	5330.43	5322.68	5277.07

Clustered standard errors in parentheses, constant not shown;
**** p<.01, ** p<.05, * p<.1*

Table 15: OLS regression models (survey, DV: funding amount).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Video quality	.102***	.09***	.088***	.108***	.102***	.099***	.085***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mult. visible	-.28***	-.284***	-.276***	-.274***	-.28***	-.282***	-.275***
speakers	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Video duration	0	0	0	0	0	0	0
	(.875)	(.86)	(.962)	(.84)	(.882)	(.887)	(.796)
Project size	.611***	.611***	.606***	.616***	.611***	.61***	.611***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Project category	.03***	.03***	.03***	.03***	.03***	.03***	.03***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
# of employees	.026***	.026***	.026***	.026***	.026***	.026***	.026***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Established	.092	.093	.092	.091	.091	.092	.097
company	(.166)	(.158)	(.163)	(.169)	(.167)	(.165)	(.137)
Female founder	.069	.065	.073	.07	.068	.076	.085
	(.369)	(.395)	(.344)	(.357)	(.378)	(.326)	(.282)
Ethnicity:Afr.Am.	-1.073***	-1.089***	-1.081***	-1.054***	-1.072***	-1.076***	-1.074***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Ethnicity:Hisp.	-.289	-.305	-.275	-.27	-.288	-.29	-.276
	(.182)	(.157)	(.198)	(.21)	(.183)	(.181)	(.19)
Ethnicity:Cauc.	-.168	-.165	-.168	-.168	-.167	-.166	-.167
	(.15)	(.159)	(.152)	(.151)	(.15)	(.154)	(.157)
Innovativeness	.258***	.262***	.26***	.25***	.257***	.261***	.266***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Part. age	-.002	-.003	-.002	-.002	-.002	-.002	-.002
	(.756)	(.697)	(.714)	(.803)	(.755)	(.74)	(.712)
Part. gender	-.034	-.048	-.049	-.022	-.034	-.037	-.041
	(.587)	(.439)	(.419)	(.729)	(.578)	(.545)	(.506)
Part. education	-.026	-.027	-.025	-.026	-.026	-.027	-.029
	(.553)	(.546)	(.561)	(.559)	(.555)	(.541)	(.511)
Openness		.043*					.068**
		(.088)					(.024)
Conscientiousness			.052*				.045
			(.066)				(.158)
Extraversion				-.03			-.059**
				(.194)			(.03)
Agreeableness					.003		-.037
					(.895)		(.206)
Neuroticism						-.017	-.011
						(.536)	(.712)
Observations	1170	1170	1170	1170	1170	1170	1170
R-squared	.419	.42	.421	.42	.419	.419	.425
F-stat	76.655	70.804	71.656	72.008	71.928	72.222	57.554
RMSE	.987	.986	.986	.987	.987	.987	.984
logl.	1636.29	1634.78	1634.46	1635.38	1636.28	1636.12	1630.51

Clustered standard errors in parentheses, constant not shown;
**** p<.01, ** p<.05, * p<.1*

We interpret the results of our hypotheses tests based on the main effect models (Model 2-6) of both tables (Tables 14 and 15). First, we find that perceived openness has

a positive and significant effect on investment intention (β=4.943, p<.001) in line with our prediction in H1. Second, we find that perceived conscientiousness has a significant positive influence on investment intention (β=6.113, p<.001), confirming our H2. Third, we find a positive and weakly significant effect of extraversion on investment intention (β=1.052, p=.083) as predicted in H3. Fourth, we find a significant positive effect of agreeableness on investment intention (β=4.686, p<.001) in line with our H4. Fifth, our results suggest a strong negative effect of neuroticism on funding intention (β=-5.75, p<.001), supporting our H5.

In addition, we find weakly significant results for the effect of perceived openness on the actual final funding amount (β=.043, p=.088) as predicted in our H6a. Further, we find a weakly significant effect of conscientiousness on actual funding success (β=.052, p=.066), supporting our H6b. Our hypothesis 6c however does not reach significance for the actual investment amount (β=-.03, p=.194). The effect of agreeableness (H6d) also loses significance when shifting the focus to actual investments, i.e., on the amount funded (H4b; β=.003, p=.895). Last, the effect for neuroticism on actual investment amount remain negative but do not reach significance levels (β=-.017, p=.532) and we must reject our H6e. Finally, we find that investment intention and the level of funding received show a significant albeit not particularly high bivariate correlation (of .118, p<.001).[19]

Among our control variables, we find that some campaign- and company-specific variables play a role, as suggested by the literature. We report the significant control

[19] Also, if we run Model 7 (the full model with the Big Five based on the survey and investment intention as the DV), and replace the log-transformed funding amount actually achieved as the DV, we find that perceived openness (β=.072, p=.022) and extraversion (β=-.077, p=.006) based on the survey remain significant predictors of actual funding and that the effect directions of the Big Five remain the same for all but perceived agreeableness (β=-.04, p=.179). Results are similar if we regress the number of investors in the campaign against the Big Five based on the survey ratings, with significant predictors being perceived openness (β=.084, p=.01) and extraversion (β=.081, p=.005), respectively.

variables from both tables for the first respective models (that include only the control variables and not the perceived personality constructs). For the investment intention, we find, negative effects for project size (β=-3.174, p=.001), which seems intuitive as a larger project clearly also carries a larger risk. On the other hand, we find strong positive significant effects for established companies (β=4.114, p=.011) and for video quality (β=7.918, p<.001). Further we find a significant effect of survey participants' gender on investment intention (β=5.968, p=.012), such that men tend to have higher intentions to invest in crowdfunding campaigns. We also found a significantly lower investment intention if the founders were Hispanic (β=-13.014, p<.001) or Caucasian (β=-6.847, p<.001). For the models examining the total investment amount raised, besides the aforementioned effects of founder ethnicity (which remain highly similar and significant here), we find significant positive effects of project size (β=.611, p<.001) and the number of employees (β=.026, p<.001). We also find significant effects for the project category (β=.03, p<.001) in line with previous literature (e.g., Chan & Parhankangas, 2017). In addition, we find a significant influence of information quantity as proxied by the video duration (β=.001, p<.001), also in line with previous literature on the role of "soft" information cues in crowdfunding (e.g., von Selasinsky & Isaak, 2020).

5.1 Robustness Checks

To validate our findings, we ran a number of robustness tests. First, we ran full models with all the Big Five factors and control variables in a single model for both dependent variables, investment intention, and the (actual) funding amount achieved. We find that for the dependent variable *investment intention*, all effect directions except extraversion remain the same in the full model and that four out of five of the personality predictors retain significance (O: β=3.267, p<.001; C: β=3.456, p<.001; E: β=-.934,

p<.12; A: β=1.75, p<.018; N: β=-3.412, p<.001). For the full model with the dependent variable *investment amount*, the factor perceived conscientiousness loses significance, but the factor extraversion becomes significant (O: β=.068, p=.024; C: β=.045, p=.158; E: β=-.059, p=.03; A: β=-.037, p=.206; N: β=-.011, p=.712).

We also ran an alternative model with the number of investors as the dependent variable (Table 24) as an alternate measure of campaign success (e.g., Ahlers et al., 2015; Block et al., 2018; Vulkan et al., 2016) and found that perceived openness (β=.06, p=.021) and conscientiousness (β=.06, p=.041) remain robust to this measure and significantly predict investor volume of a campaign. Extraversion is significantly predictive of the number of investors only in the full model (β=-.06, p=.031) in line with our findings for the dependent variable investment amount above.

6. Discussion and Implications

Regarding our groupwise comparison tests between the subjects with and without crowdfunding experience (Table 13), the ratings look highly similar overall. Those without previous crowdfunding experience tend to rate entrepreneurs in the pitch video slightly higher on extraversion and slightly lower on agreeableness, though even these differences are nowhere near significant (p=.17 to p=.33). Overall, these results indicate that personality ratings of entrepreneurs from members of general population are largely equivalent to those of crowdfunding investors. This is not totally surprising, since even in the case of equity crowdfunding, investors in the crowd are not comparable to professional investors who are legally required to conduct considerable due diligence before investing (e.g., on behalf of pension funds).

Regarding our regression results, first, our finding that perceived openness of the entrepreneur positively predicts funding intention (H1) supports findings that open people

are thought to be socially skilled and good salespeople (Almlund et al., 2011; Costa Jr & McCrae, 1995), critical skills for an early-stage venture when new customer acquisition and building social capital are critical to growth and survival. The findings are also in line with research on entrepreneurial personality (Obschonka & Stuetzer, 2017). In particular, the results on openness show that perceived innovativeness of the entrepreneur (and by extension the venture) is a key decision criterion for both investment intention and real-life funding success.

Second, we find that perceived conscientiousness positively predicts funding intention (H2). Therefore, third-party raters seem to reward entrepreneurs that are perceived as disciplined, hard-working, dedicated and committed. These findings are also in line with findings in rewards-based crowdfunding by Bernardino and Santos (2016) and with predictions of the entrepreneurial personality system (Obschonka & Stuetzer, 2017).

Third, we find a positive and significant effect of entrepreneurs' extraversion, as perceived by crowd investors, on funding intention (H3a). This results for extraversion are in line with previous results on this trait in rewards-based crowdfunding (e.g., Thies et al., 2016a vs. Gera & Kaur, 2018).

Fourth, the perceived agreeableness of the entrepreneur significantly predicts investment intention (supporting our H4). This strengthens the argumentation that trust, a facet of agreeableness, is a key driver in crowdfunding, as shown e.g., in lending based crowdfunding (Liu et al., 2018; Simon et al., 2019; Wang et al., 2019b).

Fifth, we find that perceived entrepreneurs' neuroticism (i.e., emotional instability) as perceived by crowd investors, negatively predicts investment intention (H5a) supporting our initial hypothesis. This is in line with our argumentation that

trustworthiness is an important factor in equity crowdfunding and with findings that low trustworthiness seems to act as a deterrent to participation in crowdfunding (Gerber & Hui, 2013).

Our overall finding that all five of the Big Five personality traits as perceived by third-person raters shows a significant bivariate correlation with funding intention is a strong sign that human capital signals in entrepreneurs' video pitches are, in fact, playing a role in crowd investor decision making in equity crowdfunding (e.g., Piva & Rossi-Lamastra, 2018), reducing information asymmetry between entrepreneurs and investors, and that investment intention is an overall good predictor of funding success. This is also in line with the study by (Cumming et al., 2020) who found that aggregate investment intentions are a strong predictor of actual campaign success. Our robustness checks lend further support to these findings and also show that not only do perceived personality cues impact actual funding success but also the total number of investors in a campaign and, therefore, its reach. Finally, to further investigate how third-person raters decided on their investment intentions, we exploit a control item in our questionnaire, the results of which we summarize in Table 25 of the Appendix.[20]

For our sixth hypothesis we find mixed support: While we find that openness and conscientiousness as perceived by third-person raters weakly correlate with the actual funding amount achieved by the campaigns, the other traits lose their significance. A possible explanation for this finding is the lower salience of personality traits when mixed

[20] From it we can see that when participants rated the entrepreneurs in the pitch video, they paid particular intention to whether or not they trusted them, perceived them as competent, serious, confident, friendly/likeable, based on their gut feelings and the success prospects for the company and product/idea; they also looked for professionalism and for innovativeness of the idea and potential of the market and business model. This is quite revealing about the pitches in that clearly the central criteria for making actual investment decisions are being transported in the video pitches: that is, they do capture key aspects of the campaign that would typically be included on the campaign page, albeit in a more compressed fashion.

with all the additional information investors can access on a crowdfunding campaign page. From the perspective of signaling theory, the less ambiguous a signal is, the more effective it can be because it is easier for the receiver to attach a meaning to it and utilize it to infer its sender's unobserved quality (Epstein & Schneider, 2008). States another way, when having only the pitch video to judge, the full attention is on the entrepreneur and therefore his or her personality is more present.

We investigate our research question through the lens of information asymmetry and Signaling theory. This allows us to adapt the concept of personality to the new context of equity crowdfunding and to make several contributions to the literature. First, by examining the effects of the Big Five personality traits in the context of the U.S.-based equity crowdfunding market, our findings contribute to research on signaling in crowdfunding in entrepreneurship and information systems (Ahlers et al., 2015; Ahrens et al., 2019; von Selasinsky & Isaak, 2020) and relate to research on which personality traits are helpful for entrepreneurial teams in obtaining classical venture capital (e.g., Mitteness et al., 2012; Murnieks et al., 2015). Our study provides supportive evidence that low-cost or costless signals are indeed in play a role in crowdfunding (e.g., Anglin et al., 2018a).

Second, this study extends the broader literature stream on the relationship between entrepreneurial success and personality, providing new input to a longstanding and central debate on the impact of individual-level components on entrepreneurial outcomes (e.g., Zhao et al., 2010) in the underexplored alternative finance market.

Third, with our unique study design, an empirical contribution is that we bridge information on the investment intention (e.g., Cumming et al., 2020) of survey participants and actual investor contributions (Ahlers et al., 2015; Isaak et al., 2021).

Therefore, we show that investment intention, as indicated by third-party observer ratings, is largely indicative of "real-life" investments made in equity crowdfunding. To our knowledge, no other study investigates both sides of the investment context, indicating how intention is translated into action in the crowdfunding context.

Fourth, we show that in equity-based crowdfunding, personality signals favored by investors in the crowd show fewer similarities to reward-based crowdfunding (Thies et al., 2016a) than to evaluations by angel investors (Murnieks et al., 2015). This result can help us to better understand the investors that contribute to equity-based crowdfunding campaigns.

Our study also has practical implications. First, our results can help equity crowdfunding investors and coaches better differentiate which personality traits signaled in pitch videos, and project descriptions are predictive of funding success. Second, startups that plan to pursue equity crowdfunding could increase their self-awareness regarding the personality signals communicated in their campaign and thereby optimize their message to the crowd. Finally, for equity crowdfunding platforms, our results can feed into improved risk management of startup portfolios (e.g., as screening criteria for platform listing).

7. Limitations and Future Research

While featuring almost 1,200 individual ratings, our study relies on randomly selected pitch videos from two leading U.S.-based equity crowdfunding websites. This implies that our results may or may not generalize to platforms based in other countries (given cultural differences) or other types of crowdfunding (given different incentive structures and user bases, e.g., degree of investor sophistication). We know from similar contexts that cultural factors influence investment decisions (Perry et al., 2015); therefore,

future studies should examine the impact of entrepreneurs' perceived personality on crowdfunding success in other regions such as East Asia and South America.

Second, a limitation of the study was that third-party raters viewed only the pitch video. This was a design decision that followed a careful cost-benefit analysis on the number of participants and the length to complete the survey. While the literature suggests that the investor pitch is a central aspect when judging entrepreneurs' personality (e.g., due to non-verbal cues and rapid judgements (Rule & Ambady, 2010)), the different results for extraversion could stem from participants rating only the investor pitch video, whereas crowdfunding investors also judge the campaign page, perhaps deemphasizing the otherwise unique role of the pitch video in terms of personality displays.

Also, studies should consider not only alternative measures of campaign success but also post-campaign outcomes such as whether or not a venture received venture capital after the crowdfunding campaign or whether or not startups survived (e.g., after five years). Also, while we include a large number of control variables, future studies could examine interactions between signals.

E. Essay 4: Show of Strength: Extraverted CEOs and IPO Success in Established and Young Companies[21]

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E. Essay 4: Show of Strength: Extraverted CEOs and IPO Success in Established and Young Companies

1. Abstract:

Successful initial public offerings are a big step towards a thriving corporate future. However, which factors make some IPOs perform better than others? Since the Upper Echelon Theory, many scientific studies have supported that a manager's personality can predict company success. Our study applies this theory and investigates the influence of CEOs' personalities on IPO success, focusing on the Big Five personality trait extraversion. High expressions of this trait can prove helpful for CEOs because it is related to strength signals such as dominance and ambition. Furthermore, the IPO process is characterized by high uncertainty for investors, even more so when investing in young, unestablished companies. In this context, signals of strength are even more crucial because they imply CEOs' confidence. Our study uses over a thousand CEO earning calls and the Open Language Chief Executive Personality Tool (OLCPT) to measure CEOs' extraversion combined with SEC information on the IPO process and IPO success variables from the Ritter database and Thomson Reuters Eikon. We find supporting evidence that expressed extraversion positively affects the market value of a company at the time of the IPO and after, as well as the degree of underpricing. Further analysis reveals significant positive effects for the interaction of CEO extraversion and the company age on underpricing. To understand the respective mechanisms we employ signaling and upper-echelon theory regarding CEO personality signals to the context of initial public offerings. Utilizing a narrative approach, we can show that signals of CEO extraversion affect the IPO process. Moreover, these effects differ between established and young companies. We, thereby, contribute to the research on which personality traits are helpful for CEOs in obtaining capital.

2. Introduction

Acquiring financial capital is one of the most important tasks for companies, as it is crucial to have the resources for expanding, developing new products, and research, to name only a few. Further, it can help navigate a company through economic crises and mitigate the results of misguided managerial decisions. One way for a company to acquire capital is via public offerings. Successful public offerings are one step toward a thriving corporate future. However, what factors make some companies raise more capital, leave less money on the table, or enter an IPO with a higher market value? Since the Upper Echelon Theory (Hambrick & Mason, 1984) was formulated, a large base of scientific experiments has supported the idea that the character of a manager can be used to predict a company's success due to its' influence on the manager's decisions (Bertrand & Schoar, 2003). In our study, we transfer this theory to our research context and investigate the impact of a Chief Executive Officer's (CEO's) character on the firm's financial success regarding initial public offerings (IPOs).

When it comes to the character of a CEO, the scientific debate in management science has focused on the concepts of charisma and humility (Chandler, Petrenko, Hayes, Blake, & Aime, 2023), overconfidence (Malmendier & Tate, 2005), the dark triad (i.e., narcissism, Machiavellianism, and psychopathy (Palmer, Holmes, & Perrewé, 2020), core self-evaluation (i.e., self-esteem, self-efficacy, locus of control, and emotional stability) (Hiller & Hambrick, 2005) and Big Five personality traits (i.e., openness, conscientiousness, extraversion, agreeableness, and neuroticism) (Harrison et al., 2019).

One of these Big Five personality traits is of particular interest when investigating CEOs: extraversion. This trait can predict the job performance of managers and salespeople and the likelihood of reaching a leadership role (Barrick & Mount, 1991;

Ciavarella et al., 2004; Judge et al., 1999). Extraverted CEOs have been shown to improve the cost efficiency and profitability of their companies (Wang & Chen, 2020). Their extraverted personality is related to improvements in investor recognition, sales growth, and corporate acquisitions but also has consequences for the perceived riskiness of a company (Aabo, Hanousek, Pantzalis, & Park, 2023; Green, Jame, & Lock, 2019; Harrison et al., 2020). All in all, extraversion is related to confidence and leadership and, thereby, crucial for CEOs facing an IPO to signal investors that the company is in solid and safe hands. With this research we therefore try to answer the research question: Does displayed CEO extraversion impact IPO success?

In the context of IPOs, investors gather information on CEOs and their personalities by paying close attention to their public appearances before going public. Within these appearances (e.g., the IPO roadshow), CEOs can send signals of their strength and the bright prospects of their company. Investors base their decisions on whether to invest on, amongst other, the signals they receive. This process is theoretically embedded in the concept of the Signaling theory. Originally developed in the context of job marketing, the theory considers signals as a medium to reduce information asymmetries between two parties (Spence, 1978). In startups, for example, founders use (costly) signals to provide information on their firm's quality and their suitability as a company leader (Courtney et al., 2017). Indeed, studies show a positive impact of signaling characteristics on the likelihood of raising capital via IPOs or equity crowdfunding (Baum & Silverman, 2004; Blankespoor et al., 2017; Chan & Park, 2015). Initial public offerings (IPO) describe the event a company must go through to be listed on the stock exchange. The IPO process is characterized by high uncertainty, encouraging

many authors to use Signaling theory to investigate firm performance in the IPO context (Daily, Certo, & Dalton, 2005).

Based on the prior research, the reasoning mentioned above, and signaling theory, we expect CEOs who display a personality characterized by high extraversion to be more likely to succeed in their initial public offerings, as investors see CEO extraversion as a signal to reduce their uncertainties. Furthermore, we assume that this effect is pronounced for young and unestablished firms that often have lower reporting standards. For example, emerging growth companies (EGCs) (annual gross revenue > $1,000,000,000) can submit confidential draft registration statements permitting them to begin the IPO process without disclosing sensitive business information that are usually required within a draft registration statement of an established firm (JOBS Act, 2012[22]).

To measure CEOs' personality traits, we use the dictionary based Open Language Chief Executive Personality Tool (OLCPT) (Harrison et al., 2019) and a sample of unscripted spontaneous verbal expressions of CEO spoken language recorded within quarterly earning calls of companies.

This study contributes to the finance literature by researching the relationship between CEO personality and IPO success. Located at the interface between economics and psychology, it adds value to both disciplines and the shared research areas as well as the theory. First, it reinforces and extends the Upper Echelon Theory by highlighting that the extraversion trait of CEOs is significantly associated with IPO success, thereby adding a nuanced understanding to the theory. Second, it provides empirical evidence that extraverted CEOs can positively influence a company's market value, underscoring the broader relevance of personality psychology in financial contexts, suggesting that

[22] Jumpstart Our Business Startups Act, Pub. L. No. 112-106, 126 Stat 306 (5. Apr. 2012)

personality assessments could become an integral part of executive evaluations and investor considerations. Third, by applying signaling theory to the context of IPOs, our study emphasizes that CEO extraversion serves as a crucial signal to potential investors. It reduces information asymmetry, which is a common issue in IPOs where investors often have less information than the company's insiders. CEOs' extraverted behavior during roadshows and public appearances can act as a signal of confidence and leadership, thereby influencing investor perceptions and decisions. Further, our study focuses on narrative analysis of personality to predict financial success. To the best of our knowledge, this approach has not been used before in the context of IPOs. Our results can help better understand IPO investors' motives and drivers for funding decisions. Perusing this insight, CEOs who plan their firms' IPO can focus on signaling certain personality traits. In doing so, they could increase their chance of financial success. For investors, the findings imply that assessing CEO personality, particularly extraversion, could be a valuable part of due diligence when considering investments in IPOs.

3. Literature and Hypotheses Development

3.1 Information Asymmetry and Signaling

In efficient markets, asset prices reflect all available information (Fama, 1970); therefore, all participants have all available information. In contrast, information asymmetry refers to situations where some market participants have more information than others (Akerlof, 1970). Decisions are influenced by the information available in a specific context (Connelly et al., 2011) and affected by information asymmetries.

One way to address information asymmetries is through signaling (Connelly et al., 2011; Spence, 1978). Signaling theory describes how informed internal signalers can share relevant information with uninformed external receivers with information gaps

(Block et al., 2018; Connelly et al., 2011; Spence, 1978). Critical concepts in Signaling Theory include the signal giver, the receiver, and the signal itself (Connelly et al., 2011). Spence (1978) postulates that signals should be costly for them to be valid characteristics for quality, ensuring that they are not easily imitated by signalers who do not share the same features.

In the context of IPOs, CEOs preparing to go public are the senders who hold private information about themselves, their firm, and their team. They can send signals to investors before the IPO via their public appearances, the prospectus, and during the IPO roadshows. These signals allow investors (the receivers) to base their decisions on a more comprehensive information base (Connelly et al., 2011). Since the JOBS Act in 2012, "emerging growth companies," primarily young and unestablished companies, face lower reporting requirements (e.g., EGCs can submit confidential draft registration statements prolonging disclosing sensitive business information) and thereby can reduce their disclosure costs. This law adjustment led to more IPOs in sectors with high disclosure costs (e.g., biotechnology and pharmaceutical firms) and more IPOs of young companies (Dambra, Field, & Gustafson, 2015). However, lower disclosing requirements are accompanied by increasing information asymmetries between companies and investors. This trend increases the dependence on CEOs' signals, e.g., within roadshows.

Signaling has been of great interest to IPO researchers. Anglin et al. (2018) denote that research in signaling theory focuses not only on costly signals like patents but also on less tangible signals associated with more indirect costs e.g., low cost and costless signals (Anglin et al., 2018a; Chandler, Waddingham, & Wolfe, 2024). These signals are particularly interesting when objective information within an investment context is missing and in the presence of additional uncertainty (Loewenstein et al., 2014). Such

situations include the IPO process, characterized by information asymmetries (Ellis & Michaely, 1999). Investors need to rely on CEO signals, especially when companies are young and have a limited history of financial data. Personality is one example of a low-cost (or cost-less) signal that can play a role in situations where supplementing information is required.

3.2 IPO Success Factors

The process by which a company floats its shares on the stock exchange is lengthy, costly, and fraught with uncertainty for the company and potential investors (Bach, Judge, & Dean, 2008; Ellis & Michaely, 1999). Young companies, particularly, have less objective information available during the initial public offering process (Guo, Lev, & Zhou, 2005; Higgins & Gulati, 2006). Therefore, investors look for signals that reduce the information asymmetry between them and the issuing firms (Higgins & Gulati, 2006; Lester, Certo, Dalton, Dalton, & Cannella, 2006; Wu, 2004). A stream of literature investigates signaling theory (Spence, 1978) within the IPO process (Table 16). Studies focus on patents (Heeley, Matusik, & Jain, 2007), the reputation of the underwriter (Carter & Manaster, 1990), and equity ownership (Downes & Heinkel, 1982). Only a few authors look at the manager or the management team (Cohen & Dean, 2005), revealing the effects of career histories (Higgins & Gulati, 2006), board structure (Certo, Daily, & Dalton, 2001), and management team legitimacy (Cohen & Dean, 2005) on IPO performance. However, the literature is silent on whether Big Five personality traits, especially extraversion, a trait often related to managers, affects IPO success.

Table 16: Signals reducing Information Asymmetries within the IPO Process.

Signal	Reduces information asymmetry by:	Authors (e.g.)
IPO Characteristics		
Retained equity	Higher levels signal the management's confidence in the firm's future.	Beatty & Ritter, 1986; Bruton, Chahine, & Filatotchev, 2009; Daily, Certo, Dalton, & Roengpitya, 2003; Downes & Heinkel, 1982; Kim, Krinsky, & Lee, 1993; Ritter, 1984
Underwriter prestige	Prestigious investment bankers signal less uncertainty due to their experience and fear of losing their reputations. They also face less pressure from firm management and are more likely to uncover unfavorable information than they gain from underpricing.	Beatty & Ritter, 1986; Carter, Dark, & Singh, 1998; Carter & Manaster, 1990; Daily et al., 2003; Feltham, Hughes, & Simunic, 1991; La Rocca, 2021; Lange, Bygrave, Nishimoto, Roedel, & Stock, 2001; Meggison & Weiss, 1991; Michaely & Shaw, 1995; Stuart & Abetti, 1990
Number of uses	As the SEC requires more speculative issues to include the uses of the proceeds in their prospectus, the number of uses can refer to higher uncertainties.	Beatty & Ritter, 1986; Daily et al., 2003; Rasheed, Datta, & Chinta, 1997
Offer price	Low offer prices can signal little demand or value, so there are more significant uncertainties regarding a firm's prospects.	Daily et al., 2003
Lockup period	Companies facing more significant information asymmetries have a more extended lockup period.	Brav & Gompers, 2003; Katti & Phani, 2016
IPO gross proceeds	More significant IPOs are offered by more established firms, reducing perceived risk and uncertainty.	Daily et al., 2003
Firm characteristics		
Firm size	Larger firms present more minor uncertainties due to their access to resources.	Carter et al., 1998; Ibbotson & Ritter, 1995; Meggison & Weiss, 1991
Firm age	Established firms have a long history of published financial data, presenting fewer uncertainties.	Daily et al., 2003; Meggison & Weiss, 1991; Mikkelson, Megan Partch, & Shah, 1997; Ritter, 1998
Venture capital equity	Venture capitalists are interested in the firms' performance and can guide CEOs; therefore, venture capital equity is associated with less uncertainty.	Cyr, Johnson, & Welbourne, 2000; Daily et al., 2003
Patents	Patents (espec. in industries with a strong link between patents and returns) can reduce underpricing.	Heeley et al., 2007
Business group affiliations	Firms affiliated with business groups can benefit from their networks, which can reduce uncertainties.	Katti & Phani, 2016
CEO/Management Team Characteristics		
Career history	Management board members' convincing career histories (prominent companies) can affect investor decisions.	Higgins & Gulati, 2006
Management legitimacy	A new top management team's legitimacy decreases IPO underpricing	Cohen & Dean, 2005
Founder CEO	The presence of a founder CEO increases underpricing due to founder bias and pro entrepreneurship bias.	Certo et al., 2001; Park, Borah, & Kotha, 2016
CEO age	Younger CEOs raise less capital in Malaysian IPOs.	Badru, Zaluki, & Hussin, 2017

CEO social capital	CEOs with higher social capital increase the likelihood of higher underpricing.	Jandik, Jandik, & Xu, 2020
CEO education	Firms led by CEOs with a higher degree and education quality lead to lower levels of IPO underpricing.	Gounopoulos, Loukopoulos, & Loukopoulos, 2021
CEO gender	The gender of the CEO does not affect the underpricing.	Mohan & Chen, 2004
CEO financial expertise	Board members' accounting experience can result in lower underpricing, as they use their knowledge to decrease information asymmetry at the time of the IPO.	Ettredge, Li, Wang, & Xu, 2021
CEO competence, attractiveness, and trustworthiness	CEO perception is associated with IPO pricing (proposed price, offer price, and end of the first day of trading).	Blankespoor et al., 2017
CEO charisma and humility	CEO charisma leads to higher offer prices smaller offer price ranges. Humble CEOs have lower offer prices and broader price ranges	Chandler et al., 2023

3.3 The upper echelons personality:

Hambrick and Mason (1984) initially established the upper echelon theory in the context of organizational adaption. They proposed the idea of an organization as the reflection of its top managers and, thereby, their characteristics. As their managers' cognition and characteristics influence companies' strategies, it is understandable that their sociodemographics play a role (Abatecola, Mandarelli, & Poggesi, 2013). Researchers following this idea tried to relate specific CEO characteristics (e.g., values, motives, psychological factors) to economic outcomes like firm specificness (Abatecola et al., 2013). Within this stream of literature, a unique discourse relates to the CEO's personality. For example, research shows that narcissism (Chatterjee & Hambrick, 2007) or hubris (Li & Tang, 2010) can help understand managers' decision-making behavior. Other authors identify various personality influences on financial success, e.g., within the crowdfunding context (Neuhaus, Isaak, & Bostandzic, 2022).

Our personality forms the basis for every human's decision-making and behavior, from everyday situations to economic choices (McAdams & Pals, 2006; Rauch & Frese, 2014). Therefore, personality covers various forms of intelligence, motives, attitudes,

individual characteristics, and temper (Brandstätter, 2011), forming the foundation for individual differences between humans (Mairnesse et al., 2007). Researchers found that the unique personality develops until the age of 30 and then stays almost stable during the remaining life span (Costa & McCrae, 1988). The most established concept of personality is the "Big Five" model of personality, which scientists developed utilizing a lexical approach (Digman, 1990). They thereby used natural language dictionaries to extract personality attributes reflecting relevant personality characteristics that are both socially relevant and salient (John, 1990). The model consists of five stable traits: openness (e.g., to new experiences), conscientiousness (e.g., dependable, self-disciplined), extraversion (e.g., outgoing. enthusiastic), agreeableness (e.g., sympathetic, warm), and neuroticism (i.e., emotional instability) (Gosling et al., 2003). In the literature, each of the five traits is connected to individual characteristics and influences certain behaviors and outcomes.

Many researchers combined the Five-factor model and the upper-echelon theory to investigate how CEO personality correlates with firm performance and success. They find that firms led by emotionally stable CEOs perform better than companies led by neurotic CEOs (Boone & Brabander, 1993). Other evidence relates firm performance to extroverted and open CEOs (Wijewardena, Nanayakkara, & Zoysa, 2008). Another team of authors finds that extroverted CEOs are associated with, e.g., higher numbers and sizes of acquisitions. Although the CEO's personality, especially the salient trait of extraversion, seems to influence firm performance, its effects on the IPO outcome have not been investigated.

Extraverted people are sociable, optimistic, ambitious, dominant, and excitement-seeking (Bozionelos, 2004; Watson & Clark, 1997). High scores on the extraversion trait

can predict the job performance of managers and salespeople and the likelihood of reaching a leadership role (Barrick & Mount, 1991; Ciavarella et al., 2004; Judge et al., 1999). It contributes to work involvement and impacts the wages employees can command (Almlund et al., 2011; Bozionelos, 2004). Extroverted people need a central position in their working environment to satisfy their strivings (Bozionelos, 2004). Despite this need, extroverted people are good at maintaining contacts, leading to high quantity and quality of social networks (Ciavarella et al., 2004). Studies predict extraversion influences new venture success because a manager's extraversion affects building partnerships with customers and suppliers (Ciavarella et al., 2004). Even though these factors favor a positive influence of extraversion on the funding context, empirical results vary. Whereas some authors highlight the positive social aspects of extraversion, others refer to reward sensitivity, dominance, or impulsivity as critical elements that drive extroverted people (Revelle, 1997).

Not only is the personality important, but so are the aspects displayed in front of others. Especially for young companies that depend on external financing, the entrepreneur or leading manager's personality perceived by the backer, venture capitalists, or business angels is crucial for venture finance and, therefore, firm survival (Murnieks et al., 2015; Neuhaus et al., 2022). Consequently, it should also impact the IPO process, as going public can be one step in a company's journey to becoming an established firm. The IPO process is preceded by a long preparation stage in which the relevant documents are prepared, and a roadshow is held. This stage is characterized by a high involvement of the CEO and the managing team, especially when it comes to the roadshows and the presentation of the companies to potential investors (Ettredge et al., 2021). The demand for company shares and the associated offering price are finalized at the end of this phase.

These variables determine the company's market value at the offering time (Blankespoor et al., 2017). Suppose the roadshow went well, and the CEO presented strong leadership and a striving company. In that case, it will result in favorable company valuations, higher offer prices, and a subsequent high market value. As extraversion is strongly represented in persons who strive in leadership roles, are ambitious, and highly networked, we argue,

H1: *CEO extraversion will be positively related to a company's market value at the initial offering date*[23].

Personality is a construct that remains stable over time (Costa & McCrae, 1988), and extraverted CEOs that accompany their company through a successful IPO will continue to lead a company towards a successful future. In line with the upper echelon theory (Hambrick & Mason, 1984), we argue that the positive effect of extraverted CEOs continues to influence the company's economic success. We therefore expect,

H2: *CEO extraversion will be positively correlated with a company's market value 180 days after the initial offering date.*

An IPO is characterized by information asymmetry and investor uncertainty, which necessitates CEO strength to portray a confident manager who knows what they are doing (i.e., an extroverted CEO). The literature facilitates the underpricing of an IPO (the money left on the table) as an indicator of the uncertainty involved in the public offering process (Daily et al., 2003). CEOs who present themselves as strong leaders before the initial public offering might reduce the perceived uncertainty (e.g., by

[23] Calculated based on the final offer price

investors, underwriting firms and other stakeholder) and mitigate the underpricing. Therefore, we argue:

H3: *CEO extraversion will be negatively correlated with underpricing.*

Since the JOBS Act in April 2012, young companies have been classified as emerging growth companies (EGCs) and face less stringent reporting standards. Further, the shorter history of young companies leads to less observable information (e.g., how a company managed during a crisis) and less historical financial data. This fact additionally reinforces information asymmetries (Barth, Landsman, & Taylor, 2017; Guo et al., 2005) and increases the need for CEOs to signal extraversion and show confidence and strength to lead a young company through an IPO successfully. We therefore argue,

H4*: The reducing effect of extraversion on underpricing will be amplified for young companies.*

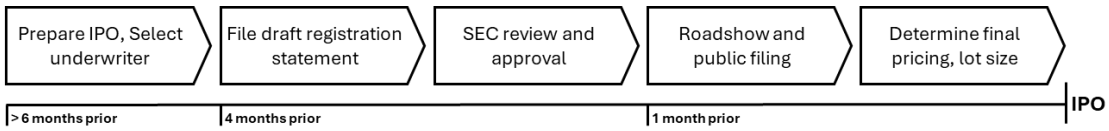
4. Methodology

4.1 Context

If a company decides to go public, it hires a lead underwriter to oversee the entire process—the underwriter assists in preparing relevant documents and legal compliance. The IPO prospectus represents one of these documents and the essential information media during the IPO process (Bhabra & Pettway, 2003). It is compiled by the company's managers and the investment bankers following precise guidelines from the Security and Exchange Commission regarding what information must be disclosed to the public within the prospectus (Welbourne & Cyr, 1999). Both parties are accountable for the correctness of the information provided, ranging from the constitution of the board of directors to the

amount of equity retained by the firm's CEO (Daily et al., 2003). In advance of the IPO, the company organizes roadshows. At these events, the company managers advertise the upcoming IPO to potential investors and evaluate the demand for company shares. This process serves, among other things, to determine an offering price. After the roadshow, the company managers and the underwriter set the initial offering price. At this price, the shares are offered to the initial investors on the first day of trading. The offer price is also used to calculate the first-day change rate. This rate determines whether the company was over or underpriced and how much money was left on the table. A high offer price, a high market value, and low underpricing can be seen as success variables within the IPO process (Certo et al., 2001; Ettredge et al., 2021).

Figure 7: Schematic representation of the IPO process



4.2 Data Collection and Analysis

To test our hypotheses, we first extracted all common stock IPOs of U.S. companies on the U.S. market between January of 2000 and December of 2021 using the Thomson Reuters Eikon Deal Screener (n=3241). We then matched these results to the S1 filings filed at the Security and Exchange Commission (SEC) of the United States of America (n=21937). We identified 1785 IPOs that matched the company name and filing date. We extracted the prospectus for these IPOs to retrieve various information, e.g., the name of the CEO who led the company through the IPO process. Subsequently, we used the Thomson Reuters Eikon Advanced Event Search to collect the complete history of earning calls of all companies within our sample.

E. Essay 4: Show of Strength: Extraverted CEOs and IPO Success in Established and Young Companies

We employed a narrative approach to extract personality variables from spoken language transcripts. Many studies focus mainly on the self-reported personality (Connelly & Hülsheger, 2012; Funder & West, 1993). It is known that the self-assessment of personality is biased by, for example, a highly optimistic view of oneself (e.g., social desirability and impression management) (Falchikov & Boud, 1989; Mabe & West, 1982). To avoid such biases, we applied a method focused on the personality aspects that can be retrieved from spoken language. Therefore, we use the Open Language Chief Executive Personality Tool (OLCPT), developed by Harrison et al. (2019), and rely on CEOs' spoken language. The tool was developed and validated by employing a subsample of S&P 1500 CEOs whose personality traits were previously scored by observers based on video clips (Hill et al., 2019). Within this process, observers rated the CEO's Big Five Personality traits using the 50-item International Personality Item Pool (Goldberg, 1992). Harrison et al. (2019) then employed these scores as indicators of observed CEO personality traits to train linguistic models using open-language machine learning algorithms to identify lexical patterns, subsequently mapping them to the individual big five traits (Park et al., 2015). The mapping process is based on the language used in the company earning calls between CEOs and equity analysts. To employ the stated method, we first manually stripped every earning call document from scripted text like the introduction or presentation part, leaving us only with the Q&A section in which questions not known by the CEOs are answered. We then combined the spoken text by each CEO in our sample within one document, leaving us with 1126 individual text files. Second, we used these files and the R script generously provided by Joseph Harrison to retrieve values on each Big Five Personality Traits.

We test our hypotheses with linear regression (Wooldridge, 2013), which facilitates the interpretation of our results and provides us with an actual r-square value for our models. Our dependent variables are the market value at the offer date, 180 days after the initial offering, and the IPO's underpricing (Blankespoor et al., 2017; Ettredge et al., 2021; Gounopoulos et al., 2021). For the given sample, they are non-normal according to a Shapiro-Wilk test (p<.001; z = 18.669; p<.001; z = 18.353; p<.001; z = 18.486) and characterized by heteroskedastic errors according to a Breusch-Pagan test (p=.084; χ^2 = 2.99; p<.001; χ^2 = 13.45; p<.077; χ^2 = 3.12); therefore, in line with previous literature, we use the log-transformed variable (Blankespoor et al., 2017; Block et al., 2018; Chan & Parhankangas, 2017; Lukkarinen et al., 2016) and report robust standard errors in our models.

4.3 Variables

4.3.1 Dependent Variables

Market Value. We use the market value at the offer date and 180 days after the initial offer as a success variable instead of the often-used offer price (Grinblatt & Hwang, 1989). The market value is preferable to the offer price because offer prices are unstable and often cluster around a certain amount, resulting in little explanatory power (Blankespoor et al., 2017).

Underpricing. IPO Underpricing describes the difference between the initial offer price and the first day's closing price (Daily et al., 2003; Ritter, 1998). Within the literature, IPO underpricing is often used to indicate information asymmetries between the IPO firm and potential investors (Beatty and Ritter, 1986). Therefore, signals that reduce the investor's uncertainty should also lessen the underpricing. In our sample, we calculate the underpricing as the percentage change between the initial offer price and the

first day's closing price given by the Thomson Reuters Database. Within the calculation, we use a log(x+1) transformation.

4.3.2 Independent Variable

The variable extraversion describes the CEO's score for extraversion, which is plotted on a scale from one to seven. To retrieve this score, we used the combined earning call Q&A sections of CEOs and the Open Language Chief Executive Personality Tool (OLCPT) (Harrison et al., 2019).

4.3.3 Control Variables

We include several control variables in our calculation. We address the company age to control the reduced uncertainty investors associate with established companies (e.g., Blankespoor et al., 2017; Carter et al., 1998). We include the lockup period as companies facing higher uncertainties are connected to more extended lockup periods (e.g., Brav & Gompers, 2003). We address several CEO-specific variables to control, e.g., their education (e.g., Gounopoulos et al., 2021). Additional used controls, as well as dependent and independent variables, are listed in Table 17.

Table 17: Description of Variables.

Variables	Description	Authors (e.g.)
IPO specific variables		
Market Value Offer Date (ln) [a]	Log transformed market value of equity calculated with the final offer price.	Blankespoor et al., 2017
Market Value 180 Days (ln) [a]	Log transformed market value of equity calculated with the share price 180 days after the initial offer.	
Filing Year [a]	Year of the filing date (earliest date on which the registration of the offering was first filed)	
Underpricing (ln) [a]	Percentage change between the firm's first-day closing price per share and the offer price	Blankespoor et al., 2017; Ettredge et al., 2021; Gounopoulos et al., 2021
Dual [b]	Dummy variable for multiple share class IPOs	(Loughran & Ritter, 2002)
Price/Book[a]	Price/Book Value After Offer: Price is the price per share offered to the public, and book value is common equity after the offer divided by shares outstanding.	
Lookup Period	The minimum number of days shares must be held before lockup agreements and/or restricted periods expire.	
Firm-specific variables		
Industry[c]	SIC Division	Blankespoor et al., 2017
RoA[a]	Return on Assets: Net income after taxes / Assets.	
Young Company [b]	Dummy variable: 1 if the years between the firm's founding date and its IPO date are smaller/equal to 10	Blankespoor et al., 2017; Certo et al., 2001; Ettredge et al., 2021; Meggison & Weiss, 1991
Internet [b]	The dummy variable equals one if the company is internet-based.	(Loughran & Ritter, 2002)
Venture Capital (V.C.)b	V.C. is a dummy with the value 1 for V.C. and the value 2 for a subset of V.C. (growth capital)	Blankespoor et al., 2017; Certo et al., 2001; Ettredge et al., 2021; Loughran & Ritter, 2002; Meggison & Weiss, 1991
CEO specific variables		
Extraversion	Extraversion score (1-7) of the aggregated earning call transcripts via Open Language Chief Executive Personality Tool	Harrison et al. 2019
CEO Founder[c]	Dummy variable, 1 if the company's founder is CEO at the time of the IPO	Blankespoor et al., 2017; Bruton et al., 2009; Ettredge et al., 2021; Gounopoulos et al., 2021
CEO University[c]	The dummy variable equals 1 if the CEO has visited a university or holds an MBA, bachelor's, or master's degree.	Blankespoor et al., 2017; Gounopoulos et al., 2021
CEO Dissertation	The dummy variable equals 1 if the CEO has made a Ph.D., M.D., J.D., or holds the title Dr.	

[a]Thomson Reuters Eikon; [b]Ritter Databases, [c]SEC S1 Prospectus

5. Results

Our dataset includes IPOs filed via S-1 at the U.S. Security and Exchange Commission (SEC) between 2000 and 2021. The IPOs span nine SIC divisions and have a mean market value of *M*=814,500,000 USD (*SD*=2,213,000,000). Of the 850 companies in the regression models, 444 are ten or younger (mean age: *M*=22.22 years, *SD*=17.78), and 488 have venture capital backing at the IPO. 25,9% of the CEOs leading their companies through the IPO process are their founders. A third of the CEOs visited a university in our sample, and 19,4% hold a Dr., Ph.D., M.D., or J.D. The documents used to generate personality scores for every CEO in our sample include the Q&A sections of several earning calls. Therefore, we analyze an average of *M*=5233,01 (*SD*=1436,31) spoken words per CEO. Further descriptive statistics can be found in Table 18.

Table 18: Summary Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
RoA	852	3.724	17.307	0	418.317
Market Value (Offer Date)	852	814,500,000	2,213,000,000	32956119	49,500,000,000
Market Value (180Days)	852	918,100,000	2,368,000,000	0	46,650,000,000
Underpricing	765	.168	.273	-.9	2.116
Lockup	852	178.62	23.008	45	365
Company Age	852	17.776	22.22	1	165
Agreeableness	852	4.163	.825	1.56	6.179
Conscientiousness	852	5.125	.519	1	6.413
Extraversion	852	4.725	.851	1	6.815
Neuroticism	852	3.188	.637	1.29	5.943
Openness	852	4.741	.579	2.273	6.556

Next, we describe our regression results based on Tables 19 and 20. Table 19 focuses on the dependent variable market value at the offer date and 180 days after the initial offer. Models 1 and 4 show the effects of the control variables, while models 2 and 5 show the main effect of the Big Five personality trait extraversion, and models 3 and 6 show the combination thereof. Table 20 shows the effects of the dependent variable

underpricing. In this table, model 1 shows the effects of the control variables, model 2 includes the main effect, and model 3 a combination thereof. Model 4 consists of the interactions of extraversion with the dummy variable young company.

Table 19: OLS Models of Extraversion in Earning Calls with Industry Fixed Effects, DV: Market Value (ln) Offer Date/180 Days.

	(1) Offer Date	(2) Offer Date	(3) Offer Date	(4) 180 Days	(5) 180 Days	(6) 180 Days
Filing Year	.026***		.027***	.034***		.032***
	(.006)		(.007)	(.008)		(.009)
Price/Book	.001***		.002***	.002***		.003***
	(0)		(.001)	(0)		(.001)
RoA	0		-.002*	.002		0
	(.001)		(.001)	(.002)		(.001)
V.C.	-.148**		-.268***	-.142*		-.295***
	(.061)		(.071)	(.077)		(.09)
Internet	.102		.086	.007		.038
	(.096)		(.101)	(.079)		(.09)
Dual	.56**		.504*	.072		-.005
	(.229)		(.272)	(.282)		(.369)
Young Com.	-.228***		-.253***	-.282***		-.29***
	(.064)		(.071)	(.08)		(.089)
CEO Uni.	-.015		-.001	.008		.005
	(.069)		(.076)	(.085)		(.09)
CEO Dis.	-.188**		-.126	-.183*		-.133
	(.079)		(.087)	(.101)		(.112)
CEO Founder	-.063		-.044	.023		.083
	(.065)		(.071)	(.084)		(.088)
Lockup	-.002**		-.003	-.004***		-.004*
	(.001)		(.002)	(.001)		(.002)
Extraversion		.139***	.122***		.161***	.149***
		(.042)	(.043)		(.051)	(.051)
Fixed Effects	yes	yes	yes	yes	yes	yes
_cons	-32.081***	19.223***	-33.45**	-48.497***	19.228***	-44.804***
	(11.267)	(.2)	(13.405)	(15.509)	(.243)	(17.339)
Observations	1108	921	852	990	833	788
R-squared	.115	.066	.147	.115	.061	.135
F-stat	7.373	11.099	6.79	6.823	10.129	7.657
RMSE	.953	.965	.922	1.117	1.107	1.064
Logl.	-1509.022	-1269.018	-1128.769	-1504.131	-1261.823	-1156.19

Robust standard errors are in parentheses.
*** p<.01, ** p<.05, * p<.1*

Table 20: OLS Models of Extraversion in Earning Calls with Industry Fixed Effects, DV: Underpricing (ln).

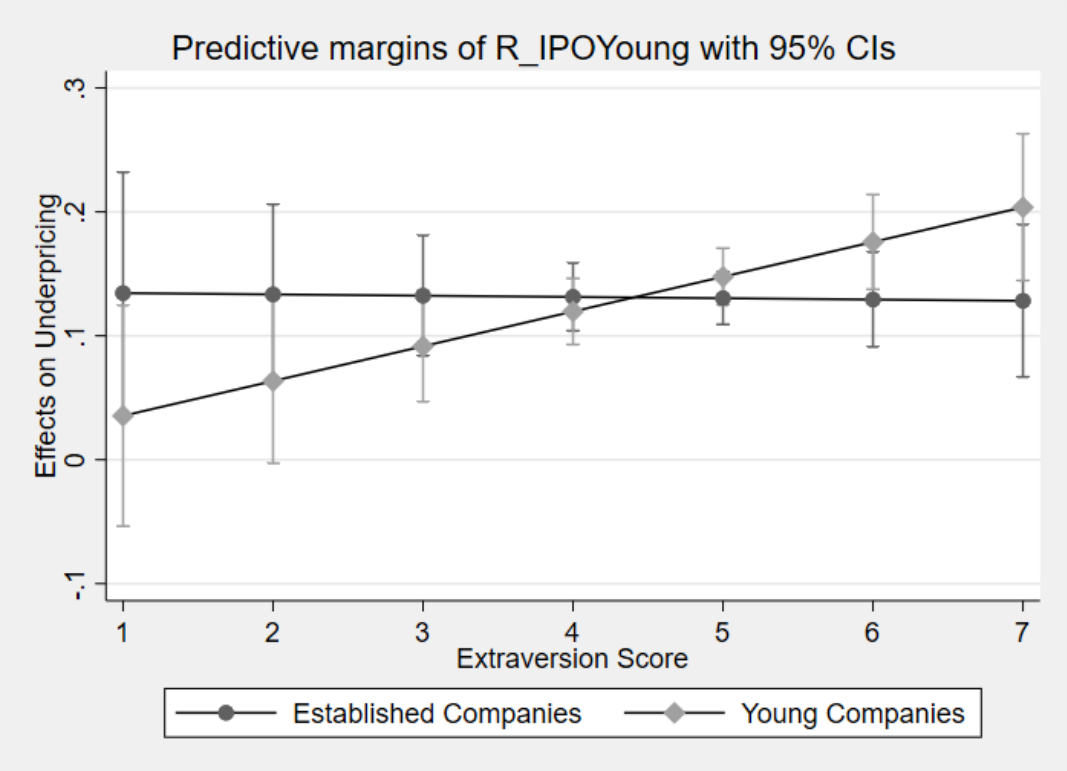
	(1) Underpricing	(2) Underpricing	(3) Underpricing	(4) Underpricing
Filing Year	.003**		.004**	.004***
	(.001)		(.002)	(.002)
Price/Book	0***		0***	0**
	(0)		(0)	(0)
RoA	.001***		.001**	.001**
	(0)		(0)	(0)
V.C.	.024*		.022	.022
	(.013)		(.015)	(.015)
Internet	.015		.012	.013
	(.017)		(.014)	(.013)
Dual	-.011		-.03	-.03
	(.034)		(.042)	(.042)
Young Com.	.023		.01	-.128
	(.015)		(.016)	(.078)
CEO Uni.	-.004		.001	.001
	(.015)		(.017)	(.017)
CEO Dis.	-.002		.001	.004
	(.019)		(.022)	(.022)
CEO Founder	.027*		.032*	.031*
	(.015)		(.018)	(.018)
Lockup	0		0	0
	(0)		(0)	(0)
Extraversion		.022**	.016*	-.001
		(.009)	(.009)	(.013)
Young Com. # Extraversion				.029*
				(.017)
Fixed Effects	yes	yes	yes	yes
_cons	-5.957**	.034	-7.696**	-8.355***
	(2.679)	(.043)	(3.091)	(3.18)
Observations	953	818	763	763
R-squared	.064	.038	.073	.076
F-stat	4.216	5.824	3.415	3.236
RMSE	.2	.197	.196	.196
Logl.	192.926	171.292	170.819	172.327

Robust standard errors are in parentheses.
**** p<.01, ** p<.05, * p<.1*

We interpret the results for Hypotheses 1 and 2 based on models 3 and 6 of Table 19, which explains 14,7 and 13,5 percent of the variation in funding success (R^2=.147 and .135) and shows the controls and the main effect of extraversion on our dependent variable (log. market value). First, we find that the coefficient of extraversion on the market value at the offer date is positive and significant (β=.122, p=.004), in line with our prediction in H1. Second, extraversion still positively affects the market value 180 days after the initial offering (β=.149, p=.004), as predicted in our H2.

The results for Hypotheses 3 and 4 are displayed in Table 20. We interpret them based on models 3 and 4. First, we find that the coefficient of extraversion on underpricing is weakly positive significant (β=.016, p=.096), contrary to our prediction in H3. Similarly, the interaction between the variable young company and extraversion is weakly positively significant (β=029, p=.08), again in a direction not predicted by our H4. The association between high underpricing and highly extraverted CEOs strengthens for young companies. Figure 8 illustrates the predictive margins for these interactions with 95% confidence intervals to understand this effect better. Extraversion's impact on underpricing differs for established and young companies.

Figure 8: Interactions between Extraversion & Established and Young Companies.



Among our control variables, we find that IPO-specific variables play a role. There are significant positive effects on the filing year (offer date: β=.034, p<.001; 180

days: β=.032, p<.001) and the price per book value (offer date: β=.002, p=.003; 180 days: β=.003, p<.001). In addition, the company-specific variables venture capital backing (offer date: β=-.268, p<.001; 180 days: β=-.295, p=.001) and young company (offer date: β=-.253, p<.001; 180 days: β=-.29, p=.001) negatively affect the market value of a company. When it comes to underpricing, we find significant effects of the control variables filing year (β=.004, p=.013), price per book value (β=.000, p=.009), and return on assets (β=.001, p=.011).

5.1 Robustness Test and Endogeneity

Past research has shown that personality differs between genders. Although there are only minor gender differences for the trait extraversion, there are differences on the facet level, with males scoring higher in assertiveness and excitement seeking (Weisberg, Deyoung, & Hirsh, 2011). Also, men tend to be more dominant and overconfident. Many studies focusing on corporate managers limit their sample to male CEOs, and they do so because of the small number of female CEOs in the researched environment. In our sample, 29 female CEOs face 823 male CEOs. We repeated the calculated regressions with only a male sample to ensure this imbalance did not affect our results. The results show similar effects across all dependent variables.

One concern regarding our results might be the issue of endogeneity. As we study displayed CEO personality traits and their effect on IPO performance, extraverted CEOs tend to choose companies with, e.g., higher risks involved. These could lead to higher market values and underpricing at IPOs regardless of the CEO leading the company. While we cannot rule out this concern, we argue in line with authors employing similar study designs that the study findings are not primarily driven by endogeneity (Kaplan, Klebanov, & Sorensen, 2012; Timphus, Bostandzic, Irresberger, Tietze, &

Weiss, 2023). Further, our research focuses on the personality displayed by CEOs via spoken language, a measure that highlights the extraversion others (e.g., investors) perceive while engaging with the CEO rather than the internal personality trait. However, in further developing this paper, the concern will be met with additional company control variables (see, e.g., Malmendier & Tate, 2005).

6 Discussion

First, our results suggest a strong influence of the CEO's extraversion on the market value of companies after their initial offering. These results imply that extraverted CEOs can negotiate higher offer prices and establish favorable company valuations. This argumentation aligns with the research that describes extraverted people as dominant and ambitious (Bozionelos, 2004; Watson & Clark, 1997). Furthermore, researchers have demonstrated a clear link between extraversion, overconfidence, and self-promoting tactics (Kristof-Brown et al., 2002; Schaefer et al., 2004), which can also lead to a higher market value due to negotiated offer prices. Another aspect could be the ability of extraverted CEOs to maintain a high quantity and quality of networks (Ciavarella et al., 2004), as these can come in handy while striking favorable deals.

Second, in line with our H2, the CEO's extraversion continues to influence a firm's market value after the public offering. Therefore, we can still see significant positive effects of the CEO's extraversion on the company's market value half a year after the IPO. This result suggests that CEOs' personalities influence the company's fate far beyond the IPO process. Indeed, researchers have discovered that extraversion influences the CEO's general economic behavior, e.g., strategic risk-taking or strategic change management (Benischke, Martin, & Glaser, 2019; Herrmann & Nadkarni, 2014).

Third, the CEO's extraversion reflected in unscripted spoken language positively affects underpricing. Against our initial hypothesis, our results show that extraverted CEOs face higher underpricing during the IPO process. Several authors argue that higher underpricing indicates information asymmetry between the issuing firm and the investors (Daily et al., 2003). Following this line of argument, CEOs who appear extraverted increase investors' uncertainty, leading to higher amounts of money left on the table for the issuing firms. Our results on extraversion might lead in the direction of literature on the darker side of the personality trait extraversion. Researchers uncovered that extraversion is connected to narcissism, overconfidence, and impulsivity (Creek et al., 2019; Lee & Ashton, 2005; Miller, 2015; Revelle, 1997; Schaefer et al., 2004). In the context of traded assets, researchers showed that high extraversion expressions of CEOs increase their firms' stock risk (Harrison et al., 2020). Further, researchers found that extraverted CEOs are associated with a firm's expected costs of capital, perceived risk, and lower credit rankings (Adebambo, Bowen, Malhotra, & Zhu, 2024; Harrison et al., 2020). Studies even revealed that extraverted CEOs had a negative effect on their company's performance during the financial crisis (Liao, Nguyen, & Truong, 2023). Therefore, CEOs' extraversion is a warning flag for investors who want to avoid losses and are interested in solid and sure returns.

Fourth, we find a significant interaction between extraversion and the company's age regarding underpricing. Against our initial theory, young companies do not profit from extraverted CEOs. On the contrary, CEOs of young companies that score high on extraversion lead to higher underpricing. As higher underpricing indicates information asymmetry (Daily et al., 2003), combining extraverted CEOs and young companies increases the uncertainty surrounding a public offering.

6.1 Limitations

Our study also has several limitations. First, although we plan to collect several control variables, the setup does not allow for the collection of all relevant data. It is challenging to capture characteristics expressed in situational contexts (Epstein, 1979) or scores usually generated via psychological questionnaires. The CEOs' I.Q. cannot be measured by spoken language or prospectus text, even though it has predictive power (Almlund et al., 2011). Future research could integrate measures of I.Q. in the IPO context and even highlight the interaction with personality signals.

Second, in our sample, the gender balance is not ideal. This imbalance is because female CEOs undertaking an IPO as the leading managers are far less than male CEOs. Therefore, the personality signals they display might have a greater or lesser influence on their financing success, e.g., because investors face more uncertainties as there is less historical evidence on female CEOs. We encourage every scientist working in this research area to use a female sample to validate our findings across gender.

Third, our sample is limited to S-1 SEC filings and U.S. companies going public in the United States of America. Further research can build on our work by comparing our findings to IPOs in different countries or foreign IPOs in the U.S. market. Given our data, results should be most comparable in English-speaking realms, e.g., Australia, New Zealand, Singapore, and the United Kingdom. Nonetheless, a cross-cultural comparison could be interesting.

Fourth, we do not measure the personality of CEOs directly but instead use constructs that result from linguistic algorithms based on narratives (see also Fast & Funder, 2008). Hence, we aim to capture CEO extraversion as investor signals. Further, our chosen method is also advantageous because it facilitates big data and artificial

intelligence approaches and avoids bias from human coding or self-report personality measures. Nevertheless, other authors could consider comparing alternate operationalization of extraversion with our results.

6.2 Contributions and Implications

We investigate our research question through the lens of Signaling and Upper Echelon theory. These theories allow us to adapt the concept of personality to the context of initial public offerings and make several contributions to the literature.

First, by examining the effects of extraversion in the context of IPOs, our findings contribute to the research on which personality traits are helpful for CEOs in obtaining capital (e.g., Mitteness et al., 2012; Moritz et al., 2015b; Murnieks et al., 2015). We broaden the field of application and show that personality signals affect IPO success differently depending on a company's age.

Second, this study extends the broader literature on the relationship between managerial success and personality. Therefore, it provides new input to a central debate on the impact of individual-level components on company performance and outcomes like acquiring financial capital (e.g., by going public).

Third, our study focuses on the Open Language Chief Executive Personality Tool (OLCPT) (Harrison et al., 2019) to predict the effects of extraversion on financial success. This approach has not been used before in the context of IPOs to the best of our knowledge. In this way, our results can help us better understand IPO investors' motives and the drivers for their funding decisions.

Our study also has practical implications. First, our results can help CEOs who plan to take their company public to focus on signaling certain personality traits or refrain from appearing too extraverted to raise their chances of (financial) success. Second,

companies that plan to go public increase their self-awareness regarding the communicated personality signals and optimize their message to potential investors.

F. Overreaching Conclusion and Contribution

1. Conclusion

The studies conducted and included in this dissertation consistently concentrate on young companies and entrepreneurs, a research area that is of particular interest as the dynamics in this area are significant in several respects. Young companies face challenges acquiring early-stage venture capital and increasingly exploit alternative financing methods like crowdfunding. Crowdfunding offers a less regulated way to raise capital than traditional funding instruments, allowing entrepreneurs to acquire customers and validate their business models or ideas at an early stage while maintaining a high degree of independence from individual investors (Cumming et al., 2019b; Junge, Laursen, & Nielsen, 2022). This shift towards alternative financing methods reflects broader changes in the entrepreneurial landscape, as traditional barriers to entry are lowered and entrepreneurs can increasingly leverage their personal networks and social media platforms to secure funding (Borst et al., 2018).

In this distinctive context, the information asymmetry is high as young firms have limited (financial) data, and the regulations (e.g., disclosing standards) are lower. Therefore, investors have limited information on top of being already less experienced. The need for signals beside the available facts is high. Entrepreneurs sending signals about their firm's quality, their suitability as an entrepreneur, their experience, and their personality is crucial to pursuing potential investors and securing needed funding (Agrawal et al., 2014; Anglin et al., 2020).

Knowing more about the influence of personality signals in an investing context can serve as valuable insight for the entrepreneurial community. Young companies can, for example, benefit from their entrepreneur's display of certain advantaged personality traits. Further, investors can reduce the information asymmetry faced in an investment

context by integrating personality assessments of entrepreneurs and executives as part of their evaluations. Such considerations might mitigate the threat of moral hazard. Although a far stretch, one can imagine that even Elisabeth Holmes's deception regarding her young company Theranos would have been seen through if investors had included personality factors in their assessments and taken traits such as conscientiousness or the harmful facets of extraversion into careful consideration.

Tapping into that field, the four papers in this dissertation collectively provide a comprehensive exploration of the intersection between displayed personality traits and entrepreneurial success, particularly in the context of (equity) crowdfunding and IPOs.

They reveal (1) a substantial need for further studies well described in the current literature. This need clusters around the following three categories:

a. Nonlinear relationships between expressed personality traits and successful crowdfunding.
b. Varying methods like qualitative or mixed methods approaches.
c. Replication studies in similar and differing contexts to ensure the stability of results and influence of context variables.

They further show that (2) the Big Five personality traits displayed by the entrepreneur via crowdfunding campaign text and video (AI-based extraction) impact the financial success of an equity crowdfunding campaign. Particularly, higher conscientiousness, lower neuroticism, extraversion, and surprisingly lower openness impact the outcome in terms of capital raised within a campaign. Further, the information volume of a given campaign amplifies the negative effect of perceived neuroticism on funding success.

Changing the method of personality measurement to observer ratings, we find that (3) entrepreneurs rated high on openness, conscientiousness, extraversion, and agreeableness and low on neuroticism, positively influence the rater's investment intention. Interestingly, the data also shows that openness and conscientiousness, as rated by the observers, have predictive power for the actual investment amount raised within the equity crowdfunding campaign. The data suggests that naïve observers' personality ratings and investment intentions might be a proxy for actual investor behavior and investment decisions within the crowdfunding market.

Finally, by transferring the context from equity crowdfunding to IPOs and focusing on the Big Five personality trait extraversion, we can demonstrate that (4) expressed CEO extraversion affects a company's market value and underpricing. While extraverted CEOs correlate with a higher market value, they also seem to inflict higher underpricing, which means "money left on the table". Further, the last effect is heightened for young companies.

2. Contribution

Together, the studies underscore the importance of the Big Five personality traits, especially openness, extraversion, and conscientiousness, in attracting investors and securing funding, especially for young firms. They further highlight the gaps in the literature and the need for further investigations in the area. Joined in their results, the studies also tell a story about (1) the interlocking of different methods, (2) the context dependency of personality signals effects, and (3) the newness of the presented research, the respective gaps in the literature and need for future research regarding personality in the investment context that contributes to literature, methodology, and practice.

(1) This dissertation uses several measures of the Big Five personality traits. They reach from naïve observer ratings based on questionnaires (TIPI-G) to narrative approaches like (IBM personality insights and OLCPT), which all lead to significant results within the studies (Harrison et al., 2019). They further rely on different sources to identify entrepreneur and CEO personality traits. Assessing videos, crowdfunding campaign pages, and earning calls, we generated valid personality measures that led to comparable results. This dissertation shows that the personality of entrepreneurs and CEOs is displayed in various forms and perceived by observers and investors as it influences outcomes. The articles each, thereby, contribute to the methodology that is even surpassed by their collective significance.

(2) The literature review reveals varying effects of entrepreneurs' personality traits on crowdfunding success. The two studies on equity crowdfunding success within this dissertation underline the context dependency of personality signals. For example, the effects of certain traits shift in their significance and even direction between the dependent variables of investment intention and actual investment success. Our results show that a specific personality trait has a different effect depending on the context. If we take, for example, extraversion, many papers agree on a positive effect on reward-based crowdfunding success (Gera & Kaur, 2018; Rottler et al., 2020; Thies, Wessel, Rudolph, & Benlian, 2016b) where no monetary returns are involved. Our paper shows that this effect remains the same if we look at the investment intention of naïve observers outside a real investment context. However, if we look at actual investments, the effects shift, and extraversion becomes a trait negatively affecting the amount

raised within an equity crowdfunding campaign. We further find this effect in the context of IPOs where CEO extraversion increases underpricing. Integrating these different contexts within this dissertation allows for a holistic view. It becomes clear that, for example, financial benefits and involvement influence the perception of advantageous personality traits. The positively perceived outgoing, ambitious, and engaging founder in a reward-based crowdfunding setting becomes the negatively perceived overconfident and self-promoting entrepreneur/CEO in the context of equity crowdfunding and IPOs. These results contribute not only to the research in entrepreneurship but also to the practice. They can provide founders with valuable guidance to optimize their approach situationally. The awareness that certain displayed personality traits, such as conscientiousness, can help in a context involving financing a company and acquiring venture capital is invaluable. It is essential to recognize that the beneficial traits in an investing context may differ from those relevant in the early stages of founding and promoting a specific idea. This knowledge represents a crucial competitive advantage for young companies and entrepreneurs.

(3) To our knowledge, the studies included in this dissertation combine several firsts. The literature review was the first review on personality factors and crowdfunding success. Furthermore, our study on displayed personality in equity crowdfunding was the first quantitative study focusing on the Big Five traits of entrepreneurs in the context of equity crowdfunding. The third article was the first to bridge investment intention in a non-financial context with actual investments in equity crowdfunding campaigns. Finally, the depiction of the

proximity of personality effects (extraversion) between equity crowdfunding and IPOs is also very novel for this research field. While contributing to the literature, this also demonstrates that further research on the effects of personality in the alternative finance market (e.g., crowdfunding) is needed. Only with further research is it possible to work out how the alternative finance market can be contextualized within the traditional market and how they relate to personality signals and financing success.

This collection of four articles sheds light on the underexplored aspect of an entrepreneur's/CEO's personality effects on venture financing, thereby helping entrepreneurs and young companies to navigate their way through the complex and challenging everyday life of venture financing as well as give investors in the alternative financial market some guidance to better assess the displayed personality of entrepreneurs and protect themselves from unexpected surprises.

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H. Appendix

A.1 Appendix Essay 2

Figure 9: Example Video Text and the Corresponding IBM Personality Insights Output

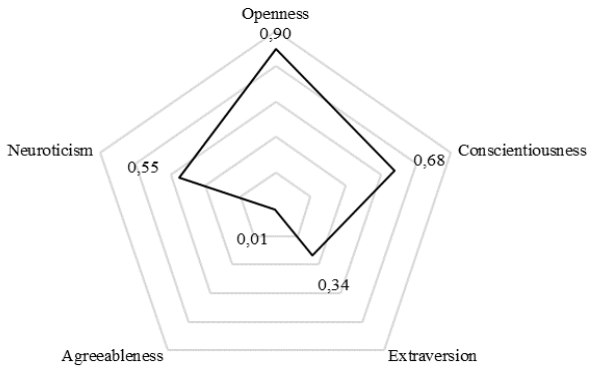
Input (excerpt only)	Output
Hi, I'm Dr. Natan Jauvis, founder and Chief Scientist at Monday Motorbikes. At Monday Motorbikes, we make the world's most stylish electric motorbike for urban transportation, perfect for aspiring two-wheel riders. As a motorcycle rider, I set out to solve my own challenges of commuting in a city where public transit and parking was unreliable and time consuming. I engineered and designed an electric motorbike inspired by the café racers and mopeds of the 1960s & 70s. I made sure, to integrate advanced technology features such as regenerative bracing, Bluetooth connectivity and patented removable batteries. 6 generations and 7 years later, I am proud to introduce the Monday Motorbikes' M1[…]	

Table 21: Summary Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Funding (USD)	697	248310.52	328040.70	0.00	2493054.00
Number of Investors	697	430.920	764.373	0	8551
Openness (VHPT)	697	0.883	0.141	0.008	0.998
Conscientiousness (VHPT)	697	0.744	0.112	0.321	0.977
Extraversion (VHPT)	697	0.640	0.186	0.033	0.976
Agreeableness (VHPT)	697	0.102	0.088	0.001	0.590
Neuroticism (VHPT)	697	0.138	0.197	0.000	1.000
Word count (VHPT)	697	6088.220	3595.204	736	36528
Number of comments	697	39.120	80.970	0	1334
Number of updates	697	12.450	14.834	0	187
Number of pictures	697	41.306	25.274	0	200
Multiple visible speakers	697	0.273	0.446	0	1
Video duration (seconds)	697	123.761	127.763	0	1736
Number of employees	697	6.482	13.525	1	225
Established company (>5 years)	697	0.184	0.387	0.	1
Campaign Duration (days)	697	89.015	49.023	0	463

Descriptive statistics are based on the initial data set. VHPT=Video and homepage text

Table 22: Correlation Table and Variance Inflation Factors

Variables	VIF	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(1) Funding (ln)		1.0000																					
(2) Investors (ln)	1.70	0.8693*	1.0000																				
(3) Openness	2.31	0.0053	-0.0460	1.0000																			
(4) Conscientiousness	1.44	0.1493*	0.1300*	0.3769*	1.0000																		
(5) Extraversion	1.79	-0.0196	-0.0479	0.4928*	0.2765*	1.0000																	
(6) Agreeableness	1.34	0.0410	0.0799*	-0.2227*	0.2158*	0.1076*	1.0000																
(7) Neuroticism	2.43	-0.0688	-0.0329	-0.6505*	-0.3581*	-0.5664*	0.1274*	1.0000															
(8) Word count	1.88	0.3198*	0.2535*	0.2363*	0.2189*	0.0007	-0.0444	-0.1754*	1.0000														
(9) Comments (ln)	2.10	0.4063*	0.2836*	0.0210	0.0453	-0.0581	-0.0696	-0.0225	0.3220*	1.0000													
(10) Updates (ln)	1.50	0.2649*	0.2685*	0.0477	0.1726*	-0.0056	0.1299*	-0.0490	0.5009*	0.2791*	1.0000												
(11) Picture count	1.32	0.1806*	0.0873*	-0.0100	0.0496	-0.0359	0.0096	0.0236	0.3801*	0.3299*	0.1958*	1.0000											
(12) Multiple visible speakers	1.14	0.1064*	0.0967*	0.1060*	0.0855*	0.1261*	0.0921*	-0.0211	0.0062	-0.0046	0.0036	0.0874*	1.0000										
(13) Video duration (sec)	1.23	0.1908*	0.1622*	0.2346*	0.1497*	0.1329*	0.0245	-0.2110*	0.2220*	0.0712	0.0965*	0.0556	0.2408*	1.0000									
(14) Project size	1.30	0.3952*	0.4047*	0.0432	0.1011*	0.0153	0.0068	-0.0346	0.1262*	-0.0060	0.1126*	0.0525	0.0040	0.1260*	1.0000								
(15) Project category	1.12	0.0680	0.1250*	-0.1485*	-0.1293*	-0.1086*	-0.0177	0.1837*	-0.0974*	-0.0694	-0.0459	-0.0607	-0.0156	-0.0152	0.0543	1.0000							
(16) Security type	1.40	0.2161*	0.2548*	0.1706*	0.0648	0.1865*	0.0070	-0.2288*	0.0596	-0.1593*	0.0068	-0.1129*	0.0519	0.1096*	0.2365*	-0.0260	1.0000						
(17) Number of employees	1.09	0.1626*	0.0870*	-0.0149	-0.0105	0.0544	0.0381	-0.0450	0.0850*	0.0924*	0.0024	0.0502	-0.0153	0.0412	0.0911*	-0.0084	-0.0681	1.0000					
(18) Jurisdiction	1.39	0.0646	0.0259	0.3816*	0.2246*	0.2491*	-0.0975*	-0.3943*	0.1834*	0.0480	0.0488	-0.0406	-0.0040	0.1601*	-0.0013	-0.1636*	0.1876*	-0.0175	1.0000				
(19) Established company	1.07	0.0823*	0.0227	0.0846*	0.0417	0.0937*	-0.0717	-0.0762*	0.0711	0.0619	0.0314	0.0920*	0.0164	0.0301	-0.0304	-0.0511	-0.0014	0.1289*	0.0458	1.0000			
(20) Year	1.18	0.1132*	0.1807*	-0.0049	0.0168	0.0411	0.0168	-0.0349	0.0298	-0.1391*	0.0599	-0.1283*	0.0247	0.0246	0.2038*	-0.0743*	0.2243*	0.0654	0.0497	0.0853*	1.0000		
(21) Campaign duration	1.05	0.0517	0.0717	-0.0119	0.0129	0.0479	0.0452	0.0001	0.0018	-0.0891*	0.0350	-0.0801*	-0.0455	-0.0203	0.0863*	0.0577	0.0443	-0.0223	0.0241	0.0136	0.1853*	1.0000	
(22) Platform	2.71	0.1783*	0.0194	0.4804*	0.1560*	0.3538*	-0.1845*	-0.5248*	0.3146*	0.4736*	0.0568	0.1085*	0.0151	0.2436*	-0.0174	-0.1936*	0.1966*	0.0682	0.4308*	0.1083*	-0.0015	-0.0412	1.0000

** Denotes a significant correlation at the p<.05 level*

A.2 Appendix Essay 3

A.2.1 Personality Questionnaire

Please start the video and watch it carefully.

Please try to pay particular attention to the founder/CEO shown in the video or the founder/CEO shown in the video.

You can watch the video only once.

[Video Player about here]

Do you know the person shown?

Yes	No
o	o

Here are a number of personality traits that may or may not apply to the person(s) shown. Please indicate the extent to which it does or does not apply to the observed person(s). You should rate the extent to which the pair of traits (extroverted, enthusiastic) applies to the observed person(s), even if one characteristic applies more strongly than the other.

Please try to make your assessment primarily for the founder/manager shown in the video.

I see the person observed in the video as[24]:

	Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
Extraverted, enthusiastic.	o	o	o	o	o	o	o
Critical, quarrelsome.	o	o	o	o	o	o	o
Dependable, self-disciplined.	o	o	o	o	o	o	o
Anxious, easily upset.	o	o	o	o	o	o	o
Open to new experiences, complex.	o	o	o	o	o	o	o
Reserved, quiet.	o	o	o	o	o	o	o
Sympathetic, warm.	o	o	o	o	o	o	o
Disorganized, careless.	o	o	o	o	o	o	o
Calm, emotionally stable.	o	o	o	o	o	o	o
Conventional, uncreative.	o	o	o	o	o	o	o

Would you invest? [25]

Imagine you wanted to invest in a young company, how likely would you be to invest in the company from the video?

Definitely not 0%  100% Definitely

How do you rate the quality of the video?

Please rate the quality as independently as possible from your assessment of the personality or the given investment probability.

	low						high
Video quality	o	o	o	o	o	o	o

[24] Questionnaire-based on the Ten-Item-Personality-Inventory Gosling, Rentfrow, & Swann, 2003, the actual survey used the validated german TIPI-G version Muck, Hell, & Gosling, 2007.
[25] Scale inspired by Cumming, Hervé, Manthé, & Schwienbacher, 2020.

A.2.2 Additional table

Table 23: Correlation table.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Total Funding (ln)	1.000																				
(2) Total investors (ln)	0.900*	1.000																			
(3) Investment Intention	0.160*	0.125*	1.000																		
(4) Openness	0.100*	0.103*	0.399*	1.000																	
(5) Agreeableness	0.024	0.030	0.331*	0.378*	1.000																
(6) Conscientiousness	0.145*	0.132*	0.426*	0.377*	0.407*	1.000															
(7) Extraversion	0.068*	0.052	0.190*	0.484*	0.053	0.147*	1.000														
(8) Neuroticism	-0.112*	-0.095*	-0.363*	-0.363*	-0.283*	-0.436*	-0.357*	1.000													
(9) Word Count	0.398*	0.429*	0.018	0.011	-0.074*	0.038	0.009	-0.059*	1.000												
(10) No. of Updates (ln)	0.202*	0.232*	-0.044	-0.046	0.006	0.042	-0.043	-0.005	0.387*	1.000											
(11) No. of Comments	0.388*	0.466*	0.002	-0.028	-0.014	0.084*	-0.067*	0.018	0.431*	0.563*	1.000										
(12) Project Category	0.302*	0.338*	0.012	0.002	-0.064*	-0.014	0.079*	-0.056	0.036	-0.081*	0.114*	1.000									
(13) No. of Employees	0.186*	0.140*	0.078*	0.053	0.031	0.028	0.055	-0.081*	0.075*	-0.154*	0.028	-0.011	1.000								
(14) Project Size	0.566*	0.474*	0.029	0.033	-0.029	0.116*	0.115*	-0.099*	0.188*	0.028	0.036	0.209*	0.121*	1.000							
(15) No. of Pictures	0.211*	0.198*	0.017	0.018	0.005	0.017	0.074*	-0.050	0.371*	0.242*	0.347*	0.049	0.113*	0.100*	1.000						
(16) Multiple Speakers	-0.132*	-0.160*	-0.017	0.044	0.015	-0.023	0.038	0.001	-0.211*	-0.125*	-0.099*	-0.151*	0.087*	-0.105*	0.032	1.000					
(17) Video Duration	-0.033	-0.031	-0.059*	-0.041	-0.082*	-0.131*	-0.070*	0.068*	-0.022	-0.085*	-0.249*	0.011	0.082*	-0.088*	-0.207*	0.098*	1.000				
(18) Video Quality	0.232*	0.188*	0.504*	0.409*	0.258*	0.420*	0.281*	-0.317*	0.027	0.006	-0.031	0.047	0.107*	0.164*	0.074*	0.048	-0.114*	1.000			
(19) Campaign Duration	-0.035	-0.013	-0.007	0.065*	-0.053	-0.042	0.117*	0.012	0.051	-0.151*	-0.052	0.171*	0.046	-0.004	0.018	-0.077*	0.035	-0.045	1.000		
(20) Platform	0.200*	0.177*	0.092*	0.076*	0.049	0.011	0.113*	-0.049	0.036	-0.423*	-0.557*	0.185*	0.007	0.237*	-0.180*	-0.122*	0.149*	0.160*	0.010	1.000	
(21) Security Type	0.071*	0.066*	0.028	-0.001	-0.003	0.042	0.108*	0.001	0.101*	-0.072*	-0.015	0.092*	-0.099*	0.023	-0.009	0.047	0.086*	0.034	-0.025	0.270*	1.000

* *p<0.05*

Table 24: Poisson regression models (DV: total investors).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Video quality	.075***	.058***	.059***	.081***	.072***	.074***	.054***
	(0)	(.004)	(.004)	(0)	(0)	(0)	(.01)
Mult. visible	-.324***	-.33***	-.319***	-.318***	-.322***	-.325***	-.317***
speakers	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Video duration	0	0	0	0	0	0	0
	(.693)	(.67)	(.794)	(.656)	(.733)	(.698)	(.619)
Project size	.391***	.39***	.385***	.396***	.394***	.391***	.393***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Project category	.036***	.036***	.037***	.037***	.037***	.036***	.037***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
# of employees	.023***	.023***	.023***	.023***	.023***	.023***	.023***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Established	-.089	-.087	-.089	-.089	-.091	-.089	-.085
company	(.158)	(.165)	(.154)	(.154)	(.149)	(.159)	(.166)
Female founder	-.103	-.108	-.099	-.102	-.109	-.1	-.101
	(.174)	(.156)	(.194)	(.181)	(.154)	(.191)	(.195)
b.ethnicity[26]	-1.53***	-1.553***	-1.539***	-1.512***	-1.529***	-1.531***	-1.533***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
h.ethnicity	-.579**	-.602***	-.563**	-.56**	-.574**	-.579**	-.566**
	(.012)	(.009)	(.014)	(.015)	(.013)	(.012)	(.012)
w.ethnicity	-.674***	-.671***	-.674***	-.674***	-.671***	-.673***	-.672***
	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Innovativeness	.223***	.23***	.226***	.216***	.217***	.225***	.225***
	(.001)	(.001)	(.001)	(.002)	(.002)	(.001)	(.001)
Part. age	-.003	-.004	-.003	-.003	-.003	-.003	-.003
	(.614)	(.535)	(.57)	(.661)	(.612)	(.608)	(.562)
Part. gender	.025	.005	.008	.037	.021	.024	.013
	(.668)	(.931)	(.896)	(.536)	(.724)	(.689)	(.826)
Part. education	-.031	-.032	-.031	-.031	-.03	-.032	-.032
	(.472)	(.462)	(.48)	(.478)	(.49)	(.469)	(.461)
Openness		.06**					.085***
		(.021)					(.006)
Conscientiousness			.06**				.049
			(.041)				(.139)
Extraversion				-.029			-.06**
				(.22)			(.031)
Agreeableness					.021		-.022
					(.417)		(.434)
Neuroticism						-.007	.009
						(.799)	(.768)
Observations	1170	1170	1170	1170	1170	1170	1170
R-squared	.358	.361	.36	.359	.358	.358	.366
F-stat	43.819	41.839	40.774	41.33	41.858	41.204	33.808
RMSE	.982	.98	.98	.982	.982	.982	.978
logl.	-1630.155	-1627.157	-1627.76	-1629.279	-1629.829	-1630.126	-1622.54

p-values in parentheses, Constant included but not shown, clustered standard errors specified
**** p<.01, ** p<.05, * p<.1*

[26] Ethnicities: African American, Hispanic, Caucasian and Asian (base group)

A.2.3 Third-Party Ratings of Investment Intention

Table 25: Participants Ratings based on Factors Focusing on the Crowdfunder

Focus Topic and Sample Quotes by Rating Participants (Answers to the Question: How did you determine the probability with which you would invest?)	Observations (n)
Trust and Credibility *"First, how much trust I would place in this person and their words (credibility and trustworthiness)." //* *"Based on trustworthy impression of the founders […]."*	20
Competence *"By the charisma and competence of the people" //* *"The competency and knowledge of the subject […]."*	32
Sympathy *"To what extent […] person representing [the company] seems sincere and likeable to me." // "So I thought about how sympathetic I found the persons."*	18
Gut Feeling *"Gut feeling, [I decide] at least not in a relational way, [...]." //* *"From the impression, based on intuition."*	14
Convincing Entrepreneur *"[…] how convincing the founders were." //* *"The founder(s) also play an important role, of course, if no other information is available."*	5
Success Prospects *"First and foremost, whether there is a market for it. Then, how the competition is/could be in the market. How scalable the business model was (or the possibility of franchise)." //* *"According to how many evidence I have that the business model could be successful […]."*	36
Innovativeness of Entrepreneur and Idea *"Innovation, originality, usability." //* *"Depending on how practical and useful I find the idea […]."*	45
Backer Interest *"Personal interest in the topics has definitely been included." //* *"Whether the company appealed to me with its philosophy."*	31

Statements of single participants can be included in several focus topics.
**Translated to English by the Authors*

I. Affidavit

Heinrich Heine
Universität Düsseldorf

Eidesstattliche Versicherung

Ich, Frau Julia Neuhaus, versichere an Eides statt, dass die vorliegende Dissertation von mir selbstständig und ohne unzulässige fremde Hilfe unter Beachtung der „Grundsätze zur Sicherung guter wissenschaftlicher Praxis an der Heinrich-Heine-Universität Düsseldorf“ erstellt worden ist.

Düsseldorf, den 24. Mai 2024

Unterschrift