

An Analysis of the Relationship Between Sustainability Focus and Grit in German Entrepreneurs



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Abstract The purpose of this study is to delve into the personalities and the values that make up German entrepreneurs. The rising awareness regarding sustainability issues and the wish to counteract them led to the creation of what is known as sustainable entrepreneurship. This type of entrepreneurship tries to solve current sustainability issues through market innovation. With this said, the objective of this study is to find whether a relationship exists between an entrepreneur's sustainability orientation and the existence of sustainable entrepreneurship. Additionally, it sets out to see how a psychological concept like grit, meaning the Perseverance of Effort and Consistency of Interest over a long period of time, influences the relationship between them. To analyze these relationships, the three topics were viewed through the lens of literature review, especially focusing on the perspective offered through the Triple Bottom Line. Moreover, empirical research was conducted by using a questionnaire that had 29 German respondents, defining themselves as entrepreneurs. The results indicate that sustainability orientation is an antecedent for sustainable entrepreneurship. However, a positive relationship between sustainability orientation and grit could not be detected. Therefore, it was found that grit does not play a mediating role between the independent variable (sustainability orientation) and the dependent variable (sustainable entrepreneurship). Moreover, this study highlights the importance of psychological research into the personality of entrepreneurs to foster entrepreneurial action in the future. The second valuable area being the implementation of sustainable behavior into the economy and personal life, benefitting the individual's state of mind, as well as society.

Keywords Grit · Sustainable entrepreneurship · Sustainability focus

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1 Introduction

How do successful people do it? If the readers of this article are anything like its author, they have asked themselves this very question. What differentiates successful people from unsuccessful ones, and how can one strive to be successful in their own right? This is where the psychological concept of grit creates the basis for understanding the personality of those that have achieved their goals. Contrary to popular belief, it is not talent that drives them, but rather a combination of perseverance and resilience, combined with hope, which defines Angela Duckworth's concept of grit (Duckworth & Quinn, 2009). Generally, character traits found in high achievers are defined by a strong interest in their respective field, the desire to reach a high level of achievement, as well as the preparedness to put significant amounts of effort and time into the journey of reaching one's goal (Duckworth et al., 2007).

Moreover, the changing economic landscape in Germany highlights the role entrepreneurs and their startups have as drivers of economic innovation. This provides the basis for this research to find out what drives entrepreneurs, what their personalities look like, and how their personal interests shape and influence the face of their companies.

No matter how entrepreneurs' competencies are defined in detail, research overwhelmingly agrees that entrepreneurial competencies detrimentally impact the business's future success. However, they are not natural occurrences in an entrepreneur's character, but they rather are acquired and developed through experience and by accessing similar competencies by business partners and others (Busenitz & Barney, 1997; Mitchelmore & Rowley, 2008, 2013; Rasmussen et al., 2011). All these findings bring to light a theoretical connection between entrepreneurs and the concept of grit.

Due to the rise in awareness regarding environmental degradation and the interest in preserving life for future generations, shown in the economic, societal, and environmental areas, a change in the way of thinking in terms of these issues is detected; not only in the minds of consumers but also in those of business actors and policymakers. Therefore, a rise in the want and need of implementing sustainability in an organization has been observable. Moreover, the concept of sustainability incorporates challenging conventional practices and thinking in terms of long-, as well as short-term well-being. Additionally, it incorporates an analysis of the core issues when making decisions, while recognizing the connection and interdependencies within the field. Furthermore, it is defined as an open-ended process, though confined through limitations, but also infinite opportunities for creative innovation. It is found within a context of complexity and unpredictable situations, where safety measures are paramount while recognizing crossovers in means and ends in terms of culture, governance, ecology, society, as well as economy (Elliot, 2013; Scoones, 2007). In terms of *sustainability dimensions*, Seghezze (2009) builds upon the dimensions of *Economy, Environment, and Society*, which traditionally are represented within the concept of the *Triple Bottom Line*, which will be viewed as the basis for this research.

Consequently, this research sets out to analyze the relationship between an individual's affinity toward sustainability and the occurrence of sustainable entrepreneurship. It is of interest to find out if grit plays an important role in this relationship, and whether it positively influences sustainable entrepreneurship (SE). This body of work wants to fill the literary gap between sustainability orientation, entrepreneurship, and grit, as well as provide implications for the research on entrepreneurs' personalities. Furthermore, it highlights the importance of the malleable nature of one's personality. Additionally, it emphasizes the importance of combining current topics, like sustainability, with new emerging markets.

2 Literature-Based Hypotheses Development

An entrepreneur's impact on the performance of their organization is widely acknowledged, for instance, by Mitchelmore and Rowley (2008). Therefore, it is crucial to understand their behavior to, in turn, predict the organizational behavior, which incorporates the entrepreneur's values into the company culture. Regarding sustainable development, the implementation of sustainability by a company is believed to lead to long-term success, for example, by Gawel (2012). Her study argues that an entrepreneur's sustainability focus facilitates sustainable organizational behavior. Thus, it is hypothesized that:

H1. There is a positive relationship between sustainability focus and sustainable entrepreneurship.

Grit literature illustrates that being gritty is part of one's personality, ergo influenced by values and norms held by the individual. In this context, the character development model by Sweeney and Fry (2012) illustrates how values and beliefs are internalized to form one's identity. Therefore, the Perseverance of Effort and Consistency of Interest within grit are believed to be higher for areas that incorporate an individual's values and beliefs. This research argues that entrepreneurs need to find their frame of possibilities to use their impact to solve current sustainability issues. This led to the assumption that grit influences the occurrence of sustainable entrepreneurship, stemming from a sustainability orientation since entrepreneurs can realize their personal values and beliefs in their own company. Therefore, this study hypothesizes the following:

H2. The relationship between sustainability focus and sustainable entrepreneurship is mediated by grit.

The research framework has been illustrated in Appendix A.

3 Establishment of Entrepreneurs' Demographic Profile Through Data Collection

The quantitative methodology used primary data, which was collected by using a structured questionnaire, where the target population for the study was German entrepreneurs. The European Startup Monitor analyzes the entrepreneurial landscape in Germany in its 2016 country report (ESM, 2016). These statistics were used as a basis for the questions asked to generate the demographic profile. The sample was chosen with the convenience sampling technique making the result ungeneralizable. However, this technique was believed to be suitable due to the nature and context of the study, meaning SE. Furthermore, due to this research analyzing the status of SE in Germany, this sampling technique was also deemed suitable. Moreover, the respondents were chosen based on having founded a business, which they were still leading. It was not tested whether the respondents are entrepreneurs based on a certain scale, but the study relies on the respondents' self-definition as entrepreneurs. The respondents were selected through personal recommendations, LinkedIn, and a university newsletter in the field of entrepreneurship. The study generated a total of 29 respondents, of which one was deemed invalid regarding the open question "What industry is your company in?" but was retained due to the other answers being satisfactory. In the beginning, Microsoft Excel was used for dataset analysis to evaluate the entrepreneurs' general profiles and the company's profile. Later, the program as well as SPSS was used for hypothesis testing. Regarding the entrepreneurs' profiles, 48.3% were younger than 30 years old, 24.1% were 30–40 years old, and 27.6% were older than 40. Most of the respondents stated to be male (62.1%), 34.5% were female, and 3.4% identified as other. Moreover, more than half (55.2%) attained an Undergraduate or Graduate degree, 34.4% had less than an Undergraduate degree, and 10.3% stated their highest educational achievement to be higher than a Graduate degree. In relation to the company profiles, the given answers on the company's industry were adjusted to portray representative categories. The top represented industry was Retail (24.1%), and the second was identified to be Marketing (20.7%). Moreover, 24.1% of the companies exist for less than two years, 20.7% exist for two to three years, and the majority (55.2%) have been in existence for more than three years. Most of the companies have less than ten employees (62.1%), 27.6% have more than 20, and only 10.3% have ten to 20 employees, including the founders. Regarding the average annual turnover, the majority (48.3%) reported having less than 250,000 EUR, and 27.6% stated to generate more than 1,000,000 EUR, closely followed by companies earning between 250,000 EUR and 1,000,000 (24.1%). Lastly, most respondents (75.9%) stated to have founded less than two companies, 13.8% said to have founded two or three companies, and 10.3% responded to have founded more than three companies in the past (Appendix B).

4 Measurement Through Questionnaire and Higher Order Construct Formation

The questionnaire consists of 30 items measured using a five-point Likert scale, anchored from 1(= strongly disagree) to 5(= strongly agree), except for the grit scale which was anchored from 1(= not at all like me) to 5(= very much like me). Sustainability focus was measured by also adopting the items of Hooi et al. (2016), who named it *sustainability orientation*, where they adopted the six-item scale from Kuckertz and Wagner (2010). The respondents' grit levels were measured by adopting the ten-item scale from Duckworth (2017), where five items measured the Consistency of Interest, and the Perseverance of Effort was measured by the other five items of the scale. Each of the dimensions of SE were measured by items adopted from Hooi et al. (2016). Fifteen items measured SE, constructing the *Triple Bottom Line*, the researchers adopted four items for the economic impact from Ahmad and Seet (2009). Additionally, seven items were taken for measuring society impact. Lastly, four items to measure the environmental impact are all taken from Turker (2009). The variables' internal consistency was deemed to be satisfactory. The Cronbach's alpha was calculated before adjustment and shall be used as a first assessment of the variables' internal consistency. Since the scales concerning SE were adapted from Hooi et al. (2016) without making any changes to them, the following remains to be true: "sustainable entrepreneurship has been modelled to be a higher order formative construct, formed by the three first-order constructs, namely, economic, environment and society" (p. 1625). Regarding the second-order reflective construct grit, it was modeled with two first-order reflective constructs (Consistency of Interest and Perseverance of Effort).

5 How Are Sustainability Focus, Grit, and Sustainable Entrepreneurship Related?—Data Analysis Results

Regarding the assessment of the respondents' grit levels, the method suggested by Duckworth (2017) was used. Hereby, the points given for each question (ranging from 1 to 5) are added together and are subsequently divided by ten. Therefore, a result of 5 would suggest an extremely high level of grit, whereas the lowest possible score of 1 suggests the opposite. Moreover, a score of 4.1 puts the respondent into the 70% percentile, meaning that the individual is grittier than 70% of the adults in the given sample. The results of this survey were compared to a sample of American adults. Within the given sample a large range of grit scores was detected, ranging from 2.9 (18% percentile) to 4.8 (97% percentile). Significantly, a higher frequency of responses was detected regarding the grit scores of 3.2 (4 respondents), 3.5 (6 respondents), and 3.9 (5 respondents). In other words, entrepreneurs are grittier than 26.5% (grit score 3.2), 40% (grit score 3.5), and 60% (grit score 3.9) of American adults, respectively. However, it was found that, on average, German entrepreneurs

have an average grit score of 3.6, suggesting that they are, on average, grittier than roughly 44% of American adults (Appendix C). Moreover, it could be assumed that grit levels in older people would be higher compared to those of younger people. However, this could not be seen in the given sample, due to the range of grit scores being 3.2 (lowest) to 4.8 (highest) in the age category “Older than 40” (indicated by the number 3 on the y-axis). Again, the highest possible grit score is 5, and the lowest is 1 (Duckworth, 2017). Therefore, the theory of grit growing with age through life experience, as suggested by Duckworth et al. (2007), was not supported among the surveyed German entrepreneurs (Appendix D).

In terms of the analysis of the measurement model, for this study, the convergent and discriminant validity of the measurement model were tested, where Khan et al. (2016) provide the reasoning for doing so. To adequately assess the convergent validity, the following was pursued. For reflective scale measurement the convergent validity, factor loading, composite reliability (CR), and average variance extracted (AVE) were measured, with reference to Rahman et al. (2015). For this study, the factor loading cut-off value was set at 0.5, as suggested by Hair et al. (2010), which led to the exclusion of nine items: SF 4 and SF 6 (Sustainability focus); CI 2 (Consistency of Interest); PE 1, PE 2, and PE 5 (Perseverance of Effort); EC 4 (Economic); as well as SC 4 and SC 6 (Society). Moreover, the convergent reliability was deemed satisfactory, based on its range between 0.764 and 0.930 being above 0.7, with reference to Hair et al. (2010). The higher-order construct grit, a reflective second-order factor is represented by seven first-order items with reflective scale measurement, whereas the higher-order construct sustainable entrepreneurship is a formative second-order factor, represented by twelve first-order items, also with reflective scale measurement. Regarding the first, the CR was not calculated since it was not needed for the assessment of the discriminant validity later. However, in this context, the CR scores of the first-order constructs Consistency of Interest (CI) and Perseverance of interest (PI) are satisfactory. Generally, Hair et al. (2013) suggest that composite reliability shall be considered instead of Cronbach's Alpha, which is why this study adopted this approach. The latent variables' AVE, where Hair et al. (2010) recommended a level of 0.5, was deemed satisfactory since it ranged from 0.544 to 0.675. Regarding the formative scale measurement, and as suggested by Hair et al. (2011), the p-value and t-value were assessed to show whether the indicators have a significant effect on the latent variable, in this case, sustainable entrepreneurship. To run the analysis, a bootstrapping procedure for multiple regression was used with 2000 resamples, with reference to Yu (2002). For the confidence interval function in SPSS, the Bias Corrected accelerated (BCa) was used as a more accurate approach to estimating the 95% confidence interval level, as suggested by Fox (2008). Additionally, the variance inflation factor (VIF), showing the multicollinearity of the indicators, was examined to assess the convergent validity. Moreover, VIF values should be below 3.33, with reference to Diamantopoulos and Siguaw (2006), which they are. Even though, only the Economic results show a p-value of <0.01 , Environment and Social, were retained due to the VIF meeting the requirement, as done by Hooi et al. (2016). Therefore, the convergent validity regarding the formative scale measurement is fulfilled (Appendix E). After analyzing the convergent validity, the discriminant validity regarding the

reflective scale measurements was conducted. To confirm the discriminant validity, the Fornell-Larcker Criterion was adopted, regarding which the squared root of each latent variable's AVE is supposed to be higher than the correlations of the other latent constructs with reference to Fornell and Larcker (1981). The results show that the discriminant validity for the three given constructs (sustainability focus, grit, and sustainable entrepreneurship) can be deemed satisfactory. Summarizing these findings, it can be said that both convergent and discriminant validity for this study are adequate (Appendix F). Regarding the structural model, it is analyzed based on the path coefficient and value of R^2 to measure its predictive power, with reference to Rahman et al. (2015). Furthermore, a Sobel test was conducted for testing the mediating relationship in the model, with reference to Sobel (1982).

5.1 Analysis of the Direct Relationship Between Sustainability Focus and Sustainable Entrepreneurship

Sustainability focus was found to be positively correlated with sustainable entrepreneurship with a β -value of 0.551 ($p < 0.01$), consequently, leading to H1 being supported. This result suggests that an entrepreneur's individual sustainability focus favors undertaking the creation of sustainable entrepreneurship. These findings support remarks made by Haldar (2019), stating that for *ecopreneurship* and sustainable entrepreneurship to occur, sustainability orientation and/or personal motivation are required as internal factors to enable SE. Moreover, the R^2 of sustainable entrepreneurship was 0.303, meaning that 30.3% of the variance can be explained by sustainability focus, more specifically by its Environment, Economic, and Social dimension. Based on guidelines by Cohen (1988) on interpreting the R^2 , the value of sustainable entrepreneurship is substantial.

5.2 Analysis of the Mediating Relationship Through Grit

To analyze the mediation relationship within the model, a bivariate regression analysis was conducted between the independent variable sustainability focus and the mediator grit. It was revealed that the direct effect between the two was statistically unsatisfactory, with a significance value of -0.475 . For the sake of completeness, the analysis was carried out completely. Consequently, a multiple regression analysis with sustainability focus and grit as predictors and sustainable entrepreneurship as the dependent variable was conducted to estimate the effect between sustainability focus and sustainable entrepreneurship ($\beta = 0.710$, standard error = 0.246), and, additionally between grit and sustainable entrepreneurship ($\beta = -0.255$, standard error = 0.353). To further estimate and test the indirect effect for statistical significance a Sobel test was conducted, as mentioned previously. Unsurprisingly,

the β -value (-0.701) and significance level of 0.257 ($p > 0.01$) were insufficient. Thus, H2 was rejected. These results of the study indicate that grit is not a mediating factor between sustainability focus and sustainable entrepreneurship, and a positive relationship between sustainability focus and grit cannot be identified (Appendix G).

6 Discussion

The goal of this research was to analyze the relationship between sustainability focus and sustainable entrepreneurship, as well as see whether a possible presence of a mediating role of grit between the two could be detected. The findings of the empirical study imply that sustainability focus is an antecedent for sustainable entrepreneurship. Thus, supporting the statement made by Ploum et al. (2018), finding that pro-environmental behavior values are antecedents for being able to identify opportunities for sustainable development. Additionally, what it also suggests is that an entrepreneur's personal values and beliefs influence how they shape their ventures, with reference to Gawel (2012). Consequently, the assumption that an individual that advocates for sustainability in their private life does so as well in their professional life, can be made. Since the mediation analysis was not significant, the empirical study's results do not show that entrepreneurs are generally grittier than American adults. As previously stated, the entrepreneurs in this sample might be, for instance, in the 60% percentile, meaning that they are grittier than 60% of the American adults in the given sample. However, they might also be grittier than just 26.5%, among other scores. These fluctuations may be accountable to grit scores being highly individual, as suggested by Duckworth (2017), meaning that the higher or lower grit level is not attributed to the fact that the respondents are entrepreneurs, but rather to other factors making up their personality in the moment of questioning. Future research should take into consideration a larger sample size to prove or disprove the assumption that entrepreneurs are, on average, grittier than other adults. Furthermore, the results of this research cannot identify a positive relationship between sustainability focus and grit. This is perhaps due to two factors. First, the grit scores among German entrepreneurs are significantly lower than expected, compared to American adults. Based on other publications, for instance by Duckworth et al. (2007), grit correlates with personality traits associated with entrepreneurs, namely conscientiousness. Thus, it was assumed that entrepreneurs generally exhibit higher grit levels than the average adult, but this was not reflected in the sample. Regarding the demographic profile of the sample, an indicator for the lower grit scores is the fact that 75.9% founded fewer than two companies. However, this might also be due to 48.3% of the respondents being less than 30 years old. Nonetheless, the companies owned by the respondents can be considered small, since 48.3% generate less than EUR 250,000 on average, and 62.1% have less than ten employees. In conclusion, a sample of entrepreneurs with higher grit levels and economically more successful companies, i.e., average revenue above EUR 250,000, might lead to the positive relationship between sustainability focus and grit, which should be the focus of future

research. The suggestion that this might already be achieved by having a bigger sample size leading to a higher average grit score can be made, based on the variance in grit scores in the smaller sample. Secondly, respondents were chosen based on their self-assessment of being entrepreneurs, which was not measured statistically. Therefore, there might perhaps be a questionable relationship between entrepreneurship and sustainable entrepreneurship because it is not clear if respondents would be classified as entrepreneurs, based on scales adopted, for instance, by Cardon et al. (2012). In other words, if the respondents were not defined as entrepreneurs, based on the literature, this could be the reason for lower grit levels than expected. Additionally, sustainable entrepreneurship could then not occur, since entrepreneurship is considered its antecedent, with reference to Hooi et al. (2016). In the context of the German entrepreneurial landscape, the European Startup Monitor finds that 66.2% of the startup founders advocate for social engagement, and 57.4% of those value economically sustainable development of the business (ESM, 2016). Therefore, a trend towards sustainable entrepreneurship was already detected in 2016 and is assumed to become stronger in the next years. Thus, German entrepreneurs will benefit from developing a sustainability focus to adapt to current market changes. Those market changes are represented in the changing mindset of consumers as well, where, especially in Germany, businesses receive an advantage when positioning themselves as sustainably responsible, with reference to Maignan (2001). Moreover, given the long-term nature of sustainability, it is assumed that it will provide the business with a long-term advantage, since life is sustained for future generations, opening doors to future revenue generation. Grit is developable, with reference to Duckworth (2017), and in the context of this research, the level of displaying Consistency of Interest and Perseverance of Effort cannot be too high. Therefore, entrepreneurs would also benefit from consciously developing their grit level, which is assumed to positively correlate with the success of the venture, with reference to Butz et al. (2018). Since sustainability entrepreneurship focuses on personal skill and initiative, it is clear why it provides the starting point for societal change. In other words, entrepreneurs are needed to develop environmental and/or social innovations to achieve market success, and subsequently, societal change toward a more sustainable future for all.

7 Limitations

There are two major limitations to the current research. Generally, this study relied on a self-report questionnaire, for which the limitations are well known, with reference to, for example, Paulhus (1991). Consequently, the study relied on the respondents' self-assessment of being entrepreneurs and might not theoretically be classified as such. Therefore, the need to restructure the model by changing the variables was identified to correctly assess if respondents can theoretically be categorized as entrepreneurs as well. It is proposed to set the independent variable as

entrepreneurship, and consequently, have two dependent variables, namely sustainable entrepreneurship, and grit, with the mediator still being sustainability focus, leading to two new hypotheses with a mediation role of sustainability focus. Lastly, the sample size of 29 may be considered too small, therefore, this research should be redone with a bigger sample size to get a more accurate result. A sample size of 200 is suggested, with reference to Hair et al. (2010) (Appendix H).

8 Conclusion

Entrepreneurs have always been drivers of innovation by providing the market with solutions to existing problems. One of those problems, with increasing importance in recent years, has been the issue of sustainability. Sustainable entrepreneurial action can bridge the wish for economic success and innovative ecological problem-solving. The importance of sustainability, embodied in personal goals and preferences by the entrepreneur, is thus reflected in the venture's goals and objectives. Therefore, the company is influenced by the entrepreneur's personality, which is supported by the empirical research finding, that sustainability orientation acts as an antecedent for sustainable entrepreneurship. Since the entrepreneur's personality (made up of a moral code, values, norms, etc.) detrimentally influences the company they found, it led to the inclusion of the third dimension of grit into this body of work. To answer the question, "How do successful people do it?" posed in the very beginning, it can be said that it comes down to their personality and their willingness and readiness to work on achieving a goal over a long period of time. In other words, they view success as a marathon, not a sprint, and do not give up, even when disappointed. Moreover, generally, a high level of grit has been found to correlate with entrepreneurial behavior, which led to the assumption that a high level of grit would enhance the level of sustainable entrepreneurship, especially in those with a pre-existing sustainability focus. Against the previous assumption, this sample of entrepreneurs was, on average, grittier than just 44% of American adults. Additionally, no positive relationship between sustainability focus and grit could be detected. However, the notion that grit acts as a mediator between the two variables should not be discredited, due to this sample size being too small. Moreover, an adjusted framework could prove that respondents truly are entrepreneurs. Therefore, this study should be redone according to the new framework with a larger sample size to better test the hypotheses. Additionally, another focus of future research could be the lack of previous literature on the question of whether gender generally influences grit levels, which was not part of this research due to the limited space provided. Practically, this research has shown the importance of sustainability and personality research in the entrepreneurial field. Regarding grit and its practical implication, personality is the antecedent for entrepreneurial action. Thus, highlighting the importance of parental figures and educators fostering grit in young people. Moreover, this would benefit the economy in the long term by raising entrepreneurs who will solve future issues through innovative solutions. On another note, sustainability should be supported by a change in environmental policies to

provide access to chances for future entrepreneurs. The establishment and changing of existing companies hold a wide range of opportunities for economic pressure on legislation to change regulations and for economic success. But most importantly, pro-environmental behavior leads to personally perceived happiness, with reference to Corral-Verdugo et al. (2011), leading the way to collective happiness for society, while in turn, benefitting our environment for future generations to come.

Appendix A

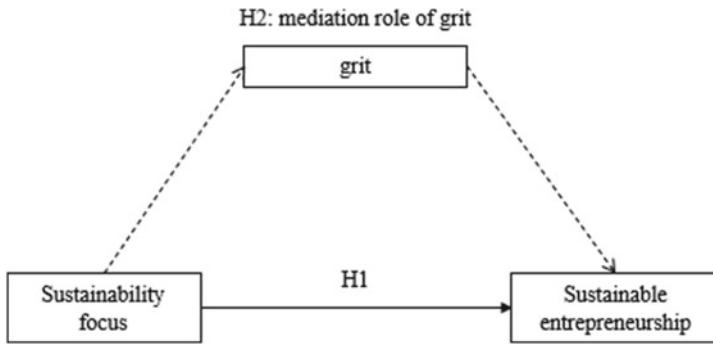


Fig. A.1 Proposed framework

Appendix B

Table B.1 Demographic profile (adapted from Hooi et al., 2016)

Demographic variable	Category	Frequency	(%)
Age	Younger than 30	14	48.3
	30–40 years old	7	24.1
	Older than 40	8	27.6
Gender	Female	10	34.5
	Male	18	62.1
	Other	1	3.4

(continued)

Table B.1 (continued)

Demographic variable	Category	Frequency	(%)
Education	Less than Undergraduate degree (Bachelor)	10	34.5
	Undergraduate degree (Bachelor) or Graduate degree (Master)	16	55.2
	Higher than Graduate degree	3	10.3
Industry (adjusted)	Consulting	2	6.9
	Education	1	3.45
	Engineering	2	6.9
	Event	1	3.45
	Finance	3	10.3
	Food & Beverage	2	6.9
	Marketing	6	20.7
	Pharma	1	3.5
	Retail	7	24.1
	Sport	1	3.45
	Technology	1	3.45
	Transport	1	3.45
	Invalid	1	3.45
	Age of company (years of establishment)	Less than 2 years	7
2–3 years		6	20.7
More than 3 years		16	55.2
Number of full-time employees	Less than 10 employees	18	62.1
	10–20 employees	3	10.3
	More than 20 employees	8	27.6
Average annual turnover	Less than 250,000 EUR	14	48.3
	250,000–1,000,000 EUR	7	24.1
	More than 1,000,000 EUR	8	27.6
Number of startups founded	Less than 2 companies	22	75.9
	2 or 3 companies	4	13.8
	More than 3 companies	3	10.3

Appendix C

Table C.1 Summarized grit scores

	Grit score	Percentile (%)	Frequency
Lowest	2.9	18	1
	3.2	26.5	4
	3.5	40	6
	3.9	60	5
Highest	4.8	97	1
Average	3.6	44	

Appendix D

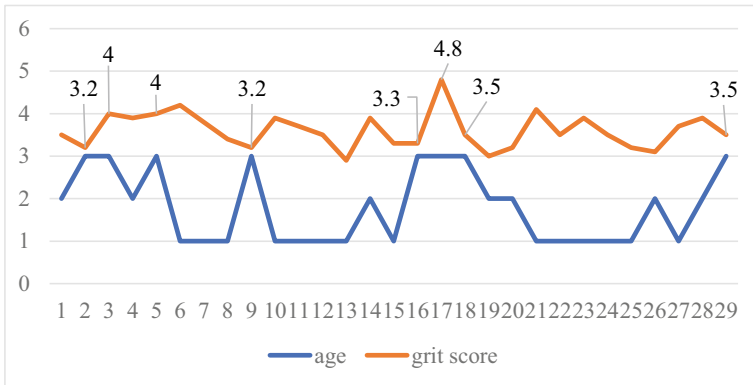


Fig. D.1 Relationship of age and grit scores in German entrepreneurs

Appendix E

Table E.1 Measurement model (adapted from Hooi et al., 2016)

First-order constructs	Second-order constructs	Scale type	Item	Factor loading	AVE	CR
Sustainability focus		Reflective	SF 1	0.840	0.663	0.886
			SF 2	0.728		
			SF 3	0.924		
			SF 5	0.749		
Consistency of interest		Reflective	CI 1	0.860	0.599	0.856
			CI 3	0.702		
			CI 4	0.816		
			CI 5	0.706		
Perseverance of effort		Reflective	PE 3	0.856	0.620	0.764
			PE 4	0.712		
			PE 5	0.538		
		Grit	Reflective			0.544
Economic		Reflective	EC 1	0.809	0.675	0.861
			EC 2	0.887		
			EC 3	0.764		
Environment		Reflective	EV 1	0.762	0.653	0.930
			EV 2	0.720		
			EV 3	0.891		
			EV 4	0.849		
Society		Reflective	SC 1	0.782	0.616	0.889
			SC 2	0.722		
			SC 3	0.835		
			SC 5	0.787		
			SC 7	0.794		
				p-value	t-value	VIF
	Sustainable entrepreneurship	Formative	Economic	< 0.001	3.550	1.429
			Environment	0.287	1.190	1.038
			Social	0.144	2.361	1.025

Appendix F

Table F.1 Discriminant validity of construct (adapted from Hooi et al., 2016)

Constructs	SF	Grit	SE
Sustainability focus (SF)	0.814		
Grit	0.555	0.738	
Sustainability Entrepreneurship (SE)	0.638	0.349	Formative

Appendix G

Table G.1 Summary of hypotheses testing (adapted from Hooi et al., 2016)

Hypothesis	Relationship	β	Standard error	t-value	p-value	Decision
H1	SF \rightarrow SE	0.551	0.448	3.427	0.002	Supported
		Sobel Test (z-value)				
H2	SF \rightarrow grit \rightarrow SE	- 0.701	0.258	-	0.483	Not supported

Appendix H

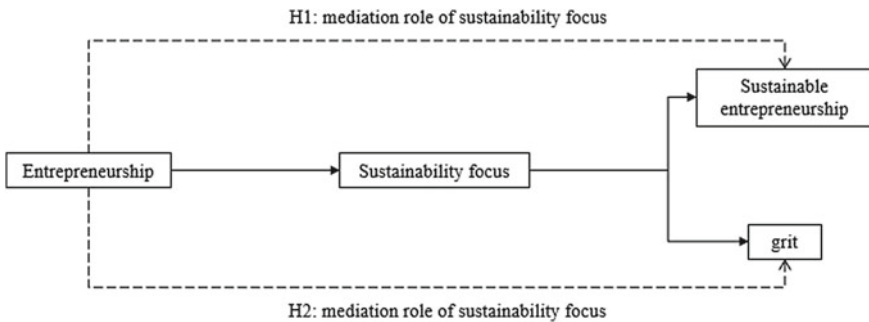


Fig. H.1 Adjusted framework for future research

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