

Article

Overconfidence, Optimism and Entrepreneurship

Indy Bernoster ^{1,2,*}, Cornelius A. Rietveld ^{1,2} , A. Roy Thurik ^{1,2,3}  and Olivier Torrès ³

¹ Department of Applied Economics, Erasmus School of Economics, Erasmus University Rotterdam, 3062 PA Rotterdam, The Netherlands; nrrietveld@ese.eur.nl (C.A.R.); thurik@ese.eur.nl (A.R.T.)

² Erasmus University Rotterdam Institute for Behavior and Biology (EURIBEB), Erasmus University Rotterdam, 3062 PA Rotterdam, The Netherlands

³ Montpellier Business School, 34080 Montpellier, France; Olivier.TORRES@univ-montp3.fr

* Correspondence: bernoster@ese.eur.nl; Tel.: +31-010-408-8947

Received: 4 June 2018; Accepted: 27 June 2018; Published: 28 June 2018



Abstract: Overconfidence is one of the alleged drivers for market entry. However, establishing its effect is challenging and much of the existing entrepreneurship literature confusingly conflates overconfidence with optimism. In the present study, we use validated scales to analyze the relationship between overconfidence and two important aspects of entrepreneurship, while explicitly controlling for optimism. Specifically, we study the role of overconfidence in developing intentions about entering entrepreneurship as well as how overconfidence relates to entrepreneurial orientation. Our findings show that overconfidence is related to intended market entry but not to the market position (entrepreneurial orientation) of the business.

Keywords: entrepreneurial intention; entrepreneurial orientation; optimism; overconfidence

1. Introduction

Entrepreneurship is crucial for economic growth and development [1–3], but the high failure rate of business start-ups [4–6] and relatively low average returns compared to wage work [7] suggest that too many people become entrepreneurs [8–10]. Part of this excess market entry is thought to result from overconfidence about future entrepreneurial success [11–13]. Evidence for this hypothesis has been provided by experimental studies in which optimal criteria for market entry behavior were examined and both actual behavior and expectations were observed [8]. However, experimental studies using students in a laboratory setting have limited external validity. Establishing overconfidence as a driver of entrepreneurial activity using field data is nevertheless challenging for at least three methodological reasons.

First, overconfidence is a heterogeneous concept that includes overestimation, overplacement, and overprecision [14,15]. Overestimation refers to “overestimation of one’s actual performance”, overplacement to “overplacement of one’s performance relative to others”, and overprecision to “excessive precision in one’s beliefs” [16]. These three types may relate differently to aspects of the entrepreneurial process [14].

Second, measures for overconfidence and optimism are often conflated in empirical studies. For example, Trevelyan [17] used entrepreneurial self-efficacy as a proxy for overconfidence, which is conceptually more closely related to optimism than to overconfidence. Similarly, Giacomini et al. [18] argued that self-reports on the lack of importance of entrepreneurial skills proxies overconfidence in entrepreneurial abilities. Nevertheless, interpreting overconfidence as a proxy for optimism appears warranted [14]: lacking entrepreneurial skills is unimportant because everything will turn out well [15]. Unsurprisingly, Parker’s review of the empirical literature on entrepreneurial overconfidence, ends with the conclusion that, “Despite the fact that [over]optimism and overconfidence are distinct concepts, much of the literature confusingly conflates them. At the risk of sounding pedantic,

this practice should be discouraged in future.” [19]. In this respect, Åstebro et al. [14] also noted that, “multiple measures and definitions across empirical studies have made it hard to pin down the precise bias that may be behind entrepreneurship”.

Third, existing field studies linking self-perceptions to entrepreneurial behavior typically used measures of overconfidence that are related to occupational choices and hence are prone to reverse causation problems. For example, the studies by Koellinger and colleagues [10,20] used data from the Global Entrepreneurship Monitor and asked respondents whether they believe they have sufficient skills to start and run a new company. In such a setting, individual beliefs may cause occupational choices, but occupational choices and experience may also cause changes in individual beliefs as a result of self-justification, learning-by-doing, or new information that becomes available over time [21].

Hence, establishing whether overconfidence drives excess market entry using field data is important. This current study attempts to address this research question by analyzing how a particular underresearched type of overconfidence, overprecision, and optimism are related to two aspects of the entrepreneurial process. First, we analyze entrepreneurial intention [22] among students to circumvent the potential danger of reverse causality between labor market status, and overconfidence and optimism. Students still need to choose their main occupation and effects of entrepreneurial experience on overconfidence or optimism are disregarded. In addition, we analyze how overconfidence and optimism are related to entrepreneurial orientation [23] among small- and medium-sized enterprise (SME) owners. The market position of a business (i.e., entrepreneurial orientation) plays a crucial role in competitiveness [24], business performance [25–27], and business survival [28] and is directly linked to the characteristics and behavior of the owner-manager in SMEs.

The main contribution of the present study is the empirical investigation into how overconfidence influences market entry (entrepreneurial intention) and market position (entrepreneurial orientation) using field data. Several studies argued that entrepreneurs are more prone to overconfidence than wage workers [29,30]. However, existing field studies on entrepreneurial overconfidence focused only on a relatively specific control group, such as managers [29,31], or have no control group [13]. More importantly, because entrepreneurial experience may induce overconfidence [29,31,32], it is difficult to conclude from these studies whether overconfidence is indeed a driver of (excess) business entry. Therefore, the present study investigates the effect of overconfidence on entrepreneurial intention among individuals that still must choose their main occupation to establish if overconfidence is related to entrepreneurial entry. Subsequently, the relationship between overconfidence and entrepreneurial orientation is analyzed among entrepreneurs to understand how overconfidence is related to the business’s market position.

Alongside, our study contributes to the literature by distinguishing the effect of overconfidence from the effect of optimism by analyzing validated measures for both simultaneously. Two earlier studies related both overconfidence and optimism simultaneously to aspects of the entrepreneurial process. The working paper by Koudstaal et al. [33] showed that entrepreneurs are more optimistic than managers and employees, but they found no difference between entrepreneurs and managers with regard to overconfidence (viz. overestimation). However, their incentivized measure of overestimation, which was the congruence between the number of correctly solved test questions and the number of forecasted correct questions being awarded with €100, may have led to situations in which individuals purposely fail all test questions to correctly forecast 0 correct answers to win €100. Åstebro et al. [34] studied the role of optimism and overconfidence in perseverance of inventors after receiving advice to stop their business activity. Their overconfidence measure relates to overplacement, as it compares the participant’s estimate of being right to the group’s estimate of being right. They found that investors are more optimistic and overconfident than the general population, and that optimism is related to continuing to spend money (not time) after receiving advice to stop. Overconfidence is not related to continuing spending time and money after receiving advice to stop.

The present study distinguishes overconfidence (viz. overprecision) from optimism, in explaining entrepreneurial intention and entrepreneurial orientation. If the effects of overconfidence and optimism

are distinct, this would clearly underscore Parker's warning. However, if not, despite the theoretical distinction between the two concepts, it would indicate the practical (empirical) irrelevance of Parker's advice. Moreover, Cooper et al. [12] showed that it is empirically impossible to distinguish overestimation and overplacement as types of overconfidence from optimism, we attempt to show whether it is possible to empirically distinguish between overprecision and optimism. Hence, our study aims to show the extent to which it is possible and necessary to distinguish between overconfidence (overprecision) and optimism in (future) studies linking cognitive biases to the entrepreneurial process.

2. Theory and Hypotheses

The analysis of cognitive biases related to entrepreneurial decision making is an important research area [14,30,35,36] and overconfidence is amongst the most-studied biases [13,29,31]. Overconfidence can lead to individually suboptimal decisions. For example, overconfidence in stock investment reduces returns on investment [37], managerial overconfidence can generate distortions in corporate investment [38], and the trading volume in financial markets is higher than the rational equilibrium expectation due to the presence of overconfident traders [39]. However, overconfidence can also be a positive driver at the individual level. Although accurate judgment and the absence of overconfidence are signs of good mental health [40,41], overconfidence can also increase ambition, morale, resolve, and persistence [21,42]. In addition, at the social level, a certain amount of overconfidence can provide positive information externalities [43].

Due to the differences in economic uncertainty and the type of authority faced by entrepreneurs compared to employees, two different mechanisms lead to a higher level of overconfidence among entrepreneurs [31]. The first mechanism assumes that overconfident individuals self-select into entrepreneurship. Those who are more susceptible to the use of bias and heuristics to make decisions may be more inclined to become entrepreneurs because these biases and heuristics can be effective and efficient guides to decision-making in highly uncertain and complex environments [29,44]. This view implicitly implies that the source of overconfidence is in the individual and it is thought to be a personality trait that is not limited to one specific situation or point in time to some extent. The second mechanism assumes that the entrepreneurial environment itself triggers overconfidence. Entrepreneurs constantly face situations that tend to overload their information processing capacities and that are characterized by high levels of uncertainty, novelty, emotion, and time pressure. Together, these factors may increase entrepreneurs' susceptibility to a number of cognitive biases [30]. Thus, overconfidence could be a function of the contextual factors encountered by entrepreneurs.

The first mechanism relates to the finding in experimental settings that overconfidence is related to market entry [8]. When subjects' post-entry payoffs are based on their own abilities, individuals tend to overestimate their chances of relative success and enter more frequently than they should. The second mechanism underscores the importance of measuring overconfidence in field data before market entry, to analyze its effect on entrepreneurial entry. Measuring (over)confidence by asking individuals about whether they believe they have sufficient skills to start and run a new company after actual market entry as reported by Koellinger et al. [10,20], makes it difficult to draw definite conclusions about the relationship between overconfidence and (excess) market entry due to Baron's argument [30] as well as self-justification. Hence, to draw conclusions about whether overconfidence drives market entry, individuals should be followed throughout their working life, and overconfidence should be measured before and after actual entry.

To draw conclusions about the relation between overconfidence and entrepreneurship, distinguishing between types of overconfidence is important [14]. Three subtypes of overconfidence exist: overestimation, overplacement, and overprecision, where overestimation refers to the overestimation of one's actual performance, overplacement to the overplacement of one's performance relative to others, and overprecision to the excessive precision in one's beliefs [16]. Overestimation is closely related to optimism because optimists overestimate the probability of success [19,45]. Overplacement requires a direct comparison with a reference group but is often

observationally equivalent to overestimation and optimism. For instance, Cooper et al. [12] could not distinguish between them in a sample of entrepreneurs. Overestimation and overplacement (and optimism) both lead to positively biased perceptions about expected returns in entrepreneurship, so are therefore expected to be positively related to entrepreneurial entry [14].

Overprecision involves a somewhat different cognitive bias, corresponding to Parker's [19] conceptualization of overconfidence as underestimation of the degree of variation in possible outcomes. The effects of overprecision on entrepreneurship are underexplored [14]. However, a positive relation with entrepreneurial entry may be expected. Overprecision may lead to positively biased perceptions about expected returns in entrepreneurship, but for a different reason than overestimation and overplacement. Overprecise individuals underestimate the variance in possible outcomes. The distribution in entrepreneurial income is known to be extremely skewed, with median returns far below the mean [7,46]. For occupational choice decisions, considering this strong left-skewness of the entrepreneurial income distribution is essential. Overprecision may lead to an overly strong focus on the mean of the income distribution and may hence lead to biased perceptions about the expected returns in entrepreneurship.

To circumvent the potential problem of examining an effect from the entrepreneurial context on entrepreneurship [30], in our empirical analysis we focused on a sample of individuals that still need to choose their main occupation, to test whether overconfidence (overprecision) drives market entry. Specifically, we analyzed entrepreneurial intentions among students. Even though this analysis requires a trade-off with not measuring actual entrepreneurial behavior, according to the theory of planned behavior [47] and several empirical studies [48], actual (entrepreneurial) behavior is well predicted by (entrepreneurial) intentions [49]. For instance, a study by Kautonen et al. [50] found a significant and positive relationship between intentions to start a business and actual activities aimed at starting a business. Hence, we analyzed entrepreneurial intention among students to test whether overconfidence (overprecision) drives market entry. Our first hypothesis is:

Hypothesis 1. *Overconfidence (overprecision) is positively associated with entrepreneurial intentions among students.*

Despite the fact that those susceptible to the use of biases and heuristics are expected to be more likely to become entrepreneurs because overconfidence may help to cope with highly uncertain and complex environments [29,31], overconfidence remains a cognitive bias that distorts rational decision making. For example, it is associated with distortions in corporate investments [38] and investments in high-risk innovation projects [51,52]. Upper echelon theory [53] describes how business outcomes, such as the market position of the business, are influenced by the background characteristics of the managerial team. In line with this theory, Simsek et al. [54] found evidence that the personality of the chief executive officer (CEO) influences their firms' entrepreneurial orientation. Entrepreneurial orientation is the strategic position of a business in the market. The degree of entrepreneurial position in this strategy includes the level of proactivity (for instance, in attacking competitors), risk taking, and innovativeness [23].

Engelen et al. [55] argued that overconfidence (overestimation) fosters entrepreneurial orientation, because overconfident CEOs may depart from established practices to pursue new opportunities as they feel in control of all current activities and believe that they are better than others in successfully completing challenging tasks [56]. Nevertheless, the search for challenging tasks may also result in cognitive overload and goal conflict when the CEO sees new opportunities everywhere [57]. In addition, overconfidence may cause the CEO to commit resources very quickly, which may adversely affect the business' ability to exploit even more profitable opportunities. Specifically, overprecision may deteriorate the entrepreneur's experimentation phase [14]. Along the same vein, Herz et al. [58] stated that overprecision reduces the perceived value of exploring new ideas. In an experimental

setting, they found that overprecision was negatively related to experimentation and realized profits. Hence, some types of overconfidence may make individuals less fit for entrepreneurship.

Altogether, we hypothesize that overconfident (i.e., overprecise) entrepreneurs are more likely to exploit their current business strategy rather than explore alternative business opportunities. This lowers their entrepreneurial orientation, in particular their proactivity and innovativeness. All entrepreneurs in our sample operated in small and medium sized enterprises, and the link between personality and entrepreneurial orientation is likely to be even stronger for them than for entrepreneurs running large businesses. Hence, in line with upper echelon theory, our second hypothesis is:

Hypothesis 2. *Overconfidence (overprecision) is negatively associated with entrepreneurial orientation among entrepreneurs.*

3. Materials and Methods

3.1. Samples

For the purpose of this study, scales for overconfidence and optimism were included in two ongoing data collection efforts on entrepreneurship at our institutions.

Our first dataset contained data about students from Erasmus University Rotterdam in the Netherlands, who were recruited from different faculties by various university recruitment systems, including the economics department, the psychology department, and one where students of all faculties could apply. Data were collected between May 2015 and April 2016. A total of 182 participating students filled in a questionnaire, but due to missing observations, our analyses were performed on 173 students. The average age of the Dutch students was approximately 21 years and 55% were female.

Our second dataset contained data collected by Observatoire AMAROK (<http://www.observatoire-amarok.net/en>), partner of the Montpellier Business School in France. AMAROK runs a panel of small and medium enterprise (SME) owners to analyze the health of entrepreneurs. Measures for overconfidence and optimism were included in the survey that ran from the end of 2015 to the beginning of 2016. There are 287 individuals in the dataset but due to missing observations, our analysis was performed with 253 SME owners. The average age of these SME owners was 50 years and 21% were female.

3.2. Variables and Measures

3.2.1. Dependent Variables

In the Dutch dataset, we measured entrepreneurial intentions with the 6-item scale introduced by Liñán and Chen [22]. The items on this scale can be answered on a 7-point Likert scale, and include “I am ready to do anything to be an entrepreneur”, “My professional goal is to become an entrepreneur”, “I will make every effort to start and run my own firm”, “I am determined to create a firm in the future”, “I have very seriously thought of starting a firm”, and “I have the firm intention to start a firm someday”. Cronbach’s alpha was 0.95, which indicates high internal reliability. Entrepreneurial orientation was measured in the French dataset using the French version of the 9-item scale of Covin and Slevin [23], also measured on a 7-point Likert scale. Of these nine items, three items addressed innovativeness, three addressed proactiveness, and three addressed risk-taking. Cronbach’s alpha was 0.73, indicating that internal reliability was good.

3.2.2. Overconfidence

The overconfidence scale of Russo and Schoemaker [59] was used in both the Dutch and French datasets. This scale measures overprecision and includes 10 general knowledge items for which participants have to provide a lower and an upper bound such that they are 90% sure the correct answer falls within their interval. The items are “Martin Luther King’s age at death”, “Length of the Nile River”, “Number of countries that are members of OPEC”, “Number of books in the Old Testament”,

“Diameter of the moon”, “Weight of an empty Boeing 747”, “Year in which Wolfgang Amadeus Mozart was born”, “Gestation period (in days) of an Asian elephant”, “Air distance from London to Tokyo”, and “Deepest (known) point in the oceans”. The challenge is not to demonstrate general knowledge, but to be neither too narrow (overconfident) nor too wide (underconfident). The individual’s score for overconfidence equals the number of questions for which the true answer falls outside the indicated interval, minus 1 (the expected number of answers outside the interval).

3.2.3. Optimism

To measure optimism, both datasets included the Life Orientation Test-Revised (LOT-R) 10-item scale, which is measured on a 5-point Likert scale. The items are “In uncertain times, I usually expect the best”, “It’s easy for me to relax” (F), “If something can go wrong for me, it will” (R), “I’m always optimistic about my future”, “I enjoy my friends a lot” (F), “It’s important for me to keep busy” (F), “I hardly ever expect things to go my way” (R), “I don’t get upset too easily” (F), “I rarely count on good things happening to me” (R), and “Overall, I expect more good things to happen to me than bad”. The items indicated with (R) were reverse coded before inclusion. As usual, the fillers (F) in the LOT-R scale were not included in the final optimism measure. Cronbach’s alpha 0.69 and 0.70 for the Dutch and French datasets, respectively, indicating that internal reliability is good and similar across the two datasets.

3.2.4. Control Variables

Due to the well-documented relationship between entrepreneurship and age [60] and sex [61], and some indications exist that overconfidence is related to these variables [62,63], we controlled for age (in years) and sex (0 = female, 1 = male). We also controlled for education, measured as the average grade over the past year for the Dutch students and as the highest completed education level for the French SME owners, because of the relationship between entrepreneurship and education [64] as well as between overconfidence and education [65].

3.3. Analysis

The dependent variables in our analyses were continuous and hence we used Ordinary Least Squares (OLS) regression to test our hypotheses. For each dataset, two models were analyzed. In Model 1, only overconfidence was included as an explanatory variable in addition to the control variables. Model 2 included both overconfidence and optimism to analyze the distinctness from optimism of the relationship between overconfidence and our dependent variables. To facilitate the comparison of effect sizes, all variables except sex were standardized before analysis.

4. Results

Tables 1 and 2 show the means, standard deviations (SDs), variance inflation factors (VIFs), and correlations of the main variables in our analysis of the Dutch and the French datasets, respectively. An unpaired two-sample *t*-test showed that the mean value for overconfidence in the French SME owners (7.08) was significantly higher ($p < 0.001$) than that of the Dutch students (5.73). A possible interpretation for this difference is that entrepreneurs are more overconfident than students, but factors like culture complicate the direct comparison of means across our two samples. The means for optimism were similar across the two datasets: 3.69 in the French dataset and 3.44 in the Dutch dataset, although a *t*-test on the difference provided a *p*-value less than 0.001. Among the independent variables, correlations ranged from -0.17 to 0.21 for the Dutch dataset and from -0.14 to 0.17 for the French dataset. Notably, the correlation between overconfidence and optimism was weakly negative ($r = -0.17$, $p < 0.05$) in the Dutch dataset and insignificant ($r = -0.11$) in the French dataset.

Table 1. Descriptive statistics of the Dutch dataset ($N = 173$). Mean, standard deviation (SD), variance inflation actor (VIF), correlations, and Cronbach's alpha (diagonal) are displayed.

Variable	Mean	SD	VIF	1	2	3	4	5
1. Entrepreneurial Intention	3.28	1.55		0.95				
2. Overconfidence	5.73	2.20	1.07	0.21 **	-			
3. Optimism	3.44	0.56	1.10	0.16 *	-0.17 *	0.69		
4. Age	20.64	2.02	1.05	0.15 *	-0.01	0.05	-	
5. Gender	0.45	0.50	1.02	-0.04	-0.11	0.01	0.07	-
6. Education	6.89	0.84	1.10	-0.15 *	-0.16 *	0.12	0.10	0.01

Note. * $p < 0.05$, ** $p < 0.01$.

Table 2. Descriptive statistics of the French dataset ($N = 253$). Mean, SD, VIF, correlations, and Cronbach's alpha (diagonal) are displayed.

Variable	Mean	SD	VIF	1	2	3	4	5
1. Entrepreneurial Orientation	4.06	0.93		0.73				
2. Overconfidence	7.08	1.50	1.05	-0.02	-			
3. Optimism	3.69	0.65	1.02	0.17 **	-0.11	0.70		
4. Age	50.04	8.09	1.06	-0.10	-0.13 *	0.05	-	
5. Gender	0.79	0.41	1.01	-0.04	-0.01	-0.02	-0.01	-
6. Education	3.79	1.18	1.04	-0.02	-0.11	0.02	-0.14 *	-0.07

Note. * $p < 0.05$, ** $p < 0.01$.

To check for multicollinearity, we examined the VIFs (Tables 1 and 2). The highest VIF was 1.10 in the Dutch dataset and 1.06 in the French dataset, indicating a low likelihood of multicollinearity [66]. We also controlled for common method bias (CMB) by applying Harman's single-factor test. The rule of thumb is that a single unrotated principal component should not explain more than the threshold level of 50% of the variance [67] for all the indicators measured using the same method. Our results showed an explained variance of 31.7% for the Dutch dataset and 16.9% for the French dataset, indicating no danger of CMB issues.

Table 3 shows the results of the regression analyses using the two datasets. Overconfidence was positively associated with entrepreneurial intentions among the Dutch students (Model 1). The coefficient in Model 1 indicates that a one SD increase in overconfidence was associated with an increase of 0.189 SD, on average, in entrepreneurial intention. The inclusion of optimism in Model 2 increases the coefficient of overconfidence (0.221). Optimism was also significantly positively associated with entrepreneurial intentions. A one SD increase in optimism was associated with a 0.208 SD increase in entrepreneurial intention, on average. These results provide statistical support for Hypothesis 1.

Table 3. Ordinary Least Squares (OLS) regression results: coefficients with standard errors in parentheses.

Variable	Entrepreneurial Intention (Dutch Students)		Entrepreneurial Orientation (French Entrepreneurs)	
	Model 1	Model 2	Model 1	Model 2
Intercept	0.057 (0.099)	0.048 (0.097)	0.123 (0.137)	0.113 (0.135)
Overconfidence	0.189 * (0.075)	0.221 ** (0.074)	−0.040 (0.062)	−0.023 (0.061)
Optimism		0.208 ** (0.074)		0.166 ** (0.062)
Age	0.174 * (0.075)	0.167 * (0.074)	−0.116 (0.067)	−0.123 (0.066)
Sex	−0.066 (0.148)	−0.060 (0.146)	−0.108 (0.153)	−0.102 (0.151)
Education	−0.141 (0.077)	−0.160 * (0.076)	−0.039 (0.064)	−0.041 (0.063)
F-value	4.113	5.004	0.914	2.189
p-value	(0.003)	(0.000)	(0.456)	(0.056)
R-squared (adj.)	0.068	0.104	−0.001	0.023
N	173	173	253	253

Note. * $p < 0.05$, ** $p < 0.01$.

To alleviate concerns about possible confounding by individual risk preferences [68] or having parents with entrepreneurial experience [69], we performed a robustness check by controlling for these factors in the model. We used the eight-item Brief Sensation Seeking Scale (BSSS), which uses a five-point Likert scale [70]. Cronbach's alpha was 0.78. In Models 1 and 2, a positive and significant association between risk and entrepreneurial intention was found ($\beta = 0.356$, $SE = 0.070$, $p < 0.001$ and $\beta = 0.326$, $SE = 0.071$, $p < 0.001$, respectively). Nevertheless, the coefficients of overconfidence remained similar in size, magnitude, and significance. The coefficient for optimism in Model 2 decreased to 0.129 ($SE = 0.072$, $p = 0.075$) and was only significant at the 10% level. Hence, the effect of optimism in Table 3 was attributed to risk preferences in this extended model. However, our conclusion about Hypothesis 1 did not change when risk preferences were included in the model.

Using a *t*-test, we found that the average overconfidence level of students who grew up with at least one of their parents owning a firm ($N = 57$) did not significantly differ ($p = 0.57$) from the average of students who did not grow up with at least one parent owning a firm ($N = 124$). However, the mean of entrepreneurial intention was significantly ($p < 0.05$) higher for students with parents having their own firm (mean = 3.71, $N = 57$) than for students without that kind of parent (mean = 3.03, $N = 124$). Hence, we tested whether our main results changed when including a binary variable in the regression, indicating whether at least one of the parents owns a business. Although this binary variable was significantly associated with entrepreneurial intention in both Model 1 ($\beta = 0.434$, $SE = 0.157$, $p < 0.01$) and Model 2 ($\beta = 0.378$, $SE = 0.156$, $p < 0.05$), the coefficients for overconfidence and optimism were similar as in our main specification. That is, in Model 1, overconfidence was significantly associated with entrepreneurial intention ($\beta = 0.201$, $SE = 0.073$, $p < 0.01$) and in Model 2, both overconfidence and optimism were significantly associated with entrepreneurial intention ($\beta = 0.228$, $SE = 0.073$, $p < 0.01$ and $\beta = 0.182$, $SE = 0.074$, $p < 0.05$, respectively).

Also, 7.5% of the Dutch students ($N = 13$) indicated that they were in the process of starting or had started a business at the time of measurement. After removing these individuals from the analysis sample, we found that the coefficients for overconfidence and optimism were similar in size and significance as in our main specification. In Model 1, overconfidence was significantly associated with entrepreneurial intention ($\beta = 0.213$, $SE = 0.078$, $p < 0.01$) and in Model 2, both overconfidence and

optimism were significantly associated with entrepreneurial intention ($\beta = 0.255$, $SE = 0.077$, $p < 0.01$ and $\beta = 0.228$, $SE = 0.078$, $p < 0.01$, respectively). Hence, these findings were in line with our main results.

The analysis of entrepreneurial orientation in the French dataset provided a different picture. As shown in Model 1 of Table 3, we found that overconfidence was not significantly associated with entrepreneurial orientation. The coefficient for overconfidence barely changed after including optimism in Model 2, and hence, we concluded that overconfidence is not associated with the entrepreneurial orientation of SME owners. Accordingly, we did not find evidence supporting Hypothesis 2. However, optimism (Model 2) was significantly and positively associated with entrepreneurial orientation. A one SD increase in optimism was associated with a 0.166 SD increase in entrepreneurial orientation. Dropping overconfidence from this model, which resulted in a model with only optimism and the control variables, did not alter this result ($\beta = 0.142$, $SE = 0.058$, $p < 0.05$).

To further analyze these unexpected results, we included two additional control variables in our analysis. First, we amended Models 1 and 2 with firm size (number of employees including the entrepreneur), because the larger the business, the smaller the influence of the individual characteristics of the owner-manager on entrepreneurial orientation (upper echelon theory). Nevertheless, we found that neither firm size nor the interaction between firm size and overconfidence were significantly associated with entrepreneurial orientation ($p > 0.05$). Secondly, we amended Models 1 and 2 with the number of years the owner-manager had been in leadership. According to Baron [30], being in entrepreneurship may increase overconfidence, but this variable was neither significantly correlated with overconfidence ($p > 0.05$) nor with entrepreneurial orientation ($p > 0.05$). The interaction term with overconfidence was also not significant.

Additionally, we analysed the three subscales (innovation, proactiveness, and risk-taking) of entrepreneurial orientation separately. Table 4 shows that for none of the subscales was there a significant association with overconfidence. The results indicated that the significant association between optimism and entrepreneurial orientation (overall) was primarily present in the proactiveness and risk-taking subscales. Overall, we did not find evidence to support Hypothesis 2.

Table 4. OLS Regression results: coefficients with standard errors in parentheses. Analysis of subscales of entrepreneurial orientation.

Variable	Entrepreneurial Orientation					
	Innovation		Proactiveness		Risk-Taking	
	(French Entrepreneurs)		(French Entrepreneurs)		(French Entrepreneurs)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Intercept	0.201 (0.137)	0.198 (0.137)	0.057 (0.133)	0.049 (0.132)	−0.008 (0.139)	−0.018 (0.137)
Overconfidence	−0.029 (0.062)	−0.025 (0.063)	−0.114 (0.060)	−0.099 (0.060)	0.058 (0.063)	0.077 (0.063)
Optimism		0.038 (0.063)		0.147* (0.061)		0.177** (0.063)
Age	−0.004 (0.067)	−0.005 (0.067)	−0.170* (0.065)	−0.176** (0.065)	−0.076 (0.068)	−0.083 (0.067)
Sex	−0.245 (0.154)	−0.244 (0.154)	0.017 (0.149)	0.023 (0.148)	0.016 (0.156)	0.022 (0.154)
Education	−0.034 (0.064)	−0.035 (0.064)	−0.072 (0.062)	−0.073 (0.062)	0.023 (0.065)	0.021 (0.064)
F-value	0.719	0.646	2.364	3.105	0.661	2.113
p-value	(0.579)	(0.665)	(0.054)	(0.010)	(0.619)	(0.064)
R-squared (adj.)	−0.004	−0.007	0.021	0.040	−0.005	0.022
N	253	253	253	253	253	253

Note. * $p < 0.05$, ** $p < 0.01$.

5. Discussion

The present study shows that, using field data, overconfidence is positively associated with the intention to enter entrepreneurship but it is not associated with the market position of the business (i.e., entrepreneurial orientation). The positive association between overconfidence (i.e., overprecision) and entrepreneurial intention in the Dutch students provides evidence for the argument that market entry may result from overconfidence in future entrepreneurial success [11–13]. No significant association was found between overprecision and entrepreneurial orientation among French SME owners, and this was confirmed using several robustness checks. A possible explanation for this null finding is that overprecision may influence SME owners to depart from established practices to pursue new opportunities, which increases entrepreneurial orientation [55]. This effect of overconfidence has been linked to overestimation rather than overprecision, but it may nevertheless negate the expected negative association between overprecision and entrepreneurial orientation [14,58].

Together, our results suggest that overconfidence (overprecision) may encourage people to enter entrepreneurship but does not influence people to develop a particular entrepreneurial orientation in the market. Hence, whereas the overconfident individuals are most likely to enter entrepreneurship, the low average financial returns in entrepreneurship and chances of business failure seem to be the result of an overcrowded market rather than a group of relatively poorly performing overconfident entrepreneurs. In addition, the results showed that overconfidence and optimism play different roles in the entrepreneurial process. Firstly, the correlation between overprecision and optimism was significantly negative among Dutch students and insignificant among French SME owners. Secondly, in our multivariate models, overconfidence was only significantly associated with entrepreneurial intention, whereas optimism was associated with both entrepreneurial intention and entrepreneurial orientation. These findings fit with the results of Åstebro et al. [34], who found that, among investors, overconfidence was not related to continuing spending time and money after receiving advice to stop, whereas optimism was related to continuing spending money (not time) after receiving this advice. The results for optimism are in line with earlier research showing that students with the intention of starting their own business are more optimistic than students without such an intention [71] and that positive orientation (optimism is one of the components of this construct) is positively related to entrepreneurs' striving to achieve particular goals [72].

Therefore, the hypothesis that too many people become entrepreneurs because of overconfidence seems to only partially explain the relatively low financial returns in entrepreneurship as well as the high failure rates. Our results indeed suggest that overconfidence regarding entrepreneurship starts at the phase of expressing intention to enter an entrepreneurial career. However, entrepreneurial overconfidence does not express itself in the market position of the business. An alternative explanation could be that overconfident entrepreneurs are eliminated from the market quickly after market entry. However, the descriptive statistics in Tables 1 and 2 show that the French entrepreneurs scored significantly higher in overconfidence than the Dutch students. Assuming no difference in the level of overconfidence between Dutch and French citizens in general, this suggests that the French entrepreneurs score high on overconfidence but they nevertheless do not have a certain market position (i.e., entrepreneurial orientation) because of their overconfidence. Hence, overconfident persons select themselves into entrepreneurship but do not have a greater proclivity toward a certain market position that could eventually lead to success. As such, overconfidence should be regarded primarily as a driver of excess market entry and not as a driver of lower entrepreneurial orientation. Thus, an overcrowded market rather than a group of relatively poorly performing overconfident entrepreneurs seems to drive the low financial returns and failure rates.

The overcrowded market explanation preempts policies targeted at reducing the overconfidence of a particular individual entrepreneur because an overcrowded market is not necessarily bad for society. Economists maintain that the crucial role of entrepreneurs in the economy is to absorb uncertainty and to contribute to the accumulation of human capital [73]. New business prospects are always highly uncertain, in particular if the business is set up around a novel product, service, market, or production

method. This uncertainty will result in failures because, for instance, entrepreneurs overestimate their own ability to manage, underestimate the characteristics of competing products, or misinterpret market sentiments. High levels of business births, deaths, expansions, and contractions may thus lead to significant learning processes by improving the capabilities of the workforce from which entrepreneurs typically originate [74].

6. Conclusions

This study analysed how a particular type of overconfidence (overprecision) and optimism are related to two important aspects of the entrepreneurial process: intention and orientation. Using newly collected field data, we showed that overconfidence and optimism play distinct roles in entrepreneurship. Overconfidence selects people into entrepreneurship but does not place entrepreneurs in a particular position regarding entrepreneurial orientation. Hence, we found only partial evidence for the suggestion that overconfidence drives excess market entry, because the entry of many entrepreneurs in the market also positively impacts competition and learning. Optimism, on the contrary, drives individuals into entrepreneurship and is related to the market position entrepreneurs have, in particular with respect to proactiveness and risk taking. The clearly different roles that overconfidence and optimism play in the entrepreneurial process and the fact that optimism and overconfidence were negatively correlated in our samples, means that the two are indeed distinct phenomena. Hence, Parker's warning that overconfidence and optimism should not be conflated is not only warranted from a theoretical but also from a practical (empirical) point of view. Overconfidence (overprecision) and optimism should be treated as distinct constructs in studies investigating their consequences.

The present study does not come without limitations, which can also be considered as directions for future research. First, this study focused on overprecision, which is a specific underresearched type of overconfidence, and optimism. A more encompassing study could analyze overprecision and optimism in conjunction with overestimation and overplacement. Moreover, whereas our study employed general measures for overconfidence and optimism, future studies may want to use domain-specific measures such as overconfidence in entrepreneurial skills. The latter measures may be more directly associated with particular aspects of the entrepreneurial process than general measures. Second, we believe that future studies will benefit from linking types of overconfidence to a more diverse set of aspects of the entrepreneurial process. In particular, the link between overconfidence and entrepreneurial performance deserves research attention. A key aspect may be exit from entrepreneurship, an event that may ultimately be expected to occur due to overconfidence in line with Hypothesis 2. Finally, our samples were cross-sectional in nature. If longitudinal data would have been available, then changes in overconfidence and optimism could have been linked to changes in relevant aspects of the entrepreneurial process. In the present study we proxied the time-dimension by investigating the relation between overconfidence and entrepreneurial intention among Dutch students, and the relation between overconfidence and entrepreneurial orientation among French entrepreneurs. Future studies could collect longitudinal data originating from one country to further investigate the revealed associations in the present study.

Author Contributions: Conceptualization, C.A.R., A.R.T.; Methodology, I.B., C.A.R.; Software, I.B.; Validation, I.B., C.A.R.; Formal Analysis, I.B.; Investigation, I.B., C.A.R., O.T.; Resources, I.B., A.R.T., O.T.; Data Curation, I.B., O.T.; Writing—Original Draft Preparation, I.B., C.A.R.; Writing—Review & Editing, I.B., C.A.R., A.R.T., O.T.; Visualization, I.B., C.A.R.; Supervision, C.A.R., A.R.T.; Project Administration, C.A.R., A.R.T.; Funding Acquisition, A.R.T.

Funding: This research received no external funding.

Acknowledgments: This study builds upon and re-uses parts of the working paper *Living forever: entrepreneurial overconfidence at older ages* [75]. Roy Thurik and Olivier Torrès are members of the Entrepreneurship and Innovation chair, which is part of Labex Entrepreneurship (University of Montpellier, France) and is funded by the French government (Labex Entreprendre, ANR-10-Labex-11-01).

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Audretsch, D.B. *The Entrepreneurial Society*; Oxford University Press: Oxford, UK, 2007.
2. Baumol, W.J. *The Free-Market Innovation Machine. Analyzing the Growth Miracle of Capitalism*; Princeton University Press: Princeton, NJ, USA, 2002.
3. Koellinger, P.D.; Thurik, A.R. Entrepreneurship and the business cycle. *Rev. Econ. Stat.* **2012**, *94*, 1143–1156. [[CrossRef](#)]
4. Dunne, T.; Roberts, M.J.; Samuelson, L. Patterns of firm entry and exit in US manufacturing industries. *Rand J. Econ.* **1988**, *19*, 495–515. [[CrossRef](#)]
5. Geroski, P. What do we know about entry? *Int. J. Ind. Organ.* **1995**, *13*, 421–440. [[CrossRef](#)]
6. Hessels, J.A.; Grilo, I.; Thurik, A.R.; Van der Zwan, P.W. Entrepreneurial exit and entrepreneurial engagement. *J. Evol. Econ.* **2011**, *21*, 447–471. [[CrossRef](#)]
7. Hamilton, B.H. Does entrepreneurship pay? An empirical analysis of the returns to self-employment. *J. Polit. Econ.* **2000**, *108*, 604–631. [[CrossRef](#)]
8. Camerer, C.F.; Lovallo, D. Overconfidence and excess entry: An experimental approach. *Am. Econ. Rev.* **1999**, *89*, 306–318. [[CrossRef](#)]
9. Blanchflower, D.G. Self-employment: More may not be better. *Swed. Econ. Policy Rev.* **2004**, *11*, 15–74.
10. Koellinger, P.; Minniti, M.; Schade, C. “I think I can, I think I can”: Overconfidence and entrepreneurial behavior. *J. Econ. Psychol.* **2007**, *28*, 502–527. [[CrossRef](#)]
11. Roll, R. The hubris hypothesis of corporate takeover. *J. Bus.* **1986**, *59*, 197–216. [[CrossRef](#)]
12. Cooper, A.C.; Woo, C.Y.; Dunkelberg, W.C. Entrepreneurs’ perceived chances for success. *J. Bus. Ventur.* **1988**, *3*, 97–108. [[CrossRef](#)]
13. Wu, B.; Knott, A.M. Entrepreneurial risk and market entry. *Manag. Sci.* **2006**, *52*, 1315–1330. [[CrossRef](#)]
14. Åstebro, T.; Herz, H.; Nanda, R.; Weber, R.A. Seeking the roots of entrepreneurship: Insights from behavioral economics. *J. Econ. Perspect.* **2014**, *28*, 49–69. [[CrossRef](#)]
15. Weinstein, N.D. Unrealistic optimism about future life events. *J. Personal. Soc. Psychol.* **1980**, *39*, 806–820. [[CrossRef](#)]
16. Moore, D.A.; Healy, P.J. The trouble with overconfidence. *Psychol. Rev.* **2008**, *115*, 502–517. [[CrossRef](#)] [[PubMed](#)]
17. Trevelyan, R. Optimism, overconfidence and entrepreneurial activity. *Manag. Decis.* **2008**, *46*, 986–1001. [[CrossRef](#)]
18. Giacomini, O.; Janssen, F.; Shinnar, R.S. Student entrepreneurial optimism and overconfidence across cultures. *Int. Small Bus. J.* **2016**, *34*, 925–947. [[CrossRef](#)]
19. Parker, S.C. *The Economics of Entrepreneurship*; Cambridge University Press: Cambridge, UK, 2009.
20. Koellinger, P.; Minniti, M.; Schade, C. Gender differences in entrepreneurial propensity. *Oxf. Bull. Econ. Stat.* **2013**, *75*, 213–234. [[CrossRef](#)]
21. Szerb, L.; Vörös, Z. Self-efficacy, growth expectations and actual growth: The effect of experience on their revolution and relationship. Unpublished manuscript. **2018**.
22. Liñán, F.; Chen, Y.W. Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrep. Theory Pract.* **2009**, *33*, 593–617. [[CrossRef](#)]
23. Covin, J.G.; Slevin, D.P. Strategic management of small firms in hostile and benign environments. *Strateg. Manag. J.* **1989**, *10*, 75–87. [[CrossRef](#)]
24. Lee, S.M.; Peterson, S.J. Culture, entrepreneurial orientation, and global competitiveness. *J. World Bus.* **2001**, *35*, 401–416. [[CrossRef](#)]
25. Lumpkin, G.T.; Dess, G.G. Clarifying the entrepreneurial orientation construct and linking it to performance. *Acad. Manag. Rev.* **1996**, *21*, 135–172. [[CrossRef](#)]
26. Wiklund, J.; Shepherd, D. Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strateg. Manag. J.* **2003**, *24*, 1307–1314. [[CrossRef](#)]
27. Wiklund, J.; Shepherd, D. Entrepreneurial orientation and small business performance: A configurational approach. *J. Bus. Ventur.* **2005**, *20*, 71–91. [[CrossRef](#)]
28. Rauch, A.; Wiklund, J.; Lumpkin, G.T.; Frese, M. Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrep. Theory Pract.* **2009**, *33*, 761–787. [[CrossRef](#)]
29. Busenitz, L.W.; Barney, J.B. Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *J. Bus. Ventur.* **1997**, *12*, 9–30. [[CrossRef](#)]

30. Baron, R. Cognitive mechanisms in entrepreneurship: Why and when entrepreneurs think differently than other people. *J. Bus. Ventur.* **1998**, *13*, 275–294. [[CrossRef](#)]
31. Forbes, D.P. Are some entrepreneurs more overconfident than others? *J. Bus. Ventur.* **2005**, *20*, 623–640. [[CrossRef](#)]
32. Hsu, D.K.; Wiklund, J.; Cotton, R.D. Success, Failure, and Entrepreneurial Reentry: An Experimental Assessment of the Veracity of Self-Efficacy and Prospect Theory. *Entrep. Theory Pract.* **2017**, *41*, 19–47. [[CrossRef](#)]
33. Koudstaal, M.; Sloof, R.; Van Praag, M. Are entrepreneurs more optimistic and overconfident than managers and employees? Tinbergen Institute Discussion Paper. 2015. Available online: <http://dx.doi.org/10.2139/ssrn.2687101> (accessed on 28 June 2018).
34. Åstebro, T.; Jeffrey, S.A.; Adomdza, G.K. Inventor perseverance after being told to quite: The role of cognitive biases. *J. Behav. Decis. Mak.* **2007**, *20*, 253–272. [[CrossRef](#)]
35. Gorgievski, M.J.; Stephan, U. Advancing the psychology of entrepreneurship: A review of the psychological literature and an introduction. *Appl. Psychol.* **2016**, *65*, 437–468. [[CrossRef](#)]
36. Zhang, S.X.; Cueto, J. The study of bias in entrepreneurship. *Entrep. Theory Pract.* **2017**, *41*, 419–454. [[CrossRef](#)]
37. Barber, B.M.; Odean, T. Boys will be boys: Gender, overconfidence, and common stock Investment. *Q. J. Econ.* **2001**, *116*, 261–292. [[CrossRef](#)]
38. Malmendier, U.; Tate, G. CEO overconfidence and corporate investment. *J. Financ.* **2005**, *60*, 2661–2700. [[CrossRef](#)]
39. García, D.; Sangiorgi, F.; Urosevic, B. Overconfidence and market efficiency with heterogeneous agents. *J. Econ. Theory* **2007**, *30*, 313–336. [[CrossRef](#)]
40. Dunning, D.; Story, A. Depression, realism, and the overconfidence effect: Are the sadder wiser when predicting future actions and events? *J. Personal. Soc. Psychol.* **1991**, *61*, 521–532. [[CrossRef](#)]
41. Fu, T.; Koutstaal, W.; Fu, C.; Poon, L.; Cleare, A. Depression, confidence, and decision: Evidence against depressive realism. *J. Psychopathol. Behav. Assess.* **2005**, *27*, 243–252. [[CrossRef](#)]
42. Johnson, D.D.P.; Fowler, J.H. The evolution of overconfidence. *Nature* **2011**, *447*, 317–320. [[CrossRef](#)] [[PubMed](#)]
43. Bernardo, A.; Welch, I. On the evolution of overconfidence and entrepreneurs. *J. Econ. Manag. Strategy* **2001**, *10*, 301–330. [[CrossRef](#)]
44. Busenitz, L.W.; Lau, C.M. A cross-cultural cognitive model of new venture creation. *Entrep. Theory Pract.* **1996**, *20*, 25–40. [[CrossRef](#)]
45. Sharot, T. The optimism bias. *Curr. Biol.* **2011**, *21*, 941–945. [[CrossRef](#)] [[PubMed](#)]
46. Sorgner, A.; Fritsch, M.; Kritikos, A. Do entrepreneurs really earn less? *Small Bus. Econ.* **2017**, *49*, 251–272. [[CrossRef](#)]
47. Ajzen, I. From intentions to actions: A theory of planned behavior. In *Action Control: From Cognition to Behavior*; Kuhl, J., Beckmann, J., Eds.; Springer: Berlin, Germany, 2017; pp. 11–39.
48. Krueger, N.F.; Carsrud, A.L. Entrepreneurial intentions: Applying the theory of planned behaviour. *Entrep. Reg. Dev.* **1993**, *5*, 315–330. [[CrossRef](#)]
49. Kolvereid, L. Prediction of employment status choice intentions. *Entrep. Theory Pract.* **1996**, *21*, 47–58. [[CrossRef](#)]
50. Kautonen, T.; Van Gelderen, M.; Fink, M. Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrep. Theory Pract.* **2015**, *39*, 655–674. [[CrossRef](#)]
51. Li, J.; Tang, Y.I. CEO hubris and firm risk taking in China: The moderating role of managerial discretion. *Acad. Manag. J.* **2010**, *53*, 45–68. [[CrossRef](#)]
52. Tang, Y.; Li, J.; Yang, H. What I see, what I do: How executive hubris affects firm innovation. *J. Manag.* **2015**, *41*, 1698–1723. [[CrossRef](#)]
53. Hambrick, D.C.; Mason, P.A. Upper echelons: The organization as a reflection of its top managers. *Acad. Manag. Rev.* **1984**, *9*, 193–206. [[CrossRef](#)]
54. Simsek, Z.; Heavey, C.; Veiga, J.J.F. The impact of CEO core self-evaluation on the firm's entrepreneurial orientation. *Strateg. Manag. J.* **2010**, *31*, 110–119. [[CrossRef](#)]
55. Engelen, A.; Neumann, C.; Schwens, C. "Of course I can": The effect of CEO overconfidence on entrepreneurially oriented firms. *Entrep. Theory Pract.* **2015**, *39*, 1137–1160. [[CrossRef](#)]
56. Hayward, M.L.A.; Shepherd, D.A.; Griffin, D. A hubris theory of entrepreneurship. *Manag. Sci.* **2006**, *52*, 160–172. [[CrossRef](#)]
57. Hmieleski, K.M.; Baron, R.A. Entrepreneurs' optimism and new venture performance: A social cognitive perspective. *Acad. Manag. J.* **2009**, *52*, 473–488. [[CrossRef](#)]

58. Herz, J.; Schunk, D.; Zehnder, C. How do judgmental overconfidence and overoptimism shape innovative activity? *Games Econ. Behav.* **2014**, *83*, 1–23. [[CrossRef](#)]
59. Russo, J.E.; Schoemaker, P.J.H. *Confident Decision Making*; Piatkus: London, UK, 1989.
60. Levesque, M.; Minniti, M. The effect of aging on entrepreneurial behavior. *J. Bus. Ventur.* **2006**, *21*, 177–194. [[CrossRef](#)]
61. Minniti, M.; Nardone, C. Being in someone else’s shoes: The role of gender in nascent entrepreneurship. *Small Bus. Econ.* **2007**, *28*, 223–238. [[CrossRef](#)]
62. Bruine de Bruin, W.; Parker, A.M.; Fischhoff, B. Explaining adult age differences in decision-making competence. *J. Behav. Decis. Mak.* **2012**, *25*, 352–360. [[CrossRef](#)]
63. Bengtsson, C.; Persson, M.; Willenhag, P. Gender and overconfidence. *Econ. Lett.* **2005**, *86*, 199–203. [[CrossRef](#)]
64. Dickson, P.H.; Solomon, G.T.; Weaver, K.M. Entrepreneurial selection and success: Does education matter? *J. Small Bus. Enterp. Dev.* **2008**, *15*, 239–258. [[CrossRef](#)]
65. Bhandari, G.; Deaves, R. The demographics of overconfidence. *J. Behav. Financ.* **2006**, *7*, 5–11. [[CrossRef](#)]
66. Diamantopoulos, A.; Riefler, P.; Roth, K.P. Advancing formative measurement models. *J. Bus. Res.* **2008**, *61*, 1203–1218. [[CrossRef](#)]
67. Podsakoff, P.M.; MacKenzie, S.B.; Lee, J.Y.; Podsakoff, N.P. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* **2003**, *88*, 879–903. [[CrossRef](#)] [[PubMed](#)]
68. Nosić, A.; Weber, M. How riskily do I invest? The role of risk attitudes, risk perceptions, and overconfidence. *Decis. Anal.* **2010**, *7*, 282–301. [[CrossRef](#)]
69. Carr, J.C.; Sequeira, J.M. Prior family business exposure as intergenerational influence and entrepreneurial intent: A theory of planned behavior approach. *J. Bus. Res.* **2007**, *60*, 1090–1098. [[CrossRef](#)]
70. Hoyle, R.H.; Stephenson, M.T.; Palmgreen, P.; Lorch, E.P.; Donohew, R.L. Reliability and validity of a brief measure of sensation seeking. *Personal. Ind. Differ.* **2002**, *32*, 401–414. [[CrossRef](#)]
71. Macko, A.; Tyszka, T. Entrepreneurship and risk taking. *Appl. Psychol.* **2009**, *58*, 469–487. [[CrossRef](#)]
72. Laguna, M.; Alessandri, G.; Caprara, G.V. Personal goal realisation in entrepreneurs: A multilevel analysis of the role of affect and positive orientation. *Appl. Psychol.* **2016**, *65*, 587–604. [[CrossRef](#)]
73. Audretsch, D.B. *Innovation and Industry Evolution*; MIT Press: Cambridge, MA, USA, 1995.
74. Metcalfe, J.S. *Evolutionary Economics and Creative Destruction*; Routledge: London, UK, 1997.
75. Rietveld, C.A.; Groenen, P.J.F.; Koellinger, P.D.; Van der Loos, M.J.H.M.; Thurik, A.R. Living forever: Entrepreneurial overconfidence at older ages. ERIM Report Series Research in Management. 2013. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2297699 (accessed on 28 June 2018).



© 2018 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).