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The Impact of Overconfidence on Entrepreneurial Process: Entrepreneurs versus Students

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Empirical research documents that overconfidence has a strong impact on investment decision. In this experimental study using a within-subject design and entrepreneurial process, we detail this relationship by introducing a stage of identification (initial knowledge about the entrepreneurial opportunities to invest in) and evaluation (forecasts to be made) before the investment decision. We also examine the role of expertise by comparing a group of entrepreneurs (320 Tunisian entrepreneurs) and a group of students (70), control in the role of risk aversion, and implement different measures of overconfidence (miscalibration in two formats – the BTA effect and the illusion of control). Our results show that no differences were observed between entrepreneurs and students in the degree of overconfidence. However, overconfidence seems to determine decision-making in a different way across the two groups. Concerning students, we observed that overconfidence influenced general tasks such as identification of the entrepreneurial opportunities but when it came to investing, risk aversion had a major effect. In contrast, entrepreneurs were strongly influenced by their overconfidence. For them, it mainly affected specific tasks (evaluation and investment choices) but, surprisingly, risk aversion had no effect on investment decision. Our results suggest that introducing an entrepreneurial opportunities in the decision process is an aid to understanding the differences between experts and novices.

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1. INTRODUCTION

The traditional approach of finance rests upon the classical hypotheses of the homogeneity of the agents' anticipations and their economic rationality. All the agents are supposed to have the same anticipations and to behave in a rational way.

More precisely, the agents are supposed to be rational in a normative way, it means, that their behavior has to be in accordance with a certain number of axioms. Then they are able to revise their anticipations according to Bayes' theorem when new information arrives on the market. The financial choices they make aim to maximize their utility. These hypotheses form the paradigm of the rational Homo oeconomicus. According to this paradigm, nothing is supposed to affect the rational behavior of an individual, either social influence, psychology, or mood.

After the emergence of the theories related to the markets efficiency, the theorists described a pure and perfect financial universe where the evolution of rates permanently reflects the available information and its rational use. In reality, however, the erratic movements of the stock market indicate that the behavior of the markets permanently involves an important share of psychology [1].

This new behavioral paradigm received an official recognition with the attribution of the 2002 Nobel Prize in Economics to Kahneman for his works which introduced the acquired knowledge from research in psychology in economics. Today, it aims the success of the behavioral finance approach is to prove that the stock-market phenomena which can't be explained in the classical framework can be explained through a better understanding of the individuals' real behavior. Indeed, people create their anticipations in a contradictory way with the supposed rationality of behaviors. In fact, they are subject to biases such as heuristics (of representativeness, anchoring.) and psychological biases (overconfidence).

Overconfidence is one of the most documented behavioral biases [2]. In their synthesis on the foundations of behavioral finance, [1] state that « perhaps the most robust finding in the psychology of judgement is that people are overconfident ». It characterizes an individual having overconfidence in his/ her own competences, capacities or knowledge.

The notion of overconfidence can cover many definitions. It can be defined as the overestimation of an individual's own capacities to make the right predictions (miscalibration). An individual can also be optimistic but in an unrealistic way concerning events connected only at random (irrealistic optimis) and overvalues his/ her capacities compared to other individuals (Better-than-Average effect).

In parallel, solving the decision-making problem is related to brain stimulation which may be different, depending on the individual who will attempt to solve the issue. The experiments conducted by different researchers [3,4] showed that results vary according to the individual's degree of expertise. [5] defined expertise as a number of years of experience or practice. In this literature, entrepreneurs have been insufficiently studied.

In this paper, we analyze the impact of overconfidence along the dynamic process of decision-making with different stages (identification, evaluation, decision). We considered an

investment decision between different entrepreneurial opportunities which are differently known, perceived, judged and evaluated by the participants. Our within-subject experiment also focused on the role of experience by analyzing two groups: 70 students (Bachelor's and Master's Degree levels) and 320 entrepreneurs.

We divided the study into three stages: the judgment, the valuation and the investment decision. We supposed that overconfidence could directly impact these stages, but also the investment decision through the judgment and the valuation process. As a control variable for the investment decision, we included a measure of risk aversion.

The main contributions of our paper to the literature can be summarized as follows. Firstly, people can be overconfident in different ways and this implies different types of measures. In this study, we use four measures. Two of them derive from prior studies that have emphasized the sensitivity to elicitation methods in miscalibration tests, so we integrate two types of frame in the estimation of confidence (a probabilistic and a frequency judgment). The two others are designed to capture the better-than-average effect and the illusion of control. We also compute a composite index based on a factor analysis of these four measures. The second goal is to study more closely how overconfidence influences the decision-making process. The third goal is to contribute to the literature on expertise, by examining the above relationships between overconfidence and decision for professionals (entrepreneurs) and non-professionals (students).

In all, to sum up our main results, overconfidence is clearly observed among experts and non-experts. However, when we detail its effect on decision-making by including an identification/evaluation stage before the investment choice, we document important differences.

For students, we observe that overconfidence influences identification phase such as global knowledge of the entrepreneurial opportunities but when they have to invest in opportunities, risk aversion has a major effect. In contrast, entrepreneurs are strongly influenced by their overconfidence. For them, overconfidence mainly affects specific tasks (evaluation and investment choice) and risk aversion has no effect on investment decision.

The article is structured as follows. In the next section, present an overview of the literature and our theoretical model. This is followed by a discussion of the data collected and the research method. Results are then reported. In the following section, key findings are discussed. Finally, conclusions are presented.

2. LITERATURE OVERVIEW AND THEORETICAL DESIGN

2.1 Overconfidence and Entrepreneurial Decision-Making

Many people are more able than others to discover, evaluate and exploit opportunities, theories that attempt to address this problem are multidisciplinary economics, strategy and psychology.

[6] tries to answer this question by conducting a study of behavioral biases. The study of these biases comes from psychology that challenges the conventional view of financial rationality of the subject. One of the violations of the classical theory is the overconfidence factor.

These authors studied 2,994 entrepreneurs start-up newly created their chances of success. Contractors are asked about (a) "What are the chances of success of their business?", "(B)" What are the chances that a similar business to their success? ". For these two questions entrepreneurs have expressed their chances of success in the most pessimistic 0% to 100% more optimistic. The average responses regarding the evaluation of its own success is 81%, while evaluating the success of the business even worn by someone else is much lower, 59%. Note that almost 33% of individuals responded 100% for the success of their project. The authors justify this optimism by the belief of the entrepreneur in his own abilities, unrealistic optimism.

Overconfidence is the mental state of a person who overestimates his personal ability in terms of making correct choices. [7] indicate that when the task and the environment is complex, individuals tend to be subject to behavioral biases that lead to non-rational judgments.

Overconfidence is actually a tendency of individuals to overestimate their abilities and/or skills. The individual feels he has such complete mastery over various aspects of a problem, at which he fails consciously or not, to consider the severity of the problems. This overconfidence can obviously lead to cognitive biases or errors of judgment. According to [8], this heuristic is explained in various ways. On the one hand, when policy makers assess their likelihood of success, they tend to omit the factors they cannot control and that may cause a failure. Instead they focus only on the factors they can control. On the other hand, the fact of exaggerating the extent of their control can reassure policy makers, and reduce the anxiety experienced when in an uncertain environment.

2.2 Research on Experts and Laymen

In this paper, we focus our attention on the differentiation between laymen and experts. Such opposition will be studied concerning the degree of overconfidence and decision-making. In past literature, differences have been observed between these two populations both on their level of overconfidence and their performance ability.

[9] show that experts spend much more time, in adjusting the information, than novices, which allows better control of the problem they face. This control is possible by repeating the same process which, then, becomes automatic. Automation allows them to free a part of their memory, which provides a better control of the situation. Experts are gifted with the faculty of processing information-contrary to novices- because they tend to have an overall view of the problem, instead of focusing on a specific point. They will spend much more time defining a problem, rather than solving it.

2.3 Research on the Relation between Overconfidence and Risk Aversion

The relationship between risk attitude and overconfidence has been extensively studied throughout the financial markets. Research on fund managers has shown that the ones with the least experience significantly produce higher returns than their experienced colleagues [10,11,12]).

In their research work, [13,14] indicate that the act of entrepreneurship is directly related to capacity for risk-taking exhibited by the individual.

The perceived risk is actually a problem of choice. The individual does not have all the necessary information, yet nevertheless builds assumptions about the environment. The individual faces cognitive limitations which reduce his expectations, and assign probabilities to negative consequence limits. The individual must demonstrate subjectivity to overcome this problem.

The overconfident entrepreneur will always overestimate his skills and knowledge; in fact, he has the greatest confidence in the accuracy of his own forecasts. Therefore, he will continue his risky behavior.

[15] state that the business environment can strengthen the relationship between the entrepreneur and excess risk. Entrepreneurs often find taking risks more important than the success rate of new business. [6] found that 33% of entrepreneurs have 100% confidence in their project and their chance of success.

The presence of psychological bias, or overconfidence, leads to a lower rate of risk perception [2]. The more confident an entrepreneur is, the more risky the projects which he will invest in. The positive correlation between overconfidence and risk-taking is confirmed by the work of [16,17,15].

2.4 The Model

Our model supposes that overconfidence positively influences investment decision, in line with numerous studies. But this influence could be direct or indirect through an additional stage devoted to identification and evaluation. Fig. 1 depicts both influences. Overconfident people can express overconfident judgment or valuation but do not necessarily act upon them when they make a decision. So we test a direct relationship between overconfidence and entrepreneurial process. We also integrate risk aversion as a control variable, in line with the literature that has pointed out its role on investment decision. According to the literature, risk aversion drives negatively and directly the level of investment in risky entrepreneurial opportunities.

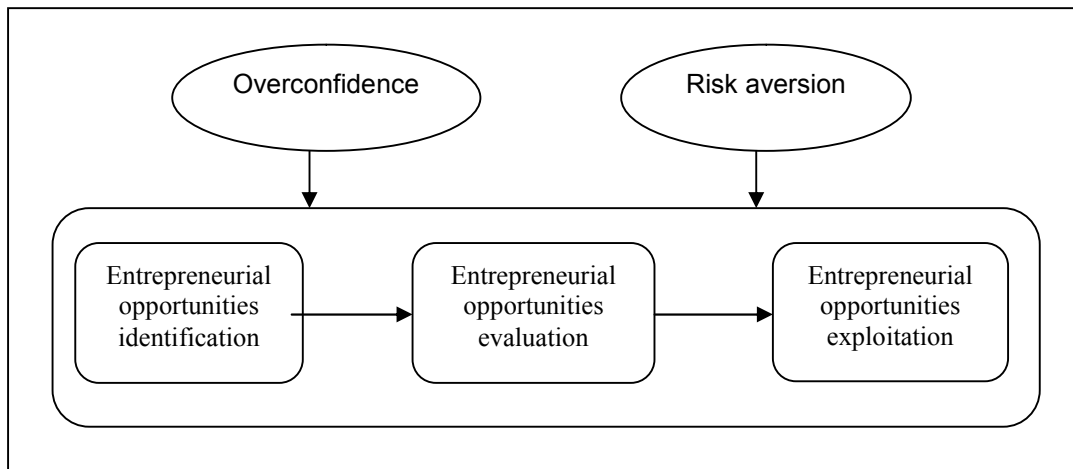


Fig. 1. Conceptual model of research

Moreover, we test whether these relationships between overconfidence and entrepreneurial decision are influenced by expertise. According to the literature, experts are prone to overconfidence, just as people in general, and their overconfidence influences their decision-making. But its effect might not be so direct because they are used to acting through procedures, in particular for important decisions such as investment choices. They are used to integrating entrepreneurial processes in their professional decision-making.

In addition to testing this model, we examine whether there is a relationship between overconfidence and risk aversion.

3. EXPERIMENTAL DESIGN

3.1 Participants

Our within-subject experiment included two types of participants: a group of students and a group of entrepreneurs. The first group was composed of 70 business students from Tunisia University (34 were male). Due to their sparse background in Economics and Finance (42 students were in Bachelor's Degree groups and 28 students were from a Master's program), they were assimilated as novice entrepreneurs.

The second group consisted of 320 entrepreneurs with a variety of experience. We did not split their level of experience (mean = 8.35 years). 254 entrepreneurs were male. Before elaborating the questionnaire, we interviewed the professional subjects in order to better understand their job and scope of decision.

3.2 Task and Procedure

While explaining the instructions, participants could ask questions. One hour was required to participate in the experiment.

Due to the complexity of organizing a seminar session with all the entrepreneurs, we decided to elaborate the questionnaire on a laptop and arrange individual sessions with each entrepreneur. We considered that an appointment to participate to the experiment suggests a sufficient interest for the study so we do not offer any compensation [18,3,4]. Each question was similar for different entrepreneurs and took the same time to fill out. Software was added to the end of a question in order to establish when the time elapsed in order to manage their time equally and to be homogeneous with the students' settings.

For the students, we organized four sessions during the same morning. They had to fill out the same survey as that of the entrepreneurs (few items were different due to the specificity of the entrepreneur' experience), with the same amount of time to answer.

The different steps of the experiment are summarized in Fig. 2. In the first part, the questionnaire measured overconfidence and risk aversion. Then, the second part was designed to detail the stages preceding the decision: (1) a judgment stage with a general perception of each entrepreneurial opportunity (identification), (2) an evaluation stage with forecast estimations for each opportunity, and (3) the investment choice (exploitation).

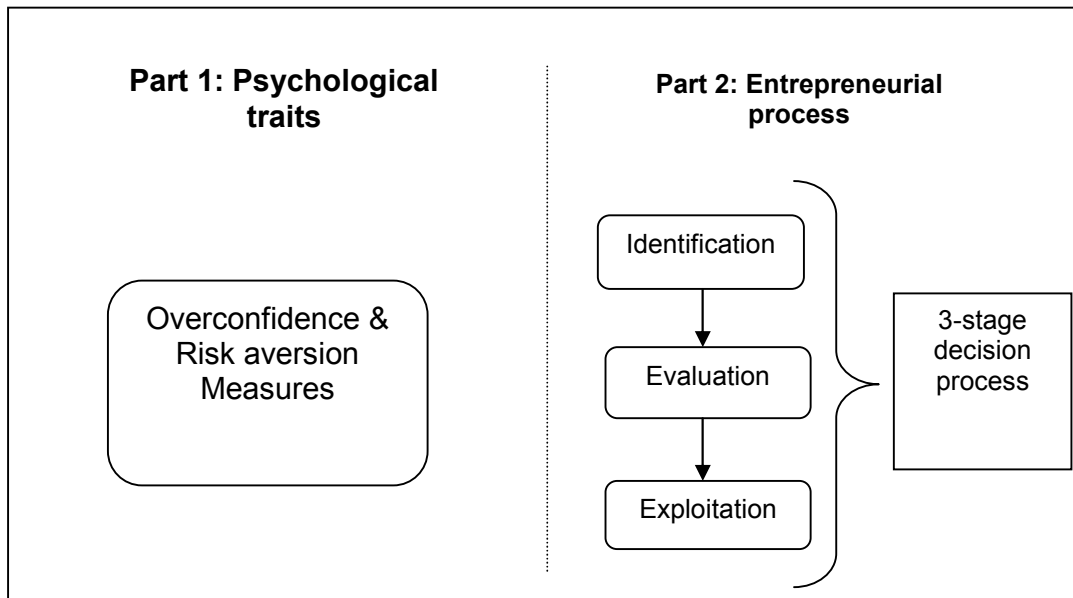


Fig. 2. Experimental process

3.3 Entrepreneurial Process

In general, the decision-making process includes all activities from the time a stimulus for action is perceived until engagement in the action is performed. This series of actions represents the elements related to the research and treatment of the information. In fact, the actions come from verifiable information, and/or sources which are cognitive processes of the entrepreneur, and information sources that they may have difficulty in verifying. Dynamic factors correspond to the contractor and the environment or the process itself, with the identification of the stimulus, and his perceptions of opportunities or any other triggers.

The problem identification phase, meets the entrepreneurial logic, when it comes to identifying opportunities or diagnosing a problem which can bring opportunities.

The evaluation phase addresses the entrepreneurial sense, when the solutions sought involve creativity or innovation. They address the managerial sense, when solutions are sought through optimization and effective management of existing resources. In fact, the choice is based on a spirit of enterprise, and also implies taking risks or using a managerial logic when the choice is based on the value of existing resources.

There are stages of implementation or operation to achieve the solution which most closely meets the essential managerial logic of efficient allocation of resources.

Studies in psychology, finance and entrepreneurship have shown that there may be distinctions in the treatment of a problem and its decisions. These distinctions are made on a linear basis, and may exist between judgment and decision. Studies on overconfidence generally do not distinguish between judgment and decision. The authors implicitly state that the decisions taken by the agents are of the same nature as the judgments they have made previously.

3.4 Measures

3.4.1 Overconfidence

The second part of the experiment analyzes the confidence level of an individual. This concept has been developed around three types of overconfidence that we have seen in the literature i.e., miscalibration, better than the average and the illusion of control.

3.4.1.1 The miscalibration (variable PJ and FJ)

The miscalibration is measured twice using the following judgment probability and frequency of judgment calculation.

Variable miscalibration probabilistic judgment (PJ) is adapted to the study of [19]. The first step of the miscalibration is obtained by requesting a numerical range in which the response to a question is located. After each question, the respondent will assess the percentage of certainty. The confidence level is calculated by using the average percentage of certainty which is then subtracted from the proportion (percentage) of correct answers [4].

$$PJ = \% \text{ certainty} - \% \text{ correct answers}$$

If the answer is zero, the subject will be qualified as properly calibrated. In other words, he or she will assess their knowledge accurately. If the result is greater than zero, it means that the percentage of certainty is higher than the number of correct answers. The individual will then overstate his knowledge, reflecting overconfidence.

The questions within the general culture for the first five of them are the specific culture for the other five. Entrepreneurs were utilizing issues related to the economic and financial news, while students were utilizing issues related to the student world. The five general knowledge questions were the same for both populations.

An additional question was added after the article [20,4], for calculating a second confidence level called "frequency judgment" (FJ). The analysis of the differences in results allows us to enrich the literature on the subject.

The judgment of frequency is represented by the question below. The same way as the variable PJ, the confidence index is obtained by subtracting the value in question from the number of correct answers. Its interpretation is the same as the variable PJ.

According to you, how many correct answers do you have? _____

3.4.1.2 Better than the average (variable BTA)

Better than the average is the second characteristic of overconfidence, which was detailed in the previous chapters. The most famous example is [21], who put forward that 81% of students considered themselves above average when responding to the question:

"How would you address your driving?"

To measure this variable, we took as the first item, [21], and two of the studies by [4] which measured on a Likert scale of five points. The arithmetic average of the responses allows us to obtain a better than the average score.

3.4.1.3 The Illusion of Control (variable IC)

The illusion of control, our third variable in the "overconfidence" concept, is measured according to the same principle as better than the average, i.e. on a Likert scale. The scale score, after an arithmetic average of the responses. This methodology for measuring the illusion of control is adapted from the work of [13,22,4].

3.4.2. Risk aversion

The risk aversion variable is based on the methodology of [23]. The subjects had to allocate an amount ranging from 0 TND to 100,000 TND between a risky and a safe investment. A participant was considered as very risk averse with a high amount in a safe investment.

3.4.3. Entrepreneurial process

2.4.3.1 The identification of entrepreneurial opportunities

According to studies by [24,25], the variable identifying entrepreneurial opportunity was operationalized in terms of the number of opportunities identified. The measurement of this variable is to pose the question "During the past year, how many business opportunities you identify?" The answers to this question have faced eight identification results opportunity (e.g. 0, 1, 2, 3, 4, 5, 6 to 10, or more than 10 opportunities).

3.4.3.2 The opportunity evaluation

In our study, we adopted the proposed measure by [25,26]. This method allows each of the respondents to have the same information [27,28].

Three criteria were established to indicate whether the entrepreneur perceives the opportunity, presented in the case study, as a business opportunity. These items represent a general assessment of the situation.

This is done by utilizing a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree". The mathematical average of the responses allows us to obtain a score evaluation. The higher the score, the more it indicates that the contractor evaluates entrepreneurial opportunities in a positive way.

3.4.3.3 The exploitation of entrepreneurial opportunities

Entrepreneurs must combine resources (human capital and financial capital) in order to exploit new opportunities [29]. Therefore, the contractor must know how to combine their personal resources in an optimal way in order to fully take advantage of the opportunity. Therefore, the entrepreneurial opportunity exploitation phase is designed as a set of allocation decisions (human and financial) resources. This phase of the decision-making process is the result of a good combination of human and financial capital.

In our research, we calculate a score to measure the variable "exploiting opportunities" as outlined in the study of [30].

Participants in our study were asked to answer three questions using assessment 11 points from 0 (0%) to 10 (91-100%) scales.

4. RESULTS AND DISCUSSION

4.1 Overconfidence

Table 1 presents the degree of overconfidence among the four different measures of overconfidence and the composite index. Consistent with the previous literature, our sample shows overconfidence whatever the measures used¹ [31,23,4].

To test these differences, a t-test was performed on the four variables of overconfidence. The results presented in the table below, show the presence of significant differences between experts and novices for both the measures calibration (probability and frequency), and better than the average. While in the variable illusion of control, there was no significant difference between entrepreneurs and students.

This observation confirms the results obtained by [32] who observed significantly higher levels of trust among professional traders than students. Our results are also consistent with those of [33], which showed that experts were better calibrated than novices when the predictability of a task was high, and more overconfident than novices for tasks with low predictability. In this research, the findings are at odds with those of [4], who found no significant difference observed between experts and novices for the various measures of overconfidence.

Table 1. Overconfidence measures

	Entrepreneurs (N : 320)		Students (N : 70)		t-test entrepreneurs v. students
	Mean	SD	Mean	SD	
Miscalibration (probabilistic judgment)	15.81%	16.039%	14.91%	18.443%	-1,988
Miscalibration (frequency judgment)	14,62%	19,197%	14,14%	21,769%	-2,186
Better than average effect (BTA)	16,75%	13,663%	12%	12,137%	-2,686
Illusion of control	40,41%	14,384%	37.79%	16,188%	-1,349
Overconfidence index	21.9%	9.626%	19.7%	11.482%	0.125

None of the t-tests between bankers and students are significant. All the overconfidence variables are significantly different from zero, at least at the 1% level, A mean above 0% shows overconfidence (with a maximum at 100%) and a mean below 0% shows underconfidence (with a maximum at -100%). At 0%, the subject is neither over nor underconfident

¹ We also computed an equally weighted index for overconfidence (instead of using the percentage of explained variance). Results did not differ.

4.2 Risk Aversion

We have also documented no differences in risk aversion between entrepreneurs and students - both groups are risk averse and invest little money in the risky asset (Table 2) compared to the risk-free deposit in the choice submitted by the test. The homogeneity between entrepreneurs and students observed on "risk-aversion" measure is consistent with the results observed by [4]. In fact, these authors found no significant difference between the experts 'bankers' and novices 'students' in their risk behavior.

In addition, we observe a significant correlation between risk aversion and overconfidence (Relation 1). This relationship should be read as follows: the more a contractor overestimates his/her abilities, the more they will be overconfident, and the less they will be risk averse. This negative relationship between overconfidence index and the risk aversion, confirm the results observed in the literature.

Table 2. Risk aversion measure

	Entrepreneurs (N : 320)			Students (N : 70)			t-test entrepreneurs v. students
	Mean	SD	Pearson « OC index »	Mean	SD	Pearson « OC index »	
Risk aversion	44.92%	24.85%	-.230**	18.55%	12.684%	-.096*	-.877

** The relationship is significant at 0.01 (bilateral), * The relationship is significant at 0.05 (bilateral)

4.3 Analysis of the Entrepreneurial Process

The results of Table 3 indicate an average of entrepreneurial opportunity recognition of 80.7%. The majority of entrepreneurs postulate that they can identify more than three entrepreneurial opportunities. These results are consistent with those identified by [25]. These authors, in their research, are an average of the variable of opportunity of 73% identification.

Regarding the evaluation phase, the results show that an average of 18.4% of entrepreneurs can evaluate entrepreneurial opportunities. This confirms the findings of [30,26].

Based on the descriptive statistics (Table 3), it can be seen that on average 50.75% of entrepreneurs make decisions to allocate financial, technical and human resources to exploit entrepreneurial opportunities [30].

After studying the variables of the entrepreneurial processes for an entrepreneurial sample, these variables will now be analyzed for students. The table below shows the descriptive statistics of the variables of the business processes for the sample students.

As has been shown, one of the interests of this experiment is to compare the opposing results found for entrepreneurs and students, by presenting a comparison of the responses of entrepreneurs, opposed to student responses. For this purpose, the students were tested on all variables of the entrepreneurial process (variable identification, evaluation and exploitation of entrepreneurial opportunity), as in previous tests. The results presented in the Table 3 indicate significant differences between entrepreneurs and students.

Table 3. Entrepreneurial process measures

	Entrepreneurs (N : 320)				Students (N : 70)				t-test entrepreneurs v. students
	Mean	SD	Pearson « OC index »	Pearson "RA"	Mean	SD	Pearson « OC index »	Pearson "RA"	
Opportunity identification (OID)	80.7%	41.8%	.200**	-.080	12%	42.3%	.111*	.292	-18.020
Opportunity evaluation (OEV)	18.4%	17.02%	.137*	-.075	6%	18.14%	.016	-.054	-6.445
Opportunity exploitation (OEX)	50.75%	14.63%	.135*	.215	37.24%	17.72%	.089	.025**	-10.070

** . The correlation is significant at 0.01 (bilateral), * . The correlation is significant at 0.05 (bilateral)

The results show the presence of a significant difference between entrepreneurs and students in the three phases of the entrepreneurial process.

In fact, students do not have the capacity, skills and experience necessary to identify, evaluate and exploit business opportunities. While entrepreneurs with their overconfidence behavior are able to identify, evaluate and make decisions to exploit entrepreneurial opportunities (Relation 2).

In reading Table 3, it is interesting to observe the impact of "overconfidence" behavioral variable of the entrepreneurial process in these three phases. This effect seems to be different between entrepreneurs and students.

The results show entrepreneurs with a highly significant relationship between overconfidence and identification, evaluation, exploitation of entrepreneurial opportunity. There is no relationship observed among students in the evaluation and exploitation of entrepreneurial opportunities phases. On the first phase entrepreneurial opportunity identification, there is the presence of a significant correlation with the overconfidence index among students.

This observation raises the question of the effect of experience between overconfidence and the entrepreneurial process. Researches involving related experience and overconfidence have reported opposite results. Some studies have found negative relationship, implying that overconfidence decreased with acquisition experience. In contrast, studies in psychology show that experts tend to be overconfident in most inexperienced subjects, reflecting a positive relationship [34]. This result was later confirmed in research on experimental markets [35,36] also confirm this result by observing a level of overconfidence significantly higher among traders as opposed to students.

Overconfidence does not translate into an overall judgment on knowledge and risk perception among entrepreneurs, but impacts the perception of specific tasks (estimated difficulty making predictions). These tasks are related to the action, and not just the identification of entrepreneurial opportunity. In other words, among entrepreneurs, overconfidence impacts actual results (investment) and specific tasks (evaluation difficulty).

The results show that among the students, the decision to opt for a business opportunity seems to be driven by the level of risk aversion (.025**). The more students are risk averse, the higher the chances of a lower level of investment (Relation 3). It has been shown that overconfidence in students impacts the opportunity identification phase, but during the action, risk aversion dominates their choice. This transformation of non-judgment action is called "think twice" by [37]. In his study, he put forward that people will think twice before making an investment decision, which comes after a profit forecast (evaluation).

Returning to the concept of "think twice", it appears that it has no effect on the experts or entrepreneurs, while the inexperienced students would be sensitive to this process. Indeed, we observe students in a "think twice" because their decision is based on their level of risk aversion and not their immediate impression. In contrast, the "think twice" is not present among entrepreneurs because their decision is based directly on an assessment, not an immediate impression. The experience effect justifies the distinction between the inexperienced and experts [4,38].

5. CONCLUSION

Testing our model allowed us to achieve three findings presented below:

1. The identification of the overconfidence and attitude against risk level of entrepreneurs and students. In the first analysis, it is shown that these populations reveal significantly different behaviors when compared to overconfidence and attitude to risk. On the other hand, it turned out that the overconfidence concept was too consistent and coherent in relation to the literature.
2. In an exploratory phase of the experimental study, the relationship between overconfidence and risk attitude was investigated. The results led to confirmation of the results observed in the literature, namely a much less risk-averse behavior if the overconfidence level is important.
3. Testing the central hypothesis was a study of the impact of overconfidence on the identification and evaluation of entrepreneurial opportunities on the one hand, and the decision to operate, on the other. The study demonstrates significant differences between entrepreneurs and students. According to these results, entrepreneurs are affected by overconfidence in carrying out specific tasks (opportunity evaluation and operational decision). In contrast, overconfidence among students seems to affect the identification of entrepreneurial opportunities phase. This distinction, entrepreneurs-students can be found in the impact of risk aversion on the investment level.

In conclusion, our results suggest that introducing an entrepreneurial opportunities stage in the decision process helps in the understanding of the differences between experts and novices. Additional studies should investigate the stability of these findings over different samples.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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