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Abstract

Purpose – The aim of this paper is to analyze the compatibility between entrepreneurial and social attitudes. Specifically, we analyze if subjects with a more developed economic entrepreneurial attitude exhibit a less social attitude.

Design/methodology/approach – Our methodology integrates an economic experimental approach with a standard entrepreneurial intention questionnaire to analyze the interaction between entrepreneurial and social self-perceptions and behavior.

Findings – There is empirical evidence that experimental entrepreneurial behavior (characterized by detecting an opportunity and accepting risk to take an economic advantage from it in laboratory experiments) reduces the incentive for social behavior. However, this effect does not appear if just self-perceptions instead of experimental behaviors are considered.

Research limitations/implications – The social attitude of entrepreneurs may be overestimated in those empirical research studies based only on data obtained from entrepreneurs' answers to hypothetical questions in a survey.

Originality/value - To the best of our knowledge, this is the first paper presenting a laboratory experiment to represent the key features of entrepreneurial behavior instead of a case-control analysis to set differences in the experimental behavior of sub-samples of subjects defined in terms of their entrepreneurial motivation or experience.

Keywords Social entrepreneur, experimental behavioral economics, risk
Paper type Research paper

1. Introduction

In the last few years, a large number of publications focused on the analysis of social purpose embedded in entrepreneurial activity have appeared in management journals (see, for instance, the literature surveys presented in Zahra et al, 2009 or Weerawardena and Sullivan, 2006). However, there is a lack of consensus in such literature, even in the very same definition of social entrepreneurship. Roughly speaking, there are two approaches to this concept (Austin et al, 2006). In a narrow sense, some authors establish that social entrepreneurship just refers to the phenomenon of applying business expertise and market-based skills in the non-profit sector (Reis, 1999; Thompson, 2002) or in profit organizations developing services specifically designed to meet social needs

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(Drayton, 2002). Alternatively, social entrepreneurship can be defined in a broader way, referring to any innovative, social value-creating activity that can occur within or across the nonprofit, business and government sectors (Austin et al., 2006, Fornoni et al., 2011). In this second approach, entrepreneurs develop commercial markets activities that may have nothing to do with the needs of the society, but generate economic wealth as well as social value (Leadbetter, 1997; Fuqua School, 2005; Zahar et al., 2009), for instance by returning all or part of the benefits to some segments of the society (Tan et al., 2005) or investing part of the profit in their Corporate Social Responsibility (CSR) programs. In the first narrower definition, the main activity of the start-up is specifically designed to generate social value, for instance in those areas where commercial market forces do not meet a social need, such as in public goods (Weisbrod, 1975, 1977) or in the case of contract failures (Nelson and Kranshinsky, 1973). In this case, the performance of the new venture is aligned with its social purpose and the entrepreneur has a single, clear objective: the better the performance, the larger the company's social value and return to the society (Reis, 1999). However, the analysis is not so straightforward for those start-ups whose activity is focused on the production of goods or services that do not provide social value themselves but have been launched by entrepreneurs partially inspired by social goals. Peredo and McLean (2006) characterize this type of social entrepreneur as a person or group that aims at creating social value and, to this end, is able to recognize and *take advantage of an opportunity* and *accept an above average degree of risk* in pursuing his or its commercial and social objectives. However, at this point a relevant question arises in social entrepreneurial literature: Are these two objectives compatible? In other words, is the distinction between commercial and social entrepreneurship dichotomous or can it be more accurately conceptualized as a continuum ranging from purely social to purely economical where entrepreneurs could be able to harmonize both approaches? (Austin et al., 2006).

The goal of this paper is to provide direct empirical evidence that the economic entrepreneurial attitude (characterized by detecting an opportunity and accepting risk to take an economic advantage from it) reduces the incentive for social behavior and limits the return of social value. In other words, the fact of an entrepreneur investing his or her own resources and assuming the risk to take advantage of a business opportunity makes him or her develop a feeling of ownership of the surplus of his or her entrepreneurial activity. As a consequence, entrepreneurs develop a motivation to keep such a surplus for themselves and to behave less socially than others who have made no investment and assume no risk.

This paper is structured as follows. Section 2 presents and motivates our experimental methodological approach and establishes the research hypotheses to be tested. Section 3 describes, in detail, the tools to be used for the measurement of entrepreneurial and social self-perception (Entrepreneurial intention questionnaire) and behavior (Laboratory experiment). In Section 4, the main empirical results obtained with the questionnaire and the experiment, and the research hypotheses are empirically tested. Finally, Section 5 closes the paper with a summary of the main conclusions, an analysis of the limitations of this work, and guidelines for further research on the experimental study of entrepreneurs' social behavior.

2. An experimental approach to entrepreneurial and social behavior

The empirical analysis of the relation between entrepreneurial and social attitude is not an easy task, since it involves the study of entrepreneurs' personal attitudes such as risk taking and social profit-sharing, whose measurement is a more elusive concept than it seemed to be in the first place. The standard approach in the entrepreneurship literature (Ekelund et al., 2005; Liñan and Chen, 2009; Wagner, 2003 among others) is the utilization of a questionnaire to obtain subjective measures of entrepreneurs' self-perceptions, specifically on both their risk aversion and social motivation levels. However, this approach presents some relevant difficulties. As regards the measurement of risk aversion, Caliendo et al., (2006) establish the importance of distinguishing between the objectively measurable risk aversion of an entrepreneur and the corresponding subjective self-perception measured by his or her answers to a questionnaire, no matter if the respondent is asked to describe how she or he would act in real-life risky situations (car driving, financial matters or career) or asked to choose one from a series of hypothetical lotteries (see Dohmen et al. 2005 for further details). On the other hand, the established social norm and the lack of realistic incentives for truth-telling when answering a questionnaire may generate biases on an entrepreneur's self-perception of his or her social motivation to share economic wealth to generate social value and even more in the revelation of his or her hypothetical behavior in this kind of situation. In other words, there may be an incentive for the respondent to consider himself or herself 'generous' and declare that he or she will adopt a more social behavior in a hypothetical situation, when such a declaration will have no real impact on his or her economic wealth level. We define *self-perceived entrepreneurial intention* and *social self-perception* as the entrepreneurial motivation and social sensitivity expressed by the subjects when answering a questionnaire and when answers have no impact on a respondent's economic incentives.

One of the key contributions of this paper is the application of an experimental behavioral economics framework to include in the analysis not only subjects' self-perceptions but also their behavior within a laboratory experiment with real incentives. To the best of our knowledge, the only examples of experimental research on entrepreneurship are the following: Elston et al., (2005, 2006) examine the relationship between overconfidence and the entry decisions of entrepreneurs, as well as studying differences in risk attitudes between full-time entrepreneurs, part-time entrepreneurs, and non-entrepreneurs. They find that part-time entrepreneurs are less confident and more risk averse than either full-time entrepreneurs or non-entrepreneurs. Masclet, Colombiera, Denant-Boemonta, and Lohéaca (2009) also study entrepreneurial risk attitudes, finding lower risk aversion among self-employed individuals than salaried workers. They find that self-employed individuals are willing to pay significantly more to make decisions as individuals rather than in groups. Sandri, Schade, Mußhoff, and Odening (2010) use incentivized experiments to investigate the disinvestment choices of entrepreneurs. They find evidence of late disinvestment by both entrepreneurs and non-entrepreneurs, but no statistically significant differences in behavior between these populations. Finally, Cooper and Saral (2010) use a team production experiment to study whether entrepreneurs prefer to work alone or in a team. They conclude that entrepreneurs, while no more likely to free-ride on their teammates, are substantially more interested in working alone. This suggests that efforts to encourage partnership among entrepreneurs may run contrary to the preferences of this group.

As stated by Cooper and Saral (2010), the benefits of utilizing an experimental approach to analyze entrepreneurial issues include the following three: (1) Subjects are observed in a controlled environment where the experimenter controls what options are available, what information the entrepreneur receives, and how much the entrepreneur earns subject to his or her decisions and the choices of other subjects. (2) Subjects' choices directly affect their monetary payoffs from the experiment. Many of the traits attributed to entrepreneurs have been identified through non-incentivized surveys and there is substantial evidence from the experimental literature that subjects responding to monetary incentives make different choices from subjects responding to hypothetical questions in a non-incentivized survey (Holt and Laury, 2002). This issue is even more relevant in the study of social entrepreneurship, where the entrepreneur has to make decisions on how to share the economic wealth generated by his or her business between personal profits and social value. (3) The artificiality of experiments, often criticized as a liability, is also an asset because it allows us to put entrepreneurs in situations that would not naturally occur, such as the need for decision-making on how to split the earnings obtained by their entrepreneurial projects.

Of course, experiments also present important limitations such as their high implementation costs, which translate into the utilization of samples in general smaller than those in non-incentivized surveys. Thus, large surveys and the utilization of large panel data (e. g. those provided by the Global Entrepreneurship Monitor database) allow for bigger and more representative samples than those possible with experiments. An optimal methodology to analyze entrepreneurial issues should include all these complementary sources of information.

Previous applications of behavioral experimental methodology to analyze entrepreneurial phenomena have followed a case-control approach. In other words, the sample of subjects participating in the laboratory experimented is split into sub-samples in terms of entrepreneurial motivation or experience. Thus, the conclusions of theses studies allow for establishing differences on how subjects in these groups behave during the experiment and then characterize distinctive features of entrepreneurs. To the best of our knowledge, this paper is the first laboratory experimental research where the way in which subjects behave during the experiment provides information on actual entrepreneurial behavior in the sense that: (1) subjects could invest their initial endowment; and (2) assume risk to try to take advantage of a potential business opportunity. We will refer to this kind of behavior as *experimental entrepreneurial behavior*.

The literature in experimental economics has widely analyzed social behavior. The analysis of the dictator and ultimatum games provides us with an experimental approach to studying the egotistic-versus-altruistic motivation to split one's economic wealth, as shown by the more than a hundred experiments related to dictator and ultimatum games that have been published in the last 25 years (see C. Engel 2011). In an Ultimatum game, subjects are paired randomly and anonymously. One of them, called the Proposer, makes a *take-it-or-leave-it* offer to the Responder, by splitting some amount to their partner. The Responder can accept or reject the proposal. In the case that he accepts, he gets the amount offered by the Proposer, who keeps the remaining amount. However, in the case that he does not accept the proposal, both participants get nothing. The Dictator game eliminates the possibility of rejection of the Responder; therefore, the Proposer splits the money and just takes his part. In both scenarios, Game Theory

forecasts that Proposer should take the total amount for himself or herself and nothing for the Responder. Nevertheless, seminal experiments illustrate that the Proposer behaves more generously and Responders behave less rationally than forecasted by Game Theory. For instance, in the Ultimatum game, Proposers offer Responders 40 percent of their total amount on average and Responders reject small offers of 20 percent in the ultimatum game (Engel 2011). One may think that the Proposer behavior obeys a strategic solution to a possible irrational rejection by the Responder. However, even if the Responder has no chance to reject the offer, as in the Dictator game, published experiments show that Proposers still offer positive amounts to Responders, thus demonstrating the existence of social and altruistic behavior. In this paper, we will refer to the way in which agents play Dictator games in the laboratory as *experimental social behavior*.

Figure 1. Entrepreneurial and social attitudes

	Entrepreneurial attitude	**Social attitude**
Questionnaire (no incentives)	Self-perceived entrepreneurial intention	Social Self-perception
Behavioral experiment (with incentives)	Experimental entrepreneurial behavior	Experimental social behavior

Using the concepts of experimental entrepreneurial and social behavior summarized in Figure 1, the above analysis motivates the statement of the following research hypotheses:

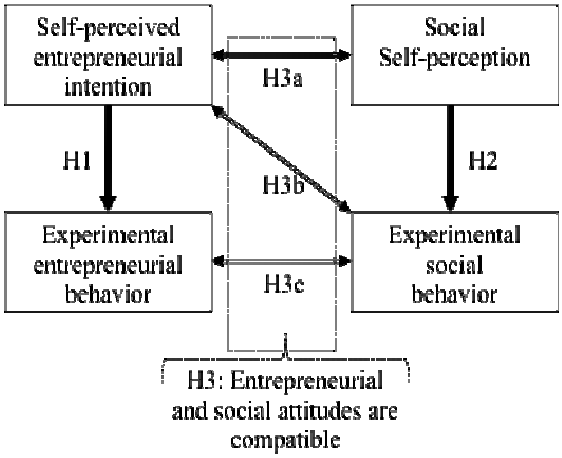
H1. There is a direct relation between self-perceived entrepreneurial intention and experimental entrepreneurial behavior

H2. There is a direct relation between social self-perception and experimental social behavior

H3. Entrepreneurial attitude does not necessarily lessen social attitude (entrepreneurial and social attitudes are compatible)

- *H3a. Self-perceived entrepreneurial intention does not lessen social self-perception*
- *H3b. Self-perceived entrepreneurial motivation does not lessen experimental social behavior*
- *H3c. Experimental entrepreneurial behavior does not lessen experimental social behavior*

Figure 2. Representation of our research hypotheses



3. Research methodology: experiment design

The results of this paper have been obtained by a mixture of a non-incentivized survey and incentivized experiment, whose objective is to stylize the conditions to detect experimental entrepreneurial and social behavior. This experiment was run at Lineex Laboratory of ERI-CES in Valencia University (Spain). There was a session with 60 participants. Our subject pool is drawn from volunteering students of the social sciences campus of the University of Valencia. The recruiting procedure followed the protocol conducted at Lineex.

As mentioned before, entrepreneurial behavior can be characterized as a detection of a business opportunity, and then the investment of an entrepreneur's own resources and risk-acceptance to take economic advantage of such an opportunity. The experiment captures entrepreneurial behavior by presenting an auction to participate in three alternative coordination two-player games, named Games I, II and III, which present different risk and payoff levels. Each game will be played by a pair of subjects, but only one of them, named row-player, will receive a direct payoff depending on the action profile of the coordination game. The other one, named column-player, will only get his payoff later, as a result of a dictator game where the row-player will decide the amount to be allocated to him. Notice that proposals for these dictator games capture the experimental social behavior of the row-player.

Games I, II and III exhibit the following features. Game I provides the row-player with a constant payoff of 10 ECU and presents no risk at all. Game II has a maximal payment of 20 ECU for row-player, if both subjects take action A. This payoff reduces to 14 ECU if they coordinate on action B, inducing a focal action A, which may help players to coordinate. In case of no coordination, row player gets 2 ECU. Finally, Game III provides the highest coordination payoff, but represents the most risky situation, since row-player gets nothing in the case of a coordination failure. Moreover, coordination on both actions provides the row-player with the same payoff, 60 ECU, generating no focal action and making coordination even more difficult. All the three games were presented to the subjects within the same frame (2 x 2 payoff matrices) as shown in table A.

Table 1. Payoff matrices of the coordination games in the experiment

Game I

	A	B
A	10	10
B	10	10

Game II

	A	B
A	20	2
B	2	15

Game III

	A	B
A	60	0
B	0	60

Each round of the experiment consists of three sequential stages. These stages were repeated for 5 rounds and, after that, a surprise restart was announced and subjects played another additional 5 rounds.

First stage: Auction of subject's role and coordination game. Each subject is provided with an initial endowment of 40 ECU. Then, he is asked to invest part of this endowment to bid to gain the right to become a row-player and to choose a coordination game. A random number *s* from 0 to 40 is singled out. If the bid of a participant is larger than *s*, then he can become a row-player and choose a game. If the number of winners is more than half of the population (30 subjects), only the 30 highest bids will become row-players and select the game. If the number of winners is less than 30, a subset of the no-winners is randomly selected to become row-players and asked to choose the game to be played. Once the 30 row-players are defined, the other 30 subjects are randomly assigned as column-players for each of the 30 row-players. This procedure guarantees the assignation of 30 pairs of subjects, each one with a row and column-player, to play coordination game I, II, or III, according to row-player selection.

Second stage: Selection of the coordination game and proposals for the dictator games. In this stage subjects are informed about their roles and row-players decide the coordination game to be played with their corresponding column-players. Then, row-players propose how to split with the column-players each of the four payoffs that they could obtain in the selected coordination game. The column-player is not informed of column-player's proposal for the dictator games.

Third stage: Selection of the actions and realization of the payoffs. Row and column-players choose action A or B. Each row-player gets a total payoff consisting of the aggregation of the remainder of his initial endowment after the auction (40 ECU minus his bid) plus the part of the coordination game payoff corresponding to the actual action profile that he kept to himself when defining the proposal for the dictator game. Column-player gets only the corresponding share of the coordination game payoff specified in the proposal for the dictator games and gets nothing from the initial endowment. At the end of the third stage, and after getting the payoff, the column-player is informed of the four proposals for the dictator game offered by the row-player in this round of the game.

The experiment has several relevant features that need to be highlighted. First, the combination of the subject's bid and the row-player's game selection provides information on his or her risk-aversion level. Second, the row-player must split his 'earnings' at each action profile, forcing a decision of how much he will keep to himself and how much will be altruistically donated. This procedure is equivalent to asking the player to play four dictator games, one for each action profile. An important property of

the dictator game is that it allows for discrimination between strategic and social behavior. Since the column-player does not know the earning allocation decided by the row-player before making his decision and so cannot respond strategically, the row-player's split illustrates his altruistic intentions. As a final remark, since players get larger payoffs when they coordinate and play the same action in Games II or III, randomness in the choice of the actions can be understood as a punishment strategy.

The whole game associated to this experiment (including the auction and the coordination-dictator games) defines a sequential game with three stages. The Sub-game Perfect Nash Equilibrium (PNE) is then the proper equilibrium concept for this game. Row-player's PNE strategy can be described as follows: (1) Row-player's equilibrium bid is 25 ECU; (2) in the equilibrium he keeps all the payoff for himself in the dictator game; (3) he chooses coordination game III if he is risk-loving and coordination game II if he or she is risk neutral or averse and (4) his best response of the action is both A or B (a mixed strategy with uniform support). Column-player's PNE strategy consists of: (1) a bid of 25 ECU in the initial auction; and (2) best response to the mixed strategy of the row-player is a mixed strategy with uniform support. Moreover, there exist pure equilibria that consist of the coordinated action pairs (A,A) and (B,B).

After participating in the experiment, all the subjects were asked to answer a questionnaire on entrepreneurial intentions and social motivation (EIQ). This questionnaire is adapted from the EIQ developed and tested by Liñan and Chen, 2009[1]. The EIQ gathered information on respondents' personal attitudes on entrepreneurship, their perception of the subjective norm on both economic and social entrepreneurship and the figure firm-owners, their self-perception of their entrepreneurial capacity (perceived behavioral control) and their entrepreneurial intention, distinguishing among commercial and social intentions and motivations to launch a firm. The questionnaire was completed with questions of the profile and experience of the respondent and their preferences on a series of hypothetical lotteries provided with a complementary measure of their risk aversion.

4. Results

In this section we show a description of the results obtained from the survey, the subjects' behavior exhibited throughout the experiments, and we test our research hypotheses by comparing the two sets of data.

4.1.- Sample description.

The experiment was conducted in a session with 60 undergraduate students (35 male and 25 female) from different degrees at the University of Valencia (Spain). The average age was 23. The session consisted of a detailed training session, two unpaid practice rounds, and 10 paid rounds. The session lasted approximately 150 minutes, and subjects earned 17€ on average. At the end of the experiment, subjects complete an extended version of the EIQ, where additional questions about risk aversion and social attitude had been incorporated.

[1]Authors thank Professor Liñan for sharing this EIQ and his support in this research

4.2.- Entrepreneurial and social self-perception

The EIQ original questionnaire includes a series of Likert-type items measuring subjects' self-perception on different components of their entrepreneurial attitude. Following Liñan and Chen (2009), we consider the items related to Self-perceived Entrepreneurial Intention (SEI), Personal Attitude (PA), Subjective Norm (SN), Perceived Behavioral Control (PBC) and Social Self-Perception (SSP). The first step in the analysis was to test the reliability of the scales in the survey using Cronbach's alpha. The values (see Table 2) range from 0.739 to 0.875, thus scales may be considered as reliable. After reliability checking, the indices to summarize entrepreneurs' self-perception were constructed. Since EIQ has already been tested and validated (Liñan; and Chen, 2009), we ran an independent factor analysis for each of the measures. As expected, in all of the analysis, both the Kaiser-Mayer-Olkin test for sample adequacy and Bartlett's sphericity test suggest that data are suitable for factor analysis. For SEI, PA, SN and PBC a single factor with eigenvalue greater than 1 arises, thus these four factor analyses allow us to construct four self-perception measures (see Table 2). It must be highlighted that Self-perceived Entrepreneurial Intention is positively correlated with Personal Attitude, Subjective Norm and Perceived Behavioral Control. Thus, as it is established in the literature on entrepreneurial intentions (see, for instance, the survey on the evolution of the models of entrepreneurial intentions presented in Guerrero et al, 2008) personal attitude on entrepreneurship, the perception of the subjective norm, and the entrepreneurial capacity positively influences the intention of start-ups and entrepreneurial projects.

The original EIQ has been extended with additional Likert scale items concerning subjects' self-perception on their social attitude, specifically their social sensitivity, interviewees' opinions on how a firm created by themselves should help to solve the problems of society, and a final set of items exploring viewpoints on the relation between entrepreneurial success and social responsibility. In a factor analysis of the social attitude self-perception items, four different factors with eigenvalues bigger than 1 arise. In other words, entrepreneurs' self-perceptions of their social attitudes capture four uncorrelated dimensions: social motivation (SM), social responsibility (SR), labor responsibility (LR) and indirect social responsibility (ISR). The first dimension, SM, summarizes the social sensitivity of the subject and his self-perceived motivation to make an effort to help to meet society's needs. SR captures social responsibility as a measure of business success; LR is focused on the creation of good labor conditions; and IRS associates social responsibility with the support of NGOs. Thus, SM provides a general measurement of the self-perceived importance of social motivation, meanwhile the other three factors are related with subjects' beliefs on what a social-oriented-business actually is. We can conclude that social attitude is a multidimensional concept and that such multidimensionality may explain the heterogeneity of the definitions of social entrepreneurship that can be found in management literature (Weerawardena and Sullivan, 2006; Zahra et al, 2009).

Table 2: Factor matrix, adequacy tests, reliability indicators and correlation with SEI.

	SEI	PA	SN	PBC	SM	SR	LR	ISR
I have a clear intention to create a company in the future	0.931							
My professional goal is to become an entrepreneur	0.849							
I will create my own company	0.842							
I do not have a clear intention to launch my own company	-0.777							
I will do anything to become an entrepreneur	0.602							
I would prefer any job but becoming an entrepreneur		-0.895						
I would be very satisfied if I became an entrepreneur		0.850						
If I have the resources, I will create a company		0.819						
I would not like to become an entrepreneur		-0.580						
Becoming an entrepreneur implies more positive than negative issues		0.576						
My classmates would support me to launch a company			0.893					
My friends would support me to launch a company			0.852					
My family would support me to launch a company			0.567					
I can manage the procedure to create a company by myself				0.894				
Creating and managing a company would be easy for me				0.743				
If I decided to launch a company, I would have a large probability of success				0.731				
I know all the practical details to launch a company				0.576				
If I decided to launch a company, I would do it to meet social problems					0.869			
I would accept work as a volunteer to solve social problems					0.847			
I would do anything to solve relevant social problems					0.808			
Companies should care about social problems, even if it reduces their profits					0.747			
If I made a lot of money as entrepreneur, I would spend some of it on social issues					0.662			
I would prefer to have lower wage but help to solve social problems with my job					0.557			
A company is successful… if it helps to meet social needs						1.024		
A company is successful… if it develops an active CSR policy						0.892		
A company is successful… if it economically supports social organizations						0.780		
If I launch my company, I will meet social needs by paying high wages to my employees							0.801	
If I launch my company, I will meet social needs by offering good job conditions							0.525	
If I launch my company, I will meet social needs by making high profits and supporting economically social organizations								0.553
KMO	0,861	0.833	0.657	0.782	0.842		0.801	
Bartlett's test sig.	0.000	0.000	0.000	0.000	0.000		0.000	
Cronbach's alpha	0.875	0.857	0.802	0.739	0.868		0.833	
Pearson's Correlation with SEI	1.000	0.856*	0.504*	0.540*	-0.005	0.090	-0.096	-0.126

Factor analyses results: principal axis factorization method, Oblimin rotation for the last factor analysis, and loadings below 0.5 not shown. KMO: Kasier-Meyer-Olkin test for sample adequacy. Bartlett's test sig.: Bartlett's sphericity test significance. Pearson's correlation with SEI: * sig. lower than 0.01.

4.3.- Experimental behavior

Subjects' experimental behavior exhibits the following features:

Analysis of the bids to become a row-player. For each round of the experiment, Table 3 presents a complete description of subjects' bids (including the average and median) and the percentage of subjects bidding the maximum value of 40 ECU. On average, the bid increases during the six first rounds and, from this round on, keeps constant. Most subjects increase their bid period by period, in such a way that the median reaches the maximum value of 40 ECU in the last five periods. In fact, the proportion of subjects bidding 40 ECU rises constantly, being greater than 70% in the periods 8 to 10. Subjects quickly learn that being a column-player will not generate positive profits as the result of two concurrent facts: (1) most row-players choose Game III and (2) row-players do not share the payoffs. This behavior is consistent with expected results if subjects play the Subgame Perfect Nash equilibrium as described in Section 3.

Table 3: Description of bids by round.

	Bids					
	Min	**Median**	**Max**	**Average**	**S.D.**	**% elicited prices = 40**
Round 1	0	32	40	29.8	10.2	16.7
Round 2	0	35	40	30.0	10.7	18.3
Round 3	0	35	40	31.6	9.6	21.7
Round 4	6	37	40	34.6	7.3	35.0
Round 5	5	38.5	40	35.2	8.2	43.3
Round 6	10	40	40	37.5	5.9	58.3
Round 7	10	40	40	35.3	8.6	58.3
Round 8	4	40	40	36.3	8.2	71.7
Round 9	7	40	40	36.5	8.4	78.1
Round 10	0	40	40	34.3	11.0	71.7
Total	0	39	40	34.1	9.3	47.3

The distribution of column-players' bids differs significantly from that of row-players. Column-players' median bid is 32 ECU, while row-players show a higher median of 40 ECU. Moreover, only 17.7% of column-players bid all their 40 ECU, compared to 77% of row-players. This result also holds if the analysis is performed on each of the ten rounds, the median bid of row-players always being higher than the one by column-players.

Analysis of the selection of the coordination game and actions. Row-players chose Game III 88% of the time; Game I is selected only 8% and Game II 4% of the time. These figures are independent of the round. Game I guarantees a payoff of 10 ECU to row-players (assuming they do not share the payoff), but they prefer to play the riskiest coordination game III. In other words, after investing all their initial endowment to become row-players, subjects prefer to assume the risk with the hope of earning 60 ECU. Moreover, coordination takes place more than 50% of the times when Games II and III have been selected and then row-players frequently earn the positive coordination payoff. This result reinforces subjects' interest to become again a row-player and they offer the maximum bid. This over-coordination occurs because action A is chosen by row and column players 80% and 61% of the time respectively. (See Table 4.)

Table 4: Selected game, played action and achieved coordination level.

	Selected game			Row-player's action		Column player's action		% of coordination (Games II and III)
	I	II	III	A	B	A	B	
Round 1	1	3	26	25	10	20	5	93.1
Round 2	3	0	27	25	10	20	5	85.2
Round 3	3	3	24	26	7	23	4	96.3
Round 4	3	1	26	27	12	18	3	70.4
Round 5	4	0	26	26	10	20	4	76.9
Round 6	4	1	25	25	14	16	5	65.4
Round 7	1	2	27	24	16	14	6	58.6
Round 8	2	0	28	20	18	12	10	50.0
Round 9	1	3	26	22	10	20	8	51.7
Round 10	2	0	28	19	9	21	11	67.9
Total	24	13	263	239	61	184	116	71.4

Table 4 also reveals that coordination (both players choosing action A or B simultaneously) decreases along the rounds from 93% in the first round to 68% in the last one. We find the reason looking at column-players' action rows in Table 4, where we can observe that those players increase their randomization in the last periods. A possible interpretation of this fact is that column-players try to punish row-players making coordination less probable. In this way they reduce the row-players' expected payoff, without affecting themselves because payoffs are not shared.

Analysis of subjects' experimental social behavior. After choosing the game, row-players mostly do not share payoffs and, when they do, they share a very small proportion. 62.5% of row-players that chose Game I do not share payoffs, 1.8 units being the average payoff donated to column-players. Similar figures appear for Game II, where 61.5% of the times row-players keep all the payoffs to themselves and, on average, they donate only 1 unit. When Game III is played, the proportion of this unsocial behavior rises to 71.9% and 3.5 units are given to column-players. Furthermore, when Game III is played, Table 5 suggests that in the first periods row-players exhibit a more social behavior, sharing a higher proportion of the payoffs.

Table 5: Average payoff for row-player. Games I, II and III.

	Row-player payoff Game I				Row-player payoff Game II				Row-player payoff Game III			
	A,A	A,B	B,A	B,B	A,A	A,B	B,A	B,B	A,A	A,B	B,A	B,B
Round 1	10,0	10,0	10,0	10,0	19,3	1,7	1,3	13,0	52,5	0,0	0,0	52,5
Round 2	9,3	8,3	9,7	9,0					54,2	0,0	0,0	54,3
Round 3	10,0	7,0	8,0	10,0	17,7	1,3	1,3	14,3	55,1	0,0	0,0	53,0
Round 4	8,7	5,3	9,0	6,7	20,0	2,0	2,0	15,0	57,9	0,0	0,0	58,0
Round 5	7,8	7,8	7,8	7,8					57,2	0,0	0,0	56,3
Round 6	7,0	9,8	8,0	7,8	20,0	2,0	2,0	15,0	57,2	0,0	0,0	55,6
Round 7	10,0	10,0	10,0	0,0	20,0	2,0	2,0	15,0	58,6	0,0	0,0	58,0
Round 8	5,0	5,0	5,0	5,0					56,9	0,0	0,0	59,0
Round 9	10,0	10,0	10,0	10,0	17,3	1,7	2,0	12,3	57,7	0,0	0,0	59,6
Round 10	10,0	10,0	10,0	10,0					59,6	0,0	0,0	57,5
Total	8,5	8,0	8,5	7,9	18,7	1,7	1,7	13,8	56,7	0,0	0,0	56,4

4.4.- Relation between self-perception and experimental behavior

The information provided by subjects' answers to the EIQ and their decisions during the experiment allows for an empirical analysis on the relation between two mirror concepts: self-perception and experimental behavior on entrepreneurial and social attitudes. As stated in our research hypotheses H1 and H2, this relation is expected to be direct.

To test Hypothesis H1, subjects have been divided into two groups according to their Self-perceived entrepreneurial intention (subjects with SEI over and under average). Subjects with SEI over average choose Game III more frequently than those with SEI under average in all the rounds: Game III is chosen by 93% of the former group and 81% by the latter group, and Game I is chosen by 13% and 4% respectively. The non parametric Mann-Whitney test shows that these differences are significant (p-value = 0.002) and so we can accept H1:

H1. There is a direct relation between self-perceived entrepreneurial intention and experimental entrepreneurial behavior

This result justifies the interpretation of subjects' behavior during the experiment (detection of a business opportunity by playing Game III and taking advantage of such an opportunity by investing resources and assuming the risk to play this game) in terms of entrepreneurial behavior.

To proceed with the empirical test of Hypothesis H2, we define four synthetic indicators, one for each dimension of social self-perception, and name each one after its associated dimension. Each indicator is defined as the average of a subject's answers to those items in the corresponding dimension (the association items-dimensions is shown in Table 2). Table 6 shows a descriptive analysis of these four indicators. Additionally, this table presents the percentage of subjects with high social self-perception for each dimension, defined as those subjects whose indicator is greater than 5 (the lowest value of each indicator is 1 and the highest is 7). Notice that at least a quarter of the subjects exhibit high social self-perception for all the four social dimensions. Moreover, around 40% of the subjects present high social self-perception for social responsibility and labor responsibility dimensions.

Table 6: Synthetic indicators of social self-perception.

	Social self-perception					
	Min	**Median**	**Max**	**Average**	**S.D.**	**% of subjects with each social self-perception synthetic indicator > 5 (High social self-perception)**
Social motivation	1.6	4.2	6.9	4.2	1.3	26.7
Social responsibility	1.3	4.5	7.0	4.6	1.4	41.7
Labor responsibility	1.3	4.7	6.7	4.5	1.3	38.3
Indirect social responsibility	2.0	4.0	6.5	4.4	1.1	28.3

We also construct an indicator for the experimental social behavior, named *sharing rate,* for each row-player in each round of the experiment. Sharing rate is defined as the percentage of a row-player's payoff in the coordination game that he or she allocates to the column-player in the corresponding dictator game. It must be remarked that the average sharing rate is just 7%. Table 7 presents the average values of the sharing rate in terms of the social self-perception of the subjects.

Table 7: Sharing rate (percentage of payoff donated to column-player) by level of social self-perception.

	Sharing rate	
	Subjects with each social self-perception synthetic indicator equal or lower than 5 (Low social self-perception)	**Subjects with each social self-perception synthetic indicator higher than 5 (High social self-perception)**
Social motivation	7.5%	4.5%
Social responsibility	6.2%	7.9%
Labor responsibility	6.3%	7.8%
Indirect social responsibility	7.8%	3.8%

A series of non-parametric Mann-Whitney tests shows that we cannot reject the hypothesis that the sharing rate follows the same distribution for those subjects with high and low social self-perception. This result holds in all rounds of the experiment (p-value > 0.05). Thus, there is no empirical evidence of the existence of a relation between social self-perception and experimental social behavior and we cannot accept Hypothesis H2:

H2. There is a direct relation between social self-perception and experimental social behavior.

4.5.- Entrepreneurial attitude and experimental social behavior

We now turn to the comparison between the results of the EIQ and the experiment to test our main research hypothesis H3 and its corresponding sub-hypotheses, which establish that entrepreneurial and social attitudes are compatible.

Table 2 shows that there is no evidence of correlation between self-perceived entrepreneurial intention and any of the four dimensions of social self-perception. We can accept that subjects' social and entrepreneurial self-perception are not related and thus Hypothesis H3a:

H3a. Self-perceived entrepreneurial intention does not lessen social self-perception

As regards the next sub-hypothesis, a series of Mann-Whitney tests support that there is no evidence of relation between the factor of self-perceived entrepreneurial intention and the indicator for experimental social behavior, i.e. the sharing rate, in any round of the experiment[2] (p-value > 0.4). We can then accept sub-hypothesis H3b:

[2]Only the first round Mann-Whitney test reveals a significant relationship between entrepreneurial intention and experimental social behavior (p-value = 0.013). Entrepreneurs are more aware of social

H3b. Self-perceived entrepreneurial motivation does not lessen experimental social behavior

Finally, let us analyze the relation between subjects' experimental entrepreneurial behavior and their social behavior. Following the characterization of an entrepreneur by Peredo and McLean (2006), we define an *experimental entrepreneur* as a subject that, once he realizes the business opportunity provided by Game III, then: (1) he or she invests all his or her initial endowment and bids the maximum (40 ECU) to be able to take advantage of this opportunity; and (2) he or she actually chooses to participate in Game III and to assume the risk involved in playing this game. According to this definition, the results of the experiment show that 19.4% of the experimental entrepreneurs donate part of the payoffs and the sharing rate among donors in this group is 19.8%. These figures are quite different from those exhibited by the subjects that are not experimental entrepreneurs: 49.5% of experimental non-entrepreneurs donated part of their earnings to column-players, the sharing rate among donors in this group being 26.7%. The statistical test reveals that the proportion of donors is significantly different (p-value<0.001) between experimental entrepreneurs and non-entrepreneurs. So, we cannot accept our last research sub-hypothesis:

H3c. Experimental entrepreneurial behavior does not lessen experimental social behavior

5. Final conclusions

This paper analyzes the compatibility between entrepreneurial and social attitudes. Specifically, we analyze if: (1) subjects with a more developed economic entrepreneurial attitude exhibit a less social attitude than other subjects; or (2) social attitude does not depend on subject entrepreneurial attitude. As we presented in Section 4, the answer to this question changes dramatically if a self-perceptional or a behavioral approach is followed. Roughly speaking, if the analysis is performed in terms of subjects' self-perceptions, we can conclude that social self-perception is not correlated with an entrepreneurial attitude, since there is a lack of empirical evidence to reject Hypothesis H3a. However, if this very same analysis is carried out from an economic-behavioral approach, i.e. subjects do not answer hypothetical questions in a questionnaire but participate in laboratory experiments where their decisions are related to actual economic incentives to enhance the possibility of a display of their true behavior, there is clear empirical evidence to conclude that subjects exhibiting a more entrepreneurial attitude during the experiment behave more selfishly than the others. This result is supported by the rejection of Hypothesis H3. An explanation of H3's rejection may be the following: the fact of an entrepreneur investing his or her own resources and assuming the risk to take advantage of a business opportunity makes him her develop a feeling of ownership of the surplus of his or her entrepreneurial activity. As a consequence of this feeling, entrepreneurs are motivated to keep such a surplus for themselves and to behave less socially than others who have made no investment and assume no risk.

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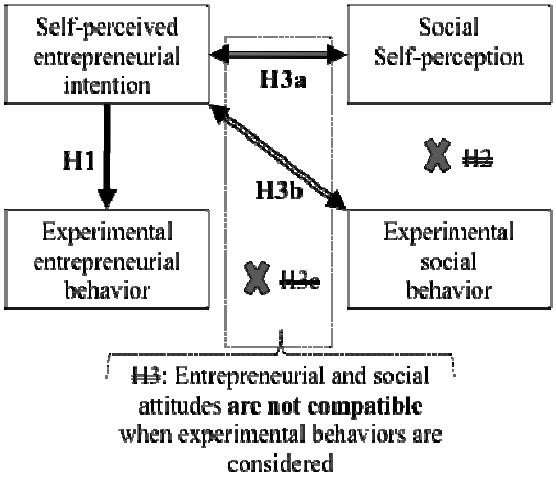
matters than non-entrepreneurs. However, in the remaining rounds this relationship is not significant (p-value>0.4)

Figure 3. Results of the test of the research hypotheses



The empirical evidence to reject Hypothesis H2 could help us to understand why the conclusions under self-perceptional and behavioral analysis are so different. Subjects' social actual behavior in the laboratory does not fit their answers on how they would behave in hypothetical situations where these answers have no real consequences. Two reasons may be considered for such a mismatch. First, subjects may have a wrong social self-perception and consider that they are more social persons than they actually are. Second, since selfishness is not a positive attribute and answers have no actual consequence on their payoff, subjects may prefer to define themselves as more social than they are in order to show a better image of themselves. Notice that this mismatch between self-perception and experimental behavior does not appear in the analysis of entrepreneurial attitude (there is no evidence to reject Hypothesis H1).

A large number of works in the recent literature on entrepreneurs' social attitude and social entrepreneurship are based on the analysis of answers to questionnaires with hypothetical questions on social motivation or behavior. Since this paper shows that empirical evidence may change dramatically if economic behavioral approach is considered, we may conclude that there may be a potential risk of obtaining biased results when data are gathered by questionnaires with no incentive. Specifically, the social attitude of entrepreneurs may be overestimated in published empirical research studies where no actual field or laboratory data are considered.

To the best of our knowledge, this is the first paper considering experimental entrepreneurial behavior, i.e. designing a laboratory experiment to represent the key features of entrepreneurial behavior (detection of a business opportunity, and endowment investment and risk-taking to get an advantage from the opportunity). This first research exhibits some important limitations that should be considered in further research. For instance, the sample size is only 60, and considering actual entrepreneurs, with field experiments for instance, should enrich the profile of the subjects. Finally, the analysis of the actual social behavior of a sample of entrepreneurs after launching their entrepreneurial projects would help to enlighten the conclusions of the paper.

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