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Looking at Creativity from East to West: Risk Taking and Intrinsic Motivation in Socially and Culturally Diverse Countries*

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Abstract

This article presents a mixed-methods research in the field of creativity. By making use of experiments and a questionnaire, it analyses how creativity is affected by three factors: i) motivation, ii) individuals' attitudes towards risk and ambiguity and iii) social context. Each one of these factors has been extensively investigated in the theoretical and empirical literature getting to results still open to discussion. In particular, this research focuses on two aspects. First, we try to shed some light on the controversial findings linking risk taking and creativity that exist in the economic and psychology literature. To do so, we test the hypotheses that self perception of creative abilities may play a role in establishing a risk-creativity positive correlation. Second, being the three factors strongly influenced by culture, the study investigates whether the impacts on creativity may differ in diverse geographical locations. Following Attanasi et al. (2019), we exploit data from experiments performed in main cities of one eastern and one western country: Ho Chi Minh city (Vietnam) and Strasbourg (France). The information to build the risk and ambiguity factor derive from risk and ambiguity elicitation via lotteries. To account for motivation, different organizational scenarios are set in experimental treatments (financial incentives vs non financial incentives to collaborate). Finally, information on social context and self perception of creative abilities are collected through a self administrated questionnaire. In our analysis, we find that risk aversion, social habits and leisure activities have a positive effect on the creative performance of the French participants, while for Vietnamese the intrinsic motivation and the perception of their own creative capacities are positive correlated with creative scores. Our results suggest that in a country like France, social context has a strong influence on individual creativity, while for Vietnam individual features play a role in creativity, suggesting that the socio-cultural context has different impacts on creativity.

Keywords: experiments, risk, ambiguity, self-perceived creativity, motivation, geographical location, social context.

JEL codes: I23, O31, O32.

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1 Introduction

In economics, the tale of the origin of ideas, what determines their formation and growth, as well as the different obstacles they have to overcome in order to replace the status quo, has been largely neglected. However, in the recent years, creativity, which is a fundamental part of this tale, has gained importance in the literature addressing economic growth and development (Aghion and Howitt, 2008; Phelps, 2013). At a macro scale, creativity is an important economic input that strongly shapes technological change (Mokyr, 1992) while at a micro level, encouraging creativity may have the side effect of increasing well-being and self-determination of individuals (Dolan and Metcalfe, 2012; Ryan and Deci, 2000).

With this background, this paper analyses creative performances by focusing on three geographically-varying elements: i) how risk and ambiguity aversion affects individual creativity?; ii) how motivation affects individual creativity?; and iii) how social context affects creativity and the first two elements? To answer these questions we have used data from Attanasi et al. (2019) in which authors combined experimental methods with insights from economic geography.

From a psychological point of view, creativity has been seen as an innate feature of individuals, while from a social perspective, it is acknowledged that many external factors can influence it. A relevant part of the literature dealing with creativity recognizes the role that individual characteristics, such as genetics, divergent thinking and cognitive development, play in fostering it (Caniëls, 2004). Among it, several studies focus in particular on the importance of innate risk and ambiguity aversion (Stenberg and Lubart, 1991) and on motivation (Ambrose and Kulik, 1999).

In this paper we argue that risk aversion and motivation are not only personal characteristics of individuals, but they are affected by the social context. Moreover, we argue that the role of self perception of creative abilities might play a role so far widely neglected. Finally, we argue that different geographical locations may embed different values and habits such as to forge individuals' (risk/motivation/social) attitudes in different ways.

Our arguments are originated in a multidisciplinary literature.

For motivation, it may be tempting to take the view that creativity is an important economic input and thus, is driven by economic rationales. Nevertheless, much research from the psychology literature suggests that motivation to be creative is primarily intrinsic (Amabile et al., 1996). In other words, people cannot be economically solicited or coerced

into being more creative; at most, people can be more or less creative in response to the social environment that they inhabit. This implies that, in order to stimulate creativity, optimal external conditions must be established. In this perspective, social context would be a primary driver of the creative process in line with the notion of *creative milieu* (Hall, 2000), an important component of the wider range of creativity literature.

For risk, the economic literature vastly agrees that the more risk lover the more creative, but other domains are less definitive about this result. Psychologists report controversial findings about the link between creativity and risk attitudes, and many describe risk taking as a unstable variable that is not innate but is shaped by context. The anthropologist Mary Douglas (2013) argued that how people perceive and react to risks cannot be explained by personality or preference ordering: decisions under risk are governed by socially embedded values and beliefs.

The psychology and anthropology literature also give ground to the hypothesis that an important characteristic of creative individuals (with a consequent influence of risk attitudes) is related to the awareness of possessing creative skills.

Seeking to take into account these contextual aspects, we study the impact of different external factors which may affect individuals' performance when they are asked to accomplish creative tasks. Hence, the external factors are threefold, and are divided into: i) economic-related motivators, which we observe via different incentives in experimental treatments; ii) risk and ambiguity aversion, elicited through lotteries and; iii) social-related factors, caught via interviews. The geographical dimension has been observed by varying the country in which the data have been collected.

To deal with the latter, we have followed the approach of Strauss (2008) about how to compare two different contexts in a controlled natural experiment. Her suggestion is to choose an institution with limited international presence, with at least two branches having different geographical locations (two geographic areas quite distant in at least one characteristic), and then compare whether a similar task run in both locations leads to different results. The institution we have chosen for our research is the French University. More precisely, we have run experiments in the faculty of economics of the PUFs (Pôles Universitaires Français) of Ho Chi Minh and at the University of Strasbourg. We proposed to both subject pools (120 students in the first location, the PUF of Ho Chi Minh, 120 students in the second location, at the University of Strasbourg) the same experimental

tasks, meant to elicit their creativity.

The paper is organized as follows: Section 2 provides the background and hypotheses, Section 3 describes the methodology, data analysis and variables' construction, Section 4 contains the results of the empirical estimations and discusses them. Section 5 concludes the article.

2 Background and hypotheses

During the last century, creativity has been studied from different perspectives by scientists working in several fields. Many of them have provided a slightly different definition of creativity along the years, although the majority agrees on defining creativity as the ability to do new things which have some utility (Amabile, 1996).

For many years creativity has been kept outside the economic domain, as it were a topic linked exclusively to the innate nature of individuals and intrinsic motivations, thus unresponsive to any financial or organizational incentive. During the second half of the XX century, scientists have developed numerous methods to capture creativity (Torrance, 1988) and used a variety of proxies, mainly related to business success, research productivity and prize winning. In this paper we rely on the work of Attanasi et al. (2019) in which creativity has been captured by means of a field experiment.

In this paper we study the impact of different factors on individuals performance when they are asked to accomplish creative tasks. The factors are threefold: i) motivation, ii) risk and ambiguity attitudes and, iii) social context.

2.1 Motivation

Creativity is a multifaceted phenomenon. The economic, sociology, organizational anthropology and psychology literature is filled with attempts to grasp the antecedents of creativity. In this plethora of endeavors, two are the main approaches used to disentangle creativity's determinants: individual vs group creativity and intrinsic vs extrinsic motivation.

In regard of the first aspect, the literature mainly agrees on recognizing a superiority of the group in generating creative ideas, which come from joint thinking, meaningful conversations and confrontation (John-Steiner, 2000). An extreme position is represented by scholars arguing that individual creativity simply does not exist because individuals are influenced by

others even when they generate ideas in solitude (Glăveanu and Tanggaard, 2014). On the other hand, researchers playing in the opposite field have displayed similar sharp positions by claiming that creativity is a solo act even when accomplished in group. According to this point of view, scholars fostering supremacy of group creativity are confounding the act of spreading the idea to others via interactions with the act of co-creation (Laudel, 2001).

Although the literature still leaves room for discussion, economists tend to focus mainly on group creativity while acknowledging that individual creativity is fundamentally a matter of endowments of human beings that can be influenced effectively only during infancy (López-González, 2015; Feist, 2010).

On the contrary, the debate on intrinsic vs extrinsic motivation find fertile ground in the economic and organizational literature, being extrinsic motivation primarily driven by monetary incentives and external recognition of success (such as career advancements) and intrinsic motivation partially influenced by organization.

Insights from behavioral economics suggest that intrinsic motivators play a dominant role in affecting creativity because they draw attention on the creative task solely. Intrinsic motivators include curiosity, passion, self-realization, sense of duty and many others (Golann, 1963; Amabile, 1983; 1985; Staw, 1989).

Even though for some authors intrinsic and extrinsic motivation have a cumulative effect, the majority argues that extrinsic rewards kill creativity by transforming the creative effort into a mean to an end. According to this point of view, while performing a creative activity, people facing the possibility of an extrinsic reward tends to subtract attention from the task to re-direct it towards the final goal (Deci, 1971; Deci et al., 2001, Frey and Jegen, 2001; Lazaric and Raybaut, 2014). In this regards, for economists is quite hard to accept the possibility that money and recognition can disincentive economic agents but the argument and the empirical conclusions in favor of this position are quite powerful (Owan and Nagaoka, 2011; Hennessey and Amabile, 1998; Amabile, 1998; Kreps, 1997).

If people cannot be economically incentivized to be “more creative”, affecting creativity become a matter of organization.

In our analysis we discriminate between intrinsic and extrinsic motivation to observe the impact on the level of creativity displayed by the participants to the experiment. In line with Benabou and Tirole (2006) and Eisenberger and Shanock (2003) we expect participants of the experiment to show higher levels of creativity in the scenario where organization is

intended to enhance intrinsic motivation.

2.2 Social context

As clarified in the previous sections, we can find antecedents of creativity in many domains of science. However, it has been widely acknowledged that individuals role as change agents has been ignored in studies of regional development (Asheim and Hansen, 2009) and that “there is a need to integrate the importance of place for individual creativity into this emerging theory” (Drake, 2003:511). As well expressed by Scott (2010:119), the notion of creativity is inevitably caught between two polarities: “On the one side, creativity resides in the personal endowments and capacities of individual subjects. Some individuals have the native talent and/or acquired know-how for certain kinds of creative acts; some have little or none. [...] On the other side, creativity is also embedded in certain social contexts that shape its motions and objectives in many different ways” (See also Sternberg and Lubart, 1991 for the former and Csikszentmihalyi, 1990; Seitz, 2003; Hemlin et al., 2008; Zimmermann, 2008 for the latter).

Hence, in our analysis we try to identify individuals social identity to observe any possible relationship with creativity. We share our research objective with Scott (2010) – i.e. to consider the reflexive interactions between individual expressions of creativity and the social milieu – but, differently from his dominant reference to the latter, we try to empirically merge the two by both objectively measuring the individual level of creativity and qualitatively assessing the effect of context on it. Furthermore, we analyze whether the attributes of the local context captured in different geographical locations has an impact on individual creativity.

In particular, we consider the following dimensions of the social context for which we expect a positive relationship with creativity.

Individual perception of living in an open-minded and tolerant city, in addition to cultural vitality and sense of liveliness (“the place to be”, see Boschma and Fritsch, 2009). This has been defined as “buzz” (Drake, 2003; Asheim and Hansen, 2009) of a place - the system of leisure opportunities and amenities providing some forms of recreation (Scott, 2010). Buzz is assumed to play a vital role in fostering creativity and in having an impact on the presence of the creative class in a region. In our research we suppose that (and test if) the same factors can influence the individual creative capacity of people.

According to Scott (2010:119), creative thinking is influenced by individuals' knowledge and skills, which are acquired through "education, practice and informal socialization", that is, from external sources that are themselves permeated with definite historical and geographical character.

Creativity is also a form of cultural expression and one of the most illustrative forms of cultural participation: engaging with cultural artifacts to produce new ones (Glăveanu, 2010). According to Glăveanu, to participate in culture means both to engage with existing cultural elements and to contribute to their transformation, both key processes of creative expression. Therefore, being a member of a cultural association can be considered as a form of cultural participation.

Creativity does not happen solely inside a person's head but in the interaction between a person's thoughts and a sociocultural context (Engeström, 2001). In fact, scholars have individuated a link between extroversion, openness to experience, agreeableness and creativity at the individual level (Batey and Furnham, 2006). Specifically, studies have shown that creative achievement is closely related to high levels of extroversion (Stafford et al. 2010) and openness to experience (McCrae 1987; Steel et al. 2012). Therefore, we expect that social activities that involve social relations such as going out, meeting with friends, or performing activities in groups, may enhance creativity.

Social context is intrinsic to social capital, being a potential resource for acquiring cooperation from other members, as it establishes a sense of trust and a positive atmosphere for contribution (Fischer and Williams, 2004). According to Fischer and Williams (2004), the relational dimension of social capital (generalized reciprocity, shared norms and values of the community, mutual trust among members, and identification with the community, see Nahapiet and Ghoshal (1998)) provides a framework to assess the roles that motivation and trust play in fostering social creativity. Hence, individuals perception of belonging to a more trust society is positively related with higher degrees of creativity.

Florida shows a strong association between the CCV ("Creative Class Values - the leading force at the beachhead of social, cultural, and economic change who share a common creative ethos that values creativity, individuality, difference, and merit" (Florida, 2002:8)) and openness towards gays and ethnic and racial minorities across nations (see Mellander et al. 2011). People tend to be relatively tolerant towards other groups and in favor of gender equality, which is very much in line with CCV. In every form of values, from sexual norms

and gender roles to the degree of environmental protection, Inglehart (2000) also finds a continued movement away from traditional norms to more progressive ones. Furthermore, as economies grow, living standards improve and people grow less attached to large institutions; they become more open and tolerant in their views about personal relationships (see p. 60 in Florida, 2002).

Last but not least, the geographic context can play a role in determining individuals' behavior. Anderson et al. (2004) among others suggest that individuals in non-Western countries may respond differently than those from Western nations. In addition, different levels of economic and social development can also influence individuals' behavior and social perceptions.

2.3 Risk and ambiguity aversion

A vast multidisciplinary literature focuses on individual risk attitudes and creativity and two main and opposing approaches can be quoted. In Economics we find a general consensus on an alleged positive relationship between risk taking and creativity, while in the non economic literature many scholars point at a different direction.

In Economics, many authors agree that creative people possess specific attributes, in particular, they are described as risk takers (Carver and White, 1994; Keltner et al., 2003; Lee et al., 2004; Mainemelis, 2010). Sternberg and Lubart (1991) elaborated a theory in which being creative is comparable to being hazardous investors able to exploit different resources to reduce risks. Elaborating on the same line, authors agree on the key role that risk aversion play in determining creativity. Many of them claim that the higher the risks, the more radical the creativity (Benner and Tushman, 1993; Smith and Tushman, 2005) and that sharing risks with a group of people enhances creativity (Glover, 1977).

A relevant part of the non-economics literature dealing with creativity recognizes the role that individual characteristics, such as genetics, divergent thinking and cognitive development, play in fostering it (Caniëls, 2004). Creativity depends on personality characteristics related to self-discipline, the ability to delay gratification, perseverance in the face of frustration, independence, absence of conformity in thinking and independence on social approval (Feldman, 1994; Golann, 1963; Hogarth, 1980; Stein, 1974). However, they point out that risk taking attitudes is not just a trait of individuals, but are shaped by context. The anthropologist Mary Douglas (2013) argued that risk perception cannot be explained by

personality, rather by socially embedded values and beliefs.

Beyond agreeing on the positive relations between risk and creativity, economists have emphasized that risk attitude is a stable component of individual behavior and that choices are not affected by contexts (Dohmen et al. 2011; Einav et al. 2012; Viedier et al. 2015). On the other hand, among psychologists there is a general consensus that risk attitudes are context-specific and that risk choices in different contexts are poorly correlated (Weber, Blais, and Betz 2002).

Although it has gained much less attention than risk, ambiguity attitudes have also been analyzed in the context of creativity. For ambiguity, the literature findings are less controversial and generally in line with economists' findings on risk and creativity. Several studies show that ambiguity loving is related to creativity in problem-solving tasks (see Sternberg and Lubart 1991, Zenasni et al. 2008). Csermelv and Lederman (2003) stated that ambiguity loving is fundamental in scientific domains. In contrast, when ambiguity aversion is influenced by extrinsic incentives, Charness and Grieco (2019) found a negative influence on creativity in open tasks, not obtaining any significant result for closed tasks, although results show some detrimental effect on creativity. Using a sample of engineering students, Toh and Miller (2016) found that teams with a higher acceptance of ambiguity are more prone to select more novel (creative) concepts. Baer et al. (2007) also showed that new and original ideas tend to be viewed with skepticism in team settings, likely discouraging the selection of these ideas. On the other side, teams which are more comfortable with making decisions under uncertainty and that, are more willing to select ideas with unknown parameters are more likely to engage in the creative process (Bradshaw et al. 1999; Camacho and Paulus 1995).

In the literature of creativity, authors suggest there is a positive correlation between acceptance of ambiguity and individuals creativity (see Barron and Harrington, 1981; Golann, 1963; Sternberg and Lubart, 1995; Urban, 2003). Zenasni et al. (2008) measured acceptance of ambiguity by participants judging ambiguity among a large set of stimuli (images and verbal material) using a five-point Likert scale. Using a sample of parents and children, they found a positive correlation between acceptance of ambiguity and creativity. However, no significant links between parents acceptance of ambiguity and their adolescents acceptance of ambiguity or creativity was found.

By analysing the literature on risk and creativity and ambiguity and creativity in different

domains, it is possible to realize that the phenomena is much more complicated than a linear relationship. In the following sub paragraphs we present an attempt to enlarge our vision by embedding into the analysis an unexplored point of view.

2.3.1 The self-perception of creativity

As mentioned above, several studies indicate that there is a positive correlation between intrinsic motivation and creativity, although little attention has been given to the functioning of such relationship. Recently, scholars have focused on two distinct subjects: the confidence of individuals about their self-efficacy and the self-perception of creative abilities.

Creativity has been explored inside the self-efficacy literature, a domain that investigates confidence of individuals about their own effectiveness on tasks (e.g. Bandura, 1997; Tierney and Farmer, 2002; Jaussi et al., 2007). According to some authors, being conscious of its own effectiveness on creative tasks plays a key role in reinforcing the ‘creative-role-identity’, producing tangible effects over individuals behavior (Farmer et al., 2003). Of great interest is how the creative-role-identity affects motivation and the seeking of certain tasks (Bandura, 1986). Stryker (1980) and Prabhu et al. (2008) state that when an individual believes in his or her capability, this mobilizes his or her motivation, especially intrinsic motivation. In an interesting theory, Harter (1978) indicates there is a relation between individuals performance in a particular task and intrinsic motivation, being success positively associated to intrinsic gratification. In essential agreement with Harter, a number of social-psychological theorists (e.g., deCharms, 1968; Deci, 1971; Lepper and Greene, 1978) have proposed that success (confirmation of competence) leads to increased intrinsic motivation.

Regarding the second domain, scholars explored the possibility that creativity may be influenced by their own perception of their own creative potential (Farmer 2003; Tierney and Farmer 2002). According to Hinton (1968, 1970), self-perceived creativity is defined as the self-perceived “creative capacity, skills and abilities that the individual possesses” (cited in DiLiello and Houghton, 2008, p. 39 and Laguia et al., 2019 p. 45). Several studies have demonstrated that people that perceive themselves as creative individuals, are indeed creative (e.g., Barron and Harrington, 1981; Farmer, 2003). Furthermore, it has been suggested that self-perception may enhance creative performances (Fisher, 1997; Petkus, 1996; Amabile et al., 1996), especially in organizational environments (Amabile, 1988).

A further insight that may help in disentangling the relationship between creative identity and creative abilities comes from the cultural self-representation theory of Earley (1993). In this theory, identity is extended by considering cultural elements as predictors because, according to the authors, culture can affect the processes leading to the construction of the self-concept. Although the previous literature on self-perceived creativity are not culture-dependent, the self-representation theory gives reasons to expect differences between French and Vietnamese participants.

Hence, the self-perceived creative concept may be of a particular relevance for understanding creativity in different social/geographical/organizational contexts, and might help to shed light on the controversial relationship between risk taking and creativity.

On the basis of previous findings, where creativity has positively been related to individual attitudes towards willing to take risk, self-perceived creativity and self-efficacy, and both of them to intrinsic motivation and context-specific, we develop the following context specific hypotheses:

- H1 A positive relationship should link self-perception/efficacy on creativity and creativity itself.
- H2 The aforementioned relationship should be stronger in a context where intrinsic motivation is elicited.
- H3 A positive relationship between risk loving and creativity should be observed for people characterized by self-awareness.

3 Methodology

The information exploited in this research comes from an experiment described in Attanasi et al. (2019), and we refer to their article for an exhaustive presentation of the experimental design and the questionnaire used to collect the data.

The experiments were conducted in two different universities in France and Vietnam between April 2015 and May 2016 with a total of 240 students enrolled. All the experiments have been carried out in English, with Vietnamese and French speaking helpers to cope with some possible misunderstanding in the interpretation of the instructions.

There were three phases in the experiment, the first one intended to capture student's creativity in performing a task with different motivations, the second one intended to record

their risk and ambiguity attitudes through lotteries, and a third one intended to collect information about the social context.

In the following paragraphs we present in detail the variables and how they have been built.

3.1 Dependent variable

The first phase allow us to build the dependent variable, *creativity*, which is the score obtained by participants for their creative performance. Following Amabile (1982), and Charness and Grieco (2019), the variable *creativity* is the average score that four independent judges gave to the creative performance of the students taking part into the experiment. The four judges are necessary in order not to lose one of the essential characteristics of creativity according to Amabile: creativity has to be identified individually but by more than one appropriate observer (Amabile, 1982). Besides, no guiding definition of creativity was provided, as it is something that people can recognize by themselves (Amabile, 1982; Barron, 1965). Each task was evaluated at a scale of 1 – 10, being 1 the score representing the least creative task and 10 the most creative task.

As specified by Attanasi et al. (2019), the four external judges (two males, two females; two graduate students, two Ph.D. candidates) blind to treatments and conditions, separately received a Dropbox folder invitation with the tasks. To avoid biases due to accustomedness, the sheets were scanned in a random order and subsequently identified by a sequential number and then, two referees have been asked to evaluate the task in ascending order and two in descending order. Table 1 provides information about the Cronbach Alpha test for the consistency of evaluations among the four judges that exhibited a very good degree of correlation (Cronbach’s alpha = 0.7787).

Judges	item-test corr	item-rest corr	Av	interitem corr	alpha
Judge 1	0.7535	0.5483		0.4905	0.7428
Judge 2	0.8379	0.6865		0.4033	0.6697
Judge 3	0.7371	0.5229		0.5075	0.7556
Judge 4	0.7726	0.5784		0.4708	0.7274
Test scale				0.4680	0.7787

Table 1: Alpha Cronbach coefficients for judges’ scores.

3.2 Explanatory variables

Risk / ambiguity

After the creative task, in Phase 2, we measure risk and ambiguity attitudes by means of two incentivized questions (Gneezy and Potters 1997; Charness and Gneezy 2010). In the first task, participants had to make an investment choice of the unknown award for the previously performed task. In particular, they had to indicate an amount from 0% to 100% of their award knowing that there are 50% chances of receiving 2.5 times the invested amount and 50% of losing the invested amount.

From this task, we create the dummy called *low_risk*, which is 1 for those participants that selected a percentage lower than 50% of their unknown reward and 0 otherwise. This procedure provides a measure of risk aversion for each individual.

The question of ambiguity attitude was identical. However, participants did not know the probabilities of winning or losing their investment.

From this task, we create the dummy variable *amb_aversion*, which is 1 for those participants that selected a lower percentage of investment at the ambiguity question than in the risk question, and 0 otherwise. This procedure provides a measure to identify ambiguity averse subjects.

Social context

At the end of the experiment, we interviewed participants to detect their social identity. In doing so, we asked questions about:

- Demographic characteristics (gender, age, origin, place of residence, education, job)
- Social habits (how often they meet known or new people; how often they go to cafes, bar, pubs)
- Leisure habits (how often they do new things; how often they go to theater, cinema, concerts; how often they go out in the evening)
- Tolerance and openness (how many foreign friends they have; do they frequent places where immigrants usually go; are they tolerant towards homosexual people)
- Self-perceived creativity (would they define themselves as creative, definition of creativity)

- Social capital (do they think that most people can be trusted; how much do they trust people in general (0 – 10 scale)); does a person (they do not know) for the fact of being from “x city” deserves to be trusted more than another one they do not know and who does not live in town?
- Self-perceived tolerance (do they think they live in a tolerant city)
- Member of a cultural association (Yes – No and mission of the association)
- City facilities (do you think you live in a city which offers a wide set of amenities and chances for entertainment).

In terms of social aspects, we include the following variables of study:

sp_generalised_trust: Self-perceived generalized trust: We ask participants if in general they think that most people can be trusted (1) or distrust is better (0). This variable measures the level of generalized social capital or trust that the participants feel in their city.

sp_tolerance: Self-perceived tolerance. We ask participants if they think that the city is tolerant (1) or not (0) to account for the perception of participants about the general level of tolerance in the city.

Homosexual_friends: Homosexual friendship. We ask participants if they have homosexual friends (1) or not (0). This can be considered as a variable to measure openness to different sexual orientations of individuals.

Member_cultural association: Member of a cultural association. In order to account for cultural participation, we ask participants whether they belong to any cultural association (1) or not (0).

Dleisure: Leisure activities. We ask participants how often do they go to the cinema, theater or to concerts. We identify those agents that indicate that they attend at least two or three times a week with 1 (0 if they attend once a month or less than once a month).

Dsocial: Social activities. We ask participants how often do they meet their friends in their free time and how often do they go out in the evening. We identify those agents that indicate that they go out and meet their friends at least two or three times a week with 1. Those who responded to both questions saying once a month or less than once a month are identified by 0.

Motivation

sp_creativity: Self-perceived creativity. We ask participants, after performing the creative task and being asked about their risk and ambiguity attitudes, whether they define themselves as creatives (1), no (2) or they do not know (3). This variable values 1 for those who answered this question affirmatively and 0 otherwise.

t_intrinsic: Intrinsic treatment. A dummy was introduced for those participants who were paid according to the intrinsic treatment (1), (i.e. participants were able to interact with other participants of their group but no monetary incentive was given to cooperate), 0 otherwise (i.e. individual payoff without cooperation, cooperative payoff and cooperative and competitive payoff).

Controls variables

The control variables that we use in our model are the following: *Gender*: 0 when is male and 1 when is female.

Origin: 1 if the participant is originally from Strasbourg/Ho Chi Minh and 0 otherwise.

4 Results and discussion

Table 2 and Table 3 show descriptive statistics for Vietnam and France, respectively.

Variables	N	mean	sd	min	max
Creativity	120	5.842	1.577	2	9.500
Origin	120	0.542	0.500	0	1
sp_tolerance	120	0.600	0.492	0	1
Member_cultural_association	120	0.125	0.332	0	1
Homosexual_friends	120	0.733	0.444	0	1
sp_generalised_trust	120	0.467	0.501	0	1
Dleisure	120	0.0667	0.250	0	1
Dsocial	120	0.683	0.467	0	1
T_intrinsic	120	0.250	0.435	0	1
Amb_aversion	120	0.483	0.502	0	1
Lowrisk	120	0.467	0.501	0	1
sp_creativity	120	0.525	0.501	0	1
Gender	120	0.692	0.464	0	1

Table 2: Summary Statistics for Vietnam

Variables	N	Mean	sd	Min	Max
Creativity	120	5.713	1.449	1.250	8.750
Origin	120	0.333	0.473	0	1
sp_tolerance	120	0.883	0.322	0	1
Member_cultural_association	120	0.125	0.332	0	1
Homosexual_friends	120	0.567	0.498	0	1
sp_generalised_trust	120	0.650	0.479	0	1
Dleisure	120	0.125	0.332	0	1
Dsocial	120	0.758	0.430	0	1
T_intrinsic	120	0.250	0.435	0	1
Amb_aversion	120	0.483	0.502	0	1
Lowrisk	120	0.458	0.500	0	1
sp_creativity	120	0.358	0.482	0	1
Gender	120	0.492	0.502	0	1

Table 3: Summary Statistics for France

Table 4 shows correlations among the variables. No missing values were found. The correlation matrix exhibits values among -0.205 (low_risk vs dsocial) to 0.226 (dleisure vs dsocial), showing the absence of multicollinearity.

Dependent variable

Creativity evaluation

We first evaluate the consistency of evaluations among the four evaluators in charge of scoring the different tasks. As shown in Table 1 the Cronbach alpha test exhibits a very good degree of consistency among the four scores (Cronbach's alpha coeff.= 0.7787). Therefore, we use the average of the four evaluators as our measure of creativity. By country, we find that creativity scores between France and Vietnam are not statistically different, with average of 5.71 and 5.84 , respectively (z=0.948, p=0.343, ranksum-test).

Explanatory variables

Risk

As explained in the methodology section, in Phase 2 participants were involved in a risk task in order to elicit their preferences for risk (i.e. participants were considered as low_risk if the percentage invested was lower than 50% of their payoff).

Both in France and Vietnam, a majority of participants (65 vs 64, respectively) in-

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
creativity (1)	1												
low_risk(2)	0.154*	1											
sp_creativity (3)	0.156*	-0.101	1										
amb_aversion(4)	0.0448	-0.0109	0.0465	1									
t_intrinsic(5)	0.133*	0.121	0.00969	0.0963	1								
gender (6)	0.109	0.0565	0.00484	0.176**	0.0489	1							
origin (7)	-0.0297	0.0242	0.0782	-0.0126	0.0145	-0.0192	1						
member_cultural_association (8)	0.187**	0.0284	0.222***	0.0378	0.0727	0.00641	-0.0286	1					
homosexual_friends(9)	0.174**	-0.0377	0.125	0.115	-0.0403	0.190**	0.154*	0.119	1				
sp_generalised_trust (10)	0.0618	-0.117	-0.104	0.0375	-0.0484	-0.00484	-0.0106	0.0317	0.0158	1			
sp_tolerance (11)	-0.104	-0.178**	-0.0310	-0.0578	0.0110	-0.103	-0.0360	0.0216	-0.174**	0.0502	1		
dsocial (12)	0.100	-0.205**	0.0672	0.0257	-0.0697	-0.158*	0.0246	-0.0456	0.147*	0.101	0.206**	1	
dleisure (13)	-0.0419	-0.101	-0.0565	-0.146*	-0.0854	-0.0984	-0.107	0.0419	0.0737	0.0379	0.139*	0.226***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Correlation matrix for all the variables

vested at least 50% of their payoff in the risk lottery. In France, there is a significant and positive relation between the creativity performance of participants and investing low risk percentages (spearman rho coeff.=0.2378, p=0.0089; t-coeff.=-2.978, p=0.003, two-tailed test; z=-2.594, p= 0.009 ranksum-test). In the case of Vietnam, there is no significant relation between risk and creativity (spearman rho coeff.=0.0319, p=0.7296; t-coeff.=-0.5629, p=0.5746, two-tailed test; z=-0.348, p=0.728 ranksum-test).

Ambiguity

In addition to the risk question, ambiguity attitudes of participants were also elicited (i.e. participants were considered ambiguity averse if the percentage invested in the ambiguity question was equal or lower than the percentage invested in the risk question). Both in France and Vietnam, 58 participants in each country showed ambiguity-averse attitudes. In France, no significant relation was found between the creativity performance of participants and being ambiguity-averse (spearman rho coeff.=0.0321, p=0.7279; t-coeff.=0.0408, p=0.9675, two-tailed test; z=-0.350, p=0.726 ranksum-test). In the case of Vietnam, no significant relation is also obtained (spearman rho coeff.=0.0718, p=0.4355; t-coeff.=-0.9764, p=0.3309, two-tailed test; z=-0.784, p=0.433 ranksum-test).

Intrinsic treatment

Both in France and Vietnam, the number of participants in the intrinsic treatment (treat_intrinsic) was equal (30 in each country). When we summarize creative scores by treatments, differences among eliciting motivation and geographical context emerge. In France, for those participants with the possibility to cooperate with other members of the group although obtaining a payoff depending on their own task (i.e. intrinsic treatment), no relation was found between intrinsic motivation and creativity (spearman rho coeff.=0.0475, p=0.6205; t-coeff.=-0.3079, p=0.7589, two-tailed test; z=-0.498, p=0.6184 ranksum-test). Conversely, Ho Chi Minh students responded positively to intrinsic motivation incentives (spearman rho coeff.=0.2271, p=0.0126; t-coeff.=-5.5638, p=0.0166, two-tailed test; z=-2.477, p=0.0133 ranksum-test).

Self-perceived creativity

We asked participants whether they define themselves as creative or not (sp_creativity). With reference to this, we found country differences since only 35.8% (43 students) in France considered themselves as creatives, in contrast to a 52.5% (63 students) in Vietnam. In France, no relation was found between creativity perception and creativity (spearman rho

coeff.=0.0724, p=0.4319; t-coeff.=-0.7029, p=0.4835, two-tailed test; z=-0.790, p=0.4296 ranksum-test). Conversely, there is a significant and positive relation between Ho Chi Minh students' perception of creativity and their performance (spearman rho coeff.=0.2393, p=0.0085; t-coeff.=-2.5453, p=0.0122, two-tailed test; z=-2.611, p=0.0090 ranksum-test).

Self-perceived generalized trust

We asked participants whether they thought that most people can be trusted or not (sp_generalised_trust). We found differences between countries since 65% (78 students) in France answered affirmatively, in contrast to a 53.3% (64 students) in Vietnam which claimed it is better to distrust people. In France, no relation was found between social capital and creativity (spearman rho coeff.=0.0452, p=0.6237; t-coeff.=-0.2680, p=0.3128, two-tailed test; z=-0.494, p= 0.6216 ranksum-test). Similarly, no significant relation was found in Vietnam (spearman rho coeff.=0.0167, p=0.8566; t-coeff.=-0.5629, p=0.5746, two-tailed test; z=-0.182, p=0.8558 ranksum-test).

Self-perceived tolerance

We asked participants whether they perceive that they are living in a city that can be considered tolerant (sp_tolerance). We found differences between countries since 88.3% (106 students) in France answered affirmatively, in contrast to a 60% (72 students) in Vietnam. In France, there is a significant and negative relation between self-perceived tolerance and creativity (spearman rho coeff.=-0.2002, p=0.0284; t-coeff.=2.0427, p=0.0433, two-tailed test; z=2.183, p=0.0290 ranksum-test). In fact, 12 out of the top-14 performing over the average (5.71) perceived the city as no tolerant. Conversely, no significant relation was found in Vietnam (spearman rho coeff.=-0.0332, p=0.7188; t-coeff.=0.4828, p=0.6302, two-tailed test; z=0.362, p=0.7172 ranksum-test) .

Homosexual friendship

We asked participants whether they had friends with different sexual orientation (homosexual_friends). We found differences between countries since 56.7% (68 students) in France answered affirmatively, and 73.3% (88 students) also did in Vietnam. In France, there is a significant and positive relation between having homosexual friends and creativity (spearman rho coeff.=0.1929, p=0.0348; t-coeff.=-1.9681, p=0.0514, two-tailed test; z=-2.104, p=0.0353 ranksum-test). Besides, we observe also a significant and positive relation for Vietnam (spearman rho coeff.=0.1727, p=0.0592; t-coeff.=-1.7737, p=0.0787, two-tailed test; z=-1.884, p=0.0595 ranksum-test) .

Member of a cultural association

In order to account for active participation in cultural activities, we ask participants whether they were members of any cultural association (*member_cultural_association*). In both countries, only 15 students (12.5%) agreed. In France, there is no significant relation between being a member of a cultural association and creativity (spearman rho coeff.=0.1261, $p=0.1699$; t-coeff.=-1.3497, $p=0.1797$, two-tailed test; $z=-1.376$, $p=0.1689$ ranksum-test). Among the 15 French students who agreed on being part of a cultural association, 9 performed over the average in France (5.7). Conversely, for Vietnam students, we obtain a significant and positive relation (spearman rho coeff.=0.2503, $p=0.0058$; t-coeff.=-2.7644, $p=0.0066$, two-tailed test; $z=-2.730$, $p=0.0063$ ranksum-test). Among the 15 Vietnamese students that agreed on being members of a cultural association, 13 of them performed over the average in Vietnam (5.84).

Leisure Activities

Another variable to account for participants' cultural activities involves the frequency of attending cinema, theater or concert activities (*d_leisure*). In France, 32.5% of students (39 students) declared going at least 2/3 times a week, whereas in Vietnam the percentage falls to 24.16% (29 students). In France, there is no significant relation between attending this kind of activities and being creative (spearman rho coeff.=-0.0942, $p=0.3061$; t-coeff.=0.9799, $p=0.3299$, two-tailed test; $z=1.028$, $p=0.3041$ ranksum-test). Similarly, no significant relation is found for Vietnam (spearman rho coeff.=-0.0205, $p=0.8237$; t-coeff.=-1.1470, $p=0.8834$, two-tailed test; $z=0.224$, $p=0.8227$ ranksum-test).

Social Life

In order to know how active participants' social life is, we ask them the frequency of going out in the evening and going out with friends in their free time (*d_social*). In France, 75.8% of students (91 students) declared going out/meeting friends at least 2/3 times a week, whereas in Vietnam the percentage was 68.3% (82 students). In France, there is a significant and positive relation between our social life variable and being creative (spearman rho coeff.=0.1670, $p=0.0683$; t-coeff.=-1.5031, $p=0.1355$, two-tailed test; $z=-1.822$, $p=0.0685$ ranksum-test). Conversely, no significant relation is found for Vietnam (spearman rho coeff.=0.0510, $p=0.5799$; t-coeff.=-0.8366, $p=0.4045$, two-tailed test; $z=-0.557$, $p=0.5778$ ranksum-test).

Demographic variables

Gender

Among participants in France, 49.2% were female whereas in Vietnam, 70% of participants (83 students) were female (gender). In France, there is no significant relation between gender and being creative (spearman rho coeff.=0.0991, $p=0.2815$; t-coeff.=-1.0350, $p=0.3028$, two-tailed test; $z=-1.081$, $p=0.2796$ ranksum-test). Similarly, no significant relation is found for Vietnam (spearman rho coeff.=0.0569, $p=0.5372$; t-coeff.=-1.2106, $p=0.2285$, two-tailed test; $z=-0.62$, $p=0.5350$ ranksum-test).

Origin

Among participants in France, 33.3% (40 students) were originally from Strasbourg whereas in Vietnam, 54.17% of participants (65 students) were originally from Ho Chi Minh (origin). In France, there is no significant relation between origin and being creative (spearman rho coeff.=-0.1302, $p=0.1565$; t-coeff.=1.3747, $p=0.1718$, two-tailed test; $z=1.420$, $p=0.1556$ ranksum-test). Similarly, no significant relation is found for Vietnam (spearman rho coeff.=0.0701, $p=0.4466$; t-coeff.=-0.3809, $p=0.7039$, two-tailed test; $z=-0.765$, $p=0.443$ ranksum-test).

Estimation results

This section examines the influence of social context, attitudes towards risk and ambiguity on creative performance for France and Vietnam. We present the estimations result on creative performance in Table 5 for France (column 1) and Vietnam (column 2).

Examining risk attitudes for each country, we find that, for France, participants investing percentages below 50% in the risk lottery increase their creativity score significantly ($p=0.003$). Specifically, among the 120 Strasbourg participants, 55 invested less than 50% of their creativity payoff. Among them, 46 scored at least 5 (84%), in contrast to the 65 participants who invested 50% or more, from which 68% scored at least 5. This contradicts the economic literature studying the relation between risk taking and creativity (see Carver White, 1994; Keltner et al., 2003, Lee et al., 2004; Mainemelis, 2010, Tesluk et al., 1997, among others). Conversely, there is no significant effect for Vietnamese participants ($p=0.171$), although the sign is positive. Our results in Vietnam are in line with Charness and Grieco (2019), not finding any significant relation between risk and creativity.

Next, we observe the interaction between self-perceived creativity and ambiguity aver-

Variables	Creativity	
	(France)	(Vietnam)
low_risk	0.843*** (0.280)	0.411 (0.298)
0.sp_creativity#1. amb_aversion	-0.027 (0.299)	-0.209 (0.421)
1.sp_creativity#0. amb_aversion	-0.071 (0.393)	0.797** (0.393)
1.sp_creativity#1. amb_aversion	0.087 (0.364)	0.545 (0.369)
t_intrinsic	0.104 (0.295)	0.725** (0.333)
gender	0.161 (0.249)	0.509 (0.320)
origin	-0.530* (0.281)	0.076 (0.264)
member_cultural_association	0.055 (0.465)	1.031*** (0.360)
homosexual_friends	0.433* (0.243)	0.340 (0.354)
sp_generalised_trust	0.456 (0.299)	0.241 (0.271)
sp_tolerance	-0.820*** (0.288)	-0.245 (0.318)
dsocial	0.663** (0.316)	0.494 (0.345)
dleisure	-0.351 (0.302)	0.073 (0.278)
Constant	5.033*** (0.597)	3.562*** (0.807)
Observations	120	120
R-squared	0.218	0.208
Controls	Yes	Yes
Country	France	Vietnam

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Estimation results

sion. In France, there is no significant effect of the interaction between ambiguous attitudes with self-perceived creativity. In fact, we find contradictory signs: when participants invest less in the ambiguous lottery than in the risk lottery (i.e. ambiguity averse), we find a negative interaction with their own perception as non-creative. Conversely, when they consider themselves as creative, the interaction with ambiguity aversion is positive, implying that those considering themselves as creative and investing less in the ambiguous lottery obtain higher scores. In addition, there is a positive and significant influence ($p=0.045$) on creativity for Vietnam. We find that those perceiving themselves as creative and are ambiguity lovers (i.e. those who invested the same percentage or more in the ambiguity lottery with respect to the risk lottery) performed better in the creativity task. This result contradicts Charness and Grieco (2019), which found a negative and no significant effect of ambiguity on creativity, and are partial in line with hypothesis 3, thus indicating that self-perceived creativity may play a role in clarifying the risk/ambiguity-creativity relationship.

In particular, in line with hypothesis 1, average scores for Vietnamese who considered themselves as creative are higher than those who do not have that same perception (6.18 vs 5.46, respectively with $z=-2.611$, $p=0.009$, ranksum test). There is also a significant evidence that those self-perceived creative participants who invested more in the ambiguous lottery scored higher ($z = -1.956$, $p = 0.050$, ranksum-test). Figures 1 and 2 depict the creativity scores depending on the percentage of investment on the ambiguous lottery for self-perceived creative participants (1) and for non-self-perceived creative participants (2). Comparing both figures, we find that average scores are higher for self-perceived creative participants (1) and that there are more ambiguity averse participants in 1 (35 vs 28 ambiguity lovers) than in 2 (23 vs 34 ambiguity lovers).

Participating in the intrinsic treatment, in which students could cooperate with other members of their team although their payoff were not influenced by that, is only significant for Vietnam ($p=0.032$) and not for France ($p=0.725$). Figure 3 displays the differences in terms of creative performance for each of the treatments and each of the countries. It is noteworthy to mention that the average creativity score in Vietnam in the intrinsic treatment is significantly higher than the one in France (6.47 vs 5.78, respectively; $t\text{-coeff.}=1.7539$, $p=0.0847$, two-tailed test).

If we examine intrinsic motivation when participants perceive themselves as being creative, we find that this treatment in particular induces a higher degree of creativity only

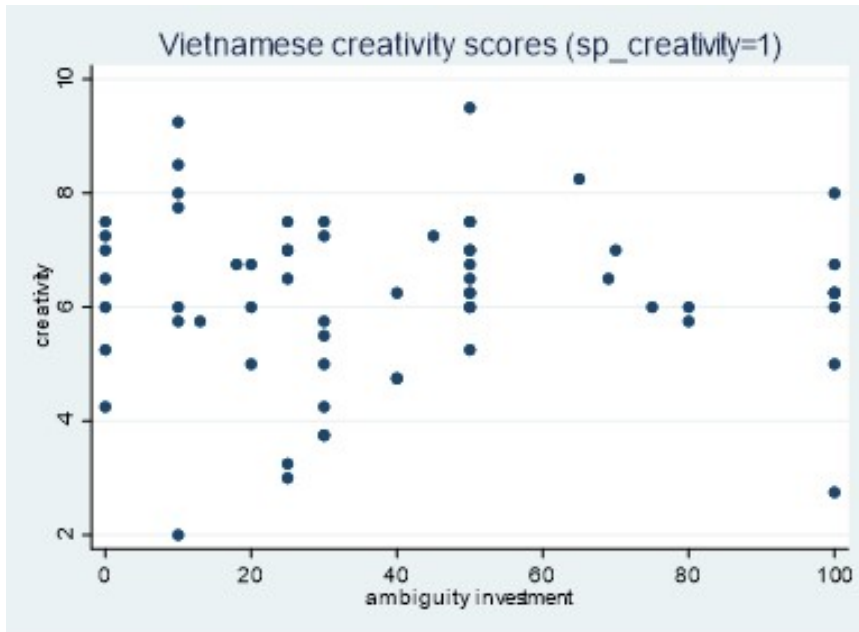


Figure 1: Vietnamese creativity scores when they perceive themselves as creative.

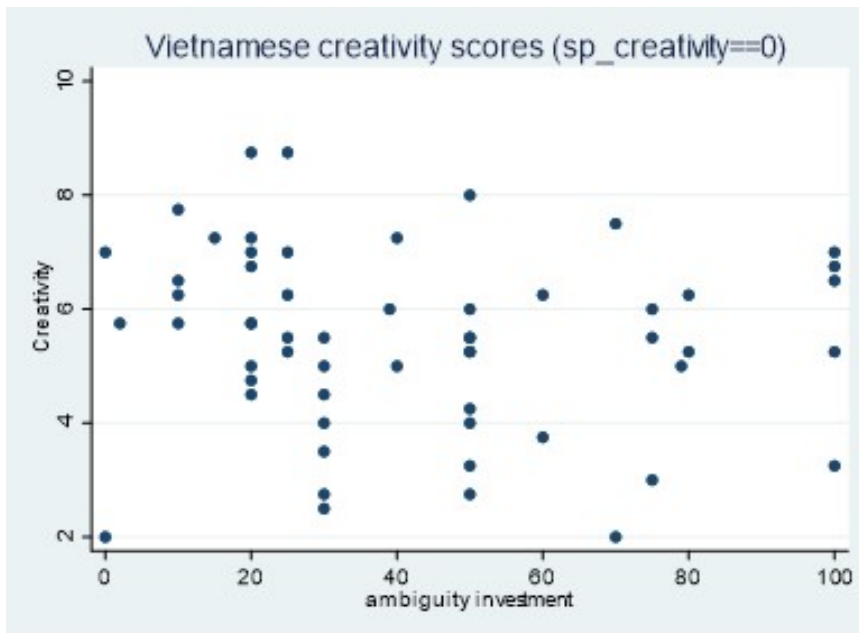


Figure 2: Vietnamese creativity scores when they perceive themselves as non creative.

for Vietnam. In this case, as depicted on Figure 4, participants get on average a score of 7.01, in contrast to 5.92 on average for the rest of the treatments ($z=-2.540$, $p=0.0111$,

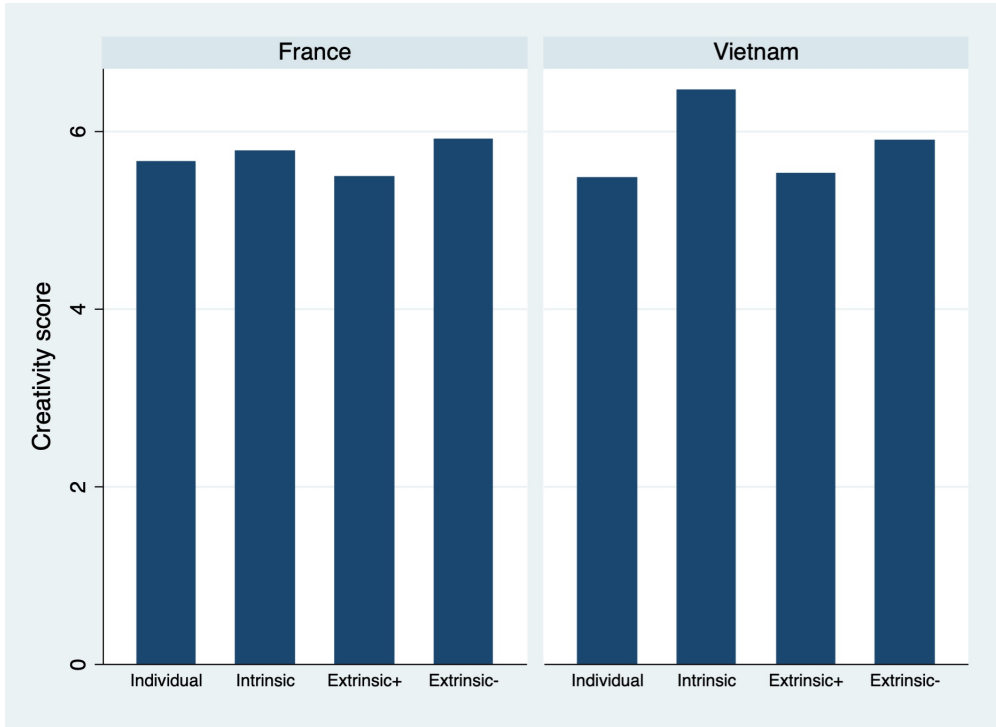


Figure 3: Creativity scores by countries and treatment.

ranksum-test; $t\text{-coeff.}=-2.6162$, $p=0.0112$). In France, creativity scores are on average 6.14 in the intrinsic treatment and 5.72 on average for the rest of the treatments. In this case, there is no significant differences among treatments for Strasbourg participants ($z=-0.407$, $p=0.6839$, ranksum-test; $t\text{-coeff.}=-0.8724$, $p=0.3880$, two-tailed test). We, therefore, find that Hypothesis 2 is satisfied only for Vietnam in which intrinsic motivation plays an important role in stimulating creative effort.

Analyzing demographic variables, no gender differences are found in Vietnam and France ($p=0.114$ and $p=0.519$, respectively). If we account for origin, in France, for those who are originally from Strasbourg, there is a negative and significant relation with performing high scores ($p=0.062$). That is, students who are not originally from Strasbourg (i.e. international students) performed better at the creativity task. In the case of Vietnam, there is no significant relation ($p=0.773$) and the sign is positive.

In terms of openness, we consider whether participants have friends with homosexual

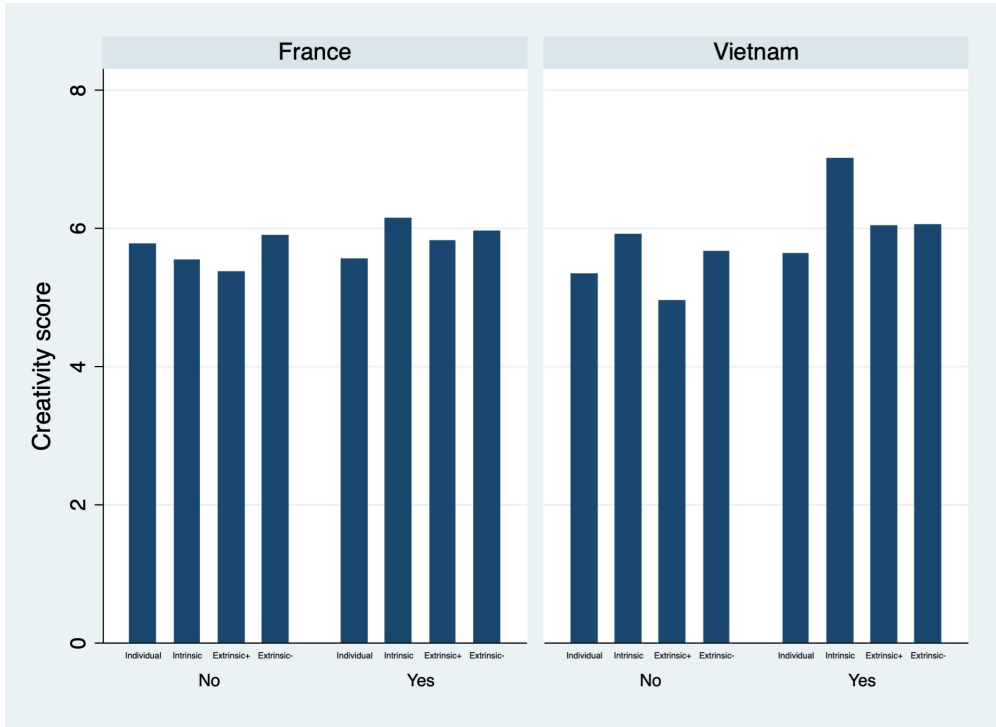


Figure 4: Creativity scores by countries, treatment and creativity perception.

orientation. We find that it is positive and significant ($p=0.062$) for France whereas there is no significant relation for Vietnam ($p=0.338$). Another indicator of openness is the perception of living in a tolerant city. For France, we find a negative and significant relation ($p=0.005$). Given that we ask participants if they think they live in a tolerant city or not, and looking at this negative sign we interpret this as those who score high (are creative) think that the city is not tolerant enough. For Vietnam, we do not find a significant relation although the sign is also negative. The fact of feeling that most of the people can be trusted is not significant in any of the two countries, although the sign is positive (i.e. open-minded and trustee people may be more creative than those who do not trust in general).

In order to account for active participation in cultural activities, we consider the fact of being a member of a cultural association. For France, we do not find a significant relation between creativity and this measure of active participation whereas for Vietnam, there is a significant and positive impact ($p=0.005$) over creative performance. Although only 15 Vietnamese participants answered affirmatively to this question, (are you a member of a cultural association?), 13 scored at least six. Considering social activities, we find that

there is a positive and significant relation ($p=0.039$) between going out in the evening or going out with friends, and higher scores in creativity for France. In the case of Vietnam, the sign is positive but the effect is not significant ($p=0.154$). Considering attending leisure activities such as going to the cinema, going to the theater or attending concerts, we find no significant effect in France ($p=0.247$) and Vietnam ($p=0.794$).

5 Conclusion

This paper aims to disentangle the relationship between creativity and three dimensions (motivation, risk and ambiguous attitudes, and social context) in two different countries. In our approach, the two geographical locations might be responsible for affecting differently the relationship between creativity and the three dimensions due to a West-East effect. In fact, the literature suggests that individuals in non-Western countries may respond differently from those from Western nations (see Anderson et al., 2004; England and Harpaz, 1990). Moreover, we explore the role that self-perception of creative abilities may play in influencing creative performances.

On the basis of previous findings, where creativity has positively been related toward the willingness to take risks, self-perceived creativity and self-efficacy, and both of them to intrinsic motivation and context, we develop the following specific hypothesis:

- H1 A positive relationship should link self-perception/efficacy on creativity and creativity itself.
- H2 The aforementioned relationship should be stronger in a context where intrinsic motivation is elicited.
- H3 A positive relationship between risk loving and creativity should be observed for people characterized by self-awareness.

The results of the estimation model are partially in line with our hypotheses and confirm that differences between countries are well pronounced. In fact, we do not find any variable that is significant for both countries. In contrast with H3, in terms of risk and ambiguity, risk aversion plays an important role in increasing creativity scores for Strasbourg students, whereas for Vietnam we find that those ambiguity lovers and being aware of their performance are more creative. Given that Vietnam is a recent developed country, and participants at the experiment are aware of the opportunity that they have as university

students in their country, their attitudes toward risk and ambiguity might be quite different because of their ambitious approach.

We also observe a positive and significant relation between intrinsic motivation and creativity, but only for Vietnam. In fact, the effect is more pronounced when we also account for self-perceived creativity. This, in part, can be explained by the development of the experiment. Participants start performing their creativity task. Then, they take risk and ambiguity decisions, whose payoffs depend on their previous performance. If they are sure that they performed really well, they can bet according to their expected payoff. Finally, they are asked whether they defined themselves as creative or not. If they think they did not perform well in the creativity task, they will answer that they are not creative. For Vietnam, there is a positive and significant correlation between self-perceived creativity and creative performance (spearman rho=0.2393, p=0.0085). Therefore, H1 is validated by our results.

Introducing intrinsic motivation, the correlation is higher (spearman rho=0.3594, p=0.0511), meaning that under this particular treatment, Vietnamese students are motivated not only by the organizational setup but also by stimuli such as self-realization, sense of duty or curiosity (Golann, 1963; Amabile, 1983; 1985; Staw, 1989). This validates H2, although there is a geographical/cultural context since it only occurs in Vietnam.

We, therefore, find that H2 is satisfied only for Vietnam in which intrinsic motivation plays an important role in stimulating creative effort. This result contributes to the self-efficacy literature that relates individuals' confidence with good performance and to the intrinsic motivation literature (see Amabile, 1983, 1996; Harter, 1978; Utman, 1997).

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