

Can mass media and the educational institutions change the entrepreneurial culture? A study of how a single story can change the risk-taking behaviour of individuals

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Abstract: Willingness to take risk is an important characteristic of entrepreneurship and a crucial factor for economic growth. Data show that compared to their US counterparts, people in Europe, and even more so in Eastern Europe, are less willing to undertake the risk of building their own business. The experimental data presented in this paper demonstrate that people can use even a single episode from their own past experience (or from a newspaper story) where they or someone else acted in a risky manner and benefited from that, and choose to act riskily in a new situation by analogy. Thus, the possibility of developing an active policy for developing risk-taking preference and entrepreneurial culture by providing many positive examples of such behaviour via the mass media, the film industry, and educational system is open and could turn out to be effective even in the short run.

Keywords: risk; individual decision making; preference change; analogy making; psychological experiments.

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Biographical notes: Boicho Kokinov is a cognitive scientist primarily interested in human thinking and memory. He has proposed the general cognitive architecture DUAL, and has built, together with his collaborators, a number of models on its basis: AMBR, JUDGEMAP and PEAN. He has been studying the interaction between conscious and unconscious processes in problem solving and decision making, and demonstrated various contextual effects. Kokinov studied Mathematics and Computer Science at the Sofia University, but became interested in psychology and ended up researching about the human mind. He is one of the founding members of the New Bulgarian University, Co-director of its Central and East European Center of Cognitive Science, and has been a Director of the *Annual International Summer School on Cognitive Science* since 1994. He is Co-editor of *The Analogical Mind*; *Constructive Memory*; *Advances in Cognitive Economics*; *Modelling and Using Context*, and sits on the advisory board of *Cognitive Science Quarterly*.

1 Introduction: motivation – how to change the entrepreneurial culture

The “Entrepreneurs are the economic DNA”, says the European Enterprise and Industry Commissioner Gunter Verheugen. The European Commission has put forward an entrepreneurship action plan in order to encourage people to take the risk of starting up new companies or growing the existing ones. One of the strongest obstacles towards this goal, however, turns out to be people’s attitude towards risk. The data from a recent study by EOS Gallup Europe (2004), the ‘Flash Eurobarometer 160’, show that in contrast to the low level of risk avoidance in the USA, where only 33% of the respondents agreed with the statement “One should not start a business if there is a risk that it might fail”, the situation in Europe is rather worse – 50% of the respondents in the old member states (EU15) agreed with this statement, and almost double as much as in the USA – 62% of the respondents in the new member states (EU10) agreed with it. This means that changing peoples’ attitude towards risk taking is probably more important for encouraging entrepreneurship than providing financial resources or simplifying the administrative procedures for the registration of new business.

As it is evident from the above data, the worst situation is in the countries in transition from communist regime towards market economy. I am most familiar with the data about Bulgarians’ mental attitudes, but I assume they do not differ significantly from the other countries in the region of East Europe. All empirical sociological studies in Bulgaria after 1989 convincingly demonstrate that people still expect that the state should be responsible for their lives, workplaces, salaries, education, medical treatments, *etc.* Thus, “about 80% of Bulgarian respondents demand that the government guarantees every individual employment and a minimum standard of living” (Gornev and Boyadjieva, 1996). As a response to the direct question “whose responsibility is to ensure a job for you?” in two studies organised by Zaharieva in 2001 and Mantarova in 2006 (personal communication), the following data were obtained: it is my responsibility – 18.6% (in 1998) and 20.1% (in 2004); it is the responsibility of the state – 44.6% (in 1998) and 54.5% (in 2004). A study by the Bulgarian Market Link agency in 2006 shows that 78% of the Bulgarian population subscribes to the statement “I prefer not to risk if I am not sure in the success”, which is even higher than the average data for the NMS above.

The differences between the eastern and the western parts of Europe might be due to different individual preferences formed adaptively within long-lasting cultural traditions starting with ancient times. If this was the case, it would be a real challenge to try to change these attitudes. However, a recent study by Alesina and Fuchs-Schuendeln (2005) has demonstrated that this is not the case. They have compared the attitudes of West and East Germans who have the very same long-lasting cultural traditions but have lived in different cultural, economic, and political conditions in the last 45 years. The results clearly demonstrate that the differences in individual preferences between the East and the West are due to the communist practices that East German people have experienced. It turns out that East Germans are significantly more likely to have a preference for state responsibility over individual’s responsibility for financial security when unemployed, sick, old, or requiring care, as well as for the financial security of the family (14.5–17 percentage points difference). Alesina and Fuchs-Schuendeln compared the data from 1997 and 2002 and found a very slow process of convergence (East Germans are gradually diminishing their state intervention preference). They estimate

that East and West Germans will eventually converge in their state-redistribution preferences in one or two generations. The question is whether we should wait for 40 years to erase the effect of communism or we can somehow speed up the process with an active policy.

In summary, the motivation of the current work lies in the understanding that the major obstacle in, or facilitator of, economic development is cognitive in nature; it depends on what peoples' preferences and attitudes are, what their mental models are, how they think and behave. The author of this paper agrees with those who acknowledge the need for developing an entrepreneurial culture in Europe, and especially in Eastern Europe as a means for achieving higher competitiveness and economic growth and therefore higher welfare of people in the region. Then the issue is how such a culture can be gradually developed, and in that sense, whether individual preferences can be changed and how. More specifically, this paper will look into the preferences for risky or safe decisions, since as the data by EOS Gallup Europe (2004) show, being afraid of risk is a major obstacle for building an entrepreneurial culture in a continent, a country, or a company. It is unclear whether an effective policy exists that could eventually result in preference change and this is the topic of the current paper. However, even if that is possible, one might object that establishing such a policy for active attitude change is a form of paternalism and no one knows what the 'right attitudes' are. That is very true in general, however, in the case of Eastern Europe, we have a specific case where the propaganda and the communist regime have actively changed and distorted peoples' traditional attitudes as the study of Alesina and Fuchs-Schuendeln (2005) demonstrate, and an active policy in the opposite direction would probably only restore the 'natural' or traditional culture in the country. Thus, for example, many Bulgarian historians believe that the Bulgarian pre-Second World War society was much more entrepreneurial and economically active, and that Bulgarian economy was much more competitive before the communist period started (Avramov, 2001).

This paper explores the issue of whether an active policy of attitude change can be effective at all in an empirical way, informed by cognitive science theories of decision making and analogy making. Section 2 introduces the theoretical background of a cognitive mechanism (analogy making) that may possibly play an important role in this preference change. Then, Section 3 describes the empirical study performed. And finally, some conclusions are provided.

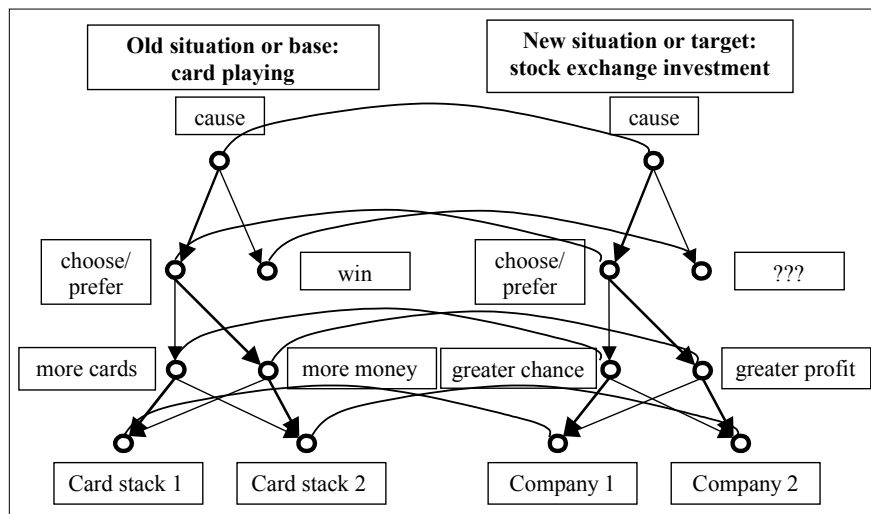
2 The possible role of analogy making in decision making and preference change

Some cognitive scientists believe that analogy making is a basic mechanism that plays a central role in human thinking, categorisation, perception, learning and language (Hofstadter, 1985; Hofstadter, 2001; Holyoak *et al.*, 2001). There is evidence that small children and infants make analogies (Goswami, 2001), and that even some language-trained chimpanzees are able to make analogies (Gillan *et al.*, 1981; Oden *et al.*, 2001). It is an open issue whether analogy making plays the same role in decision making. Analogy making is a mechanism for learning based on a single case (a single episode of past experience), and that is why this mechanism ensures fast learning. The question is whether analogy can help us in changing preferences for risky or safe decision. This is a still unexplored issue.

There are mostly theoretical speculations that people make decisions based on analogical cases. Gilboa and Schmeidler (1995; 2001) have argued for case-based decision making and Kokinov (2003) has speculated about the possibility to explain human cooperative behaviour in game-theoretic context by means of analogy making with the previous games/moves. There is some empirical evidence for the real use of past episodes in social judgement and decisions (Gilovich, 1981), and for the use of analogical mapping in comparing the alternatives in choice (Markman and Moreau, 2001). However, the issue of spontaneous analogy use in decision making is largely unexplored empirically and this is one of the purposes of the current paper. Neither has studied the even more specific question of whether one can change the preference for risk aversion by means of a spontaneous analogy.

The analogy-making process involves several subprocesses: *representation building* of the target situation, *retrieval* of an appropriate base from long-term memory, *mapping* the base onto the target situation, *transfer* of some piece of knowledge or solution/decision strategy from the base to the target, *evaluation* of the transferred knowledge, and possibly *generalisation* (Kokinov, 1988; Kokinov, 1994; Kokinov and Petrov, 2001). Following this decomposition, there are a number of crucial points in order for an analogy to be used successfully. The target situation must be perceived in appropriate terms (that will make it connect to other episodes in long-term memory), otherwise, no analogy will be found. The analogous base has to be spontaneously retrieved from memory, which is a process without conscious control on it. The mapping between the two cases should be successful, which means that the two cases should have common structure of relations; there is much empirical support for the claim that the relations, but not the objects and their properties, are important in analogy making, *i.e.*, people evaluate a comparison as a good analogy when the two cases share the same structure of relations even when the objects and their properties are very different (Gentner, 1983; Gentner, 1989; Gentner *et al.*, 1993). The mapping process involves finding the correspondences between the elements and relations in the two cases (Figure 1). Finally, the decision strategy or the solution has to be transferred and evaluated. There are a number of problems associated with each of these subprocesses.

Figure 1 Analogical mapping between a card-playing situation and an investment decision at the stock exchange



Transfer of the successful decision strategy: choosing the more risky and potentially more profitable option. This is an example of relatively remote analogy, since to find the analogy, a very abstract mapping between ‘cards stack’ and ‘company’, ‘more cards’ and ‘greater chance’, ‘more money’ and ‘greater profit’ is required. A closer, older situation would be a currency speculation choice, and an even closer one – another investment situation.

The use of analogy in the above example seems quite problematic, since it is well known that people rarely make remote analogies (Gick and Holyoak, 1980) and that superficial similarity plays a crucial role in spontaneous analogies (Gentner and Landers, 1985; Gentner *et al.*, 1993; Holyoak and Koh, 1987). This means that people are reminded mostly about an analogous case in the same domain, which, if true also for decision making, would make the preference change difficult and highly limited. However, there is also some evidence that people make remote analogies in their everyday life (Dunbar, 2001). Thus, our specific research question related to decision making and risk aversion needs to be empirically explored.

Finally, even if people use previous experiences as possible bases for analogy, if all (or most) of their experience is risk avoiding (which, for example, has been formed during the communist regime where risk and initiative are not tolerated), then one wonders where these positive cases of risk taking would come from. The question is whether they can come from other people’s experience.

As we see, the possible role of analogy in preference reversal is unclear: there is general supporting evidence that analogy is a powerful learning mechanism, but there is no evidence that it can help in the particular case of changing risk avoidance, and the latter seems questionable from many directions. That is why we undertake an empirical study trying to answer the questions posed above.

3 The empirical study

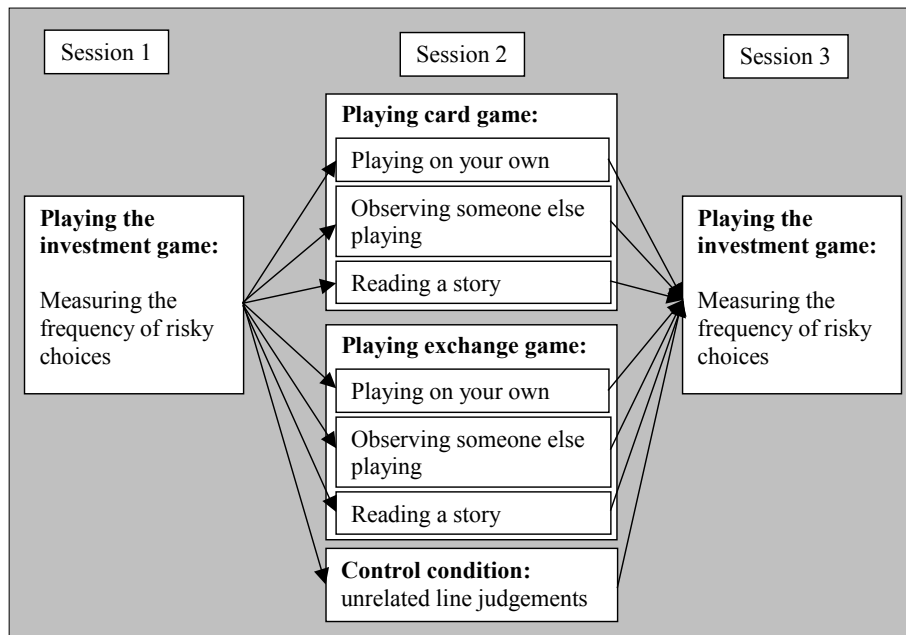
The controlled lab experiment that was performed aimed at answering three questions:

- 1 Will people spontaneously use analogical cases when making economic decisions and can this lead to preference change towards more risky options?
- 2 Can people use remote analogies in such situations or will the analogy usage be restricted to highly similar cases?
- 3 Will people use cases which they read about or only cases from their own experience?

The general idea of the experimental study is to measure participants’ preference for the risky options in an investment game, then to manipulate them either by furnishing them with a case of risky but profitable own experience, or by letting them know about someone else’s positive experience with risk taking, and then finally, to measure their preference for the same risky options in the same investment game again (Figure 2). If the percentage of their risky choices increases, this would mean that our manipulation was successful and the participants have spontaneously used the provided single analogical case and changed their decision behaviour. This experiment has a mixed design: a within-subject ‘experience’ factor – Session 3, versus Session 1 – repeated measurements; and two between-group factors. The first factor is *distance* between the

provided experience and the tested target case: we have two levels – a close analogy (exchange game) and a remote analogy (card game). The second factor is the way of acquiring of the previous experience (the base for analogy): personally experiencing a positive risk-taking case, observing someone else’s positive risky experience, or reading a story from the newspaper about someone’s benefits from a risky choice.

Figure 2 General design/procedure of the experiment



The participants in the study entered the experimental lab and were invited by an experimenter (A) to participate in an investment game. The instruction involved the explicit promise to be paid for their participation proportionally to the money they will gain in this game. After finishing the game, they were invited to come back to participate in another session, and thus in Session 3, the same experimenter asked them to play the same investment game. Meanwhile, another experimenter (B) asked them to participate in another experiment (which was actually our manipulation – Session 2, which was supposed to provide the analogy for the third session). Participants were divided into seven groups depending on what experimental condition they were assigned to in Session 2 (see Figure 2): we had six experimental conditions depending on the type of game and the type of participation they had in Session 2, and a control condition in which they had to participate in a completely unrelated experimental study (judgement of line segments length).

In the case of acquiring their own risk-taking experience, they played a game (a card game or an exchange game), which was manipulated in such a way that the actual winning chance was greater than the one that the participants saw or could calculate. In this way, after a while, the participants started to play more riskily and thus win more money. That is how they acquired a single case of their own experience where picking up the risky option was beneficial for them.

In the case of learning from someone else's experience, the participants were asked to observe another participant play another game (a card game or an exchange game) and to try to predict his or her next choice. Actually, this other participant was our confederate and made more often risky choices than safe choices and in most cases, he/she was winning. In such a way, we hoped that the participant will encode an episode in his/her long-term memory about someone's success when playing more riskily. In this case, they were personally witnessing their success. So, we hoped that this case might be used later on as a base for analogy in their own decision-making situation.

Finally, in the third condition, the participants were asked to read a story from a newspaper (actually we have written the story ourselves but pretended to have taken it from a newspaper) and try to remember it. Then a memory test was administered to see whether they have remembered the story – and it turned out to be easy – all our participants successfully passed the memory test. In this way, we were assured that a new episode was formed in their long-term memory – an episode representing the newspaper story – and hoped again that this episode might serve as a basis for analogy in their future decision-making situations.

The investment game that the participants were playing in Sessions 1 and 3 had ten trials without immediate feedback. There was an example trial: "Here you have \$1,000 that you have to invest on the stock market. You have the choice to buy shares either of Company A (with 20% chances to win \$80,000) or of Company B (with 80% chances to win \$20,000)." Since the expected values of both options are the same, only the differences in risk attitudes determine the choice between the two. Thus, the dependent variable was the number of 'risky' choices participants made among these ten trials.

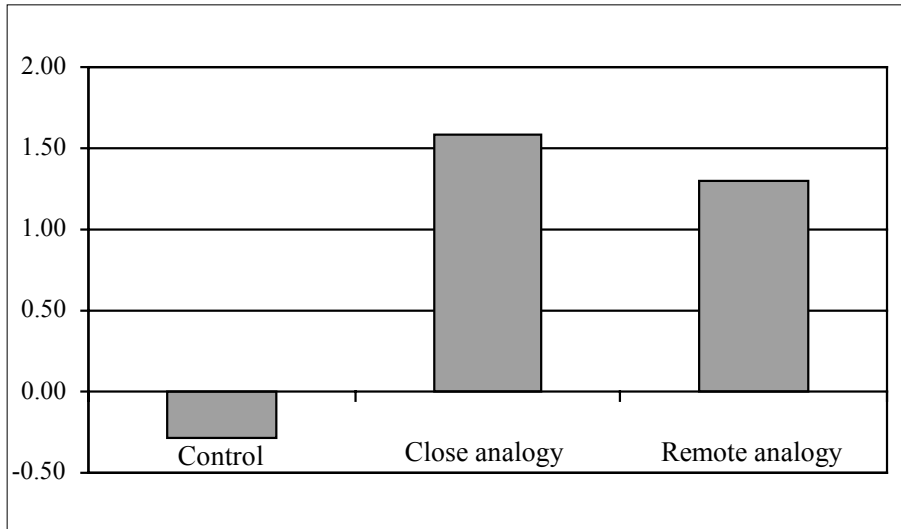
The exchange game that the participants in the close-analogy condition played in Session 2 was very similar to the investment game form: "Here you have \$1,000 that you have to exchange for another currency. You have the choice to buy either Currency A (with 20% chances to get \$8,000 when exchanged back within a year) or Currency B (with 80% chances to get \$2,000 when exchanged back within a year)." Again, the mathematical expectation was the same for both choices.

Finally, the card game that the participants in the remote-analogy condition played in Session 2 was the following: "There are 10 cards on the table and one of them is an Ace. The cards are placed with their backs upwards in two columns: one of three cards, the other of seven cards. You have to guess in which column the Ace is. If you guess the column containing the Ace correctly, you will get 70 points (in the case of the first column), or 30 points (in the case of the second column)." The participants actually saw the cards on the computer screen. Again, the mathematical expectation was the same for the two choices, and the internal attitude towards risk taking was revealed in the game. The analogy between the card game and the investment game is more distant, but from Figure 1, one can easily see why the two cases are analogous.

A total of 149 students participated in the experiment and the results were analysed by univariate ANOVA. The dependent variable was the difference between the number of risky choices made in Session 3 and Session 1. There was a main effect of the analogy ($F(1,147) = 53.570$, $p = 0.001$) leading to an increase of the mean number of risky choices from 3.34 (among ten trials) in Session 1 to 4.77 in Session 3 in the experimental conditions, while there was a slight decrease of the number of risky choices in the control condition. In both the close- and the remote-analogical condition, the participants choose

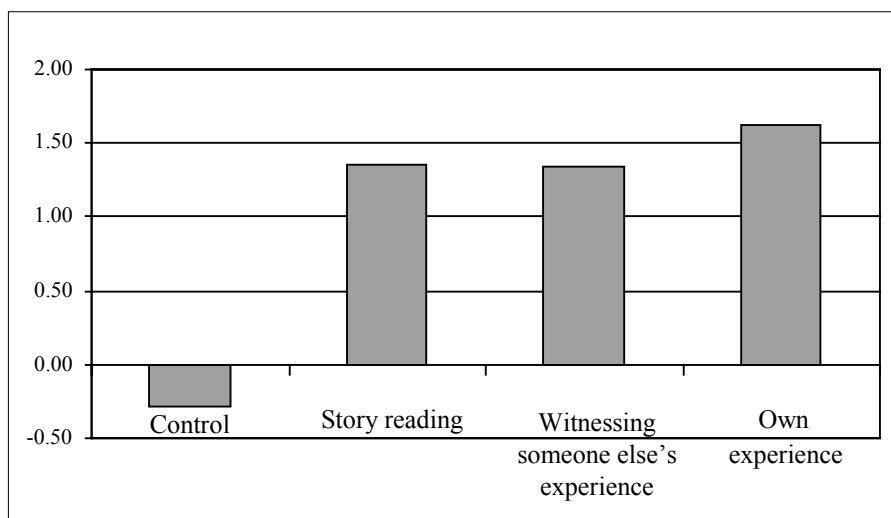
the risky option significantly more often than in the control group where no analogy was provided (Figure 3). This is actually a very optimistic result – it shows that people are spontaneously using both close- and remote-analogies in their decision-making process.

Figure 3 Increase of the number of risky choices depending on the manipulation (control group versus close or remote analogy provided)



The next result shows that all three ways of acquisition of the positive risk-taking experience are effective. The participants made a spontaneous analogy and transferred the risky strategy in all three cases: own experience, witnessing someone else's experience and reading a story in the newspaper (Figure 4).

Figure 4 Increase of the number of risky choices depending on the way of acquisition of the positive experience (the way the analogy was provided)



4 Conclusion

The results obtained in this experiment provide evidence that analogy making does play a role in decision making and that even a single positive case can change peoples' preferences and make them more willing to take risks. They also show that both close- and remote-analogies can play such a role and therefore people can transfer from one domain to another. Finally, the results demonstrated that people learn not only from their own experience, but also from other peoples' experience, even from stories read in a newspaper. These results are actually very optimistic: they suggest that peoples' attitude towards risk taking can be possibly changed by the mass media, the educational system and the film industry, if they provide encouraging examples of entrepreneurship. The 'analogy effect' can be combined with the 'contextual effect' (Kokinov and Raeva, 2006) that encourages risk-taking by providing positive cues in the environment. This could result in a faster change towards entrepreneurial culture, and we would not have to wait for several generations for the transition period from communism towards market economy to happen in East Europe. Similarly, Europeans as a whole might become more entrepreneurial and become more competitive on the global market. Finally, in the same way, each company may have an active policy in changing the organisational culture by providing and disseminating the good practices. People learn fast – even from a single example!

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