

CAN A SINGLE EPISODE OR A SINGLE STORY CHANGE OUR WILLINGNESS TO RISK? THE ROLE OF ANALOGIES IN DECISION-MAKING

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ABSTRACT

Willingness to risk is an important characteristic of entrepreneurship and a crucial factor for economic growth and economic development. An experimental study has been performed that demonstrates that people can use even a single old episodes from their own experience where they acted in a risky manner and benefited from that and chose by analogy to act risky in a new situation. Moreover, it has been demonstrated that the same effect may happen if people have just read a story about someone else benefiting from risky behavior.

MOTIVATION

The Cognitive Nature of Economic Changes in Societies in Transition

The main problem of societies that are making a transition from communism towards capitalism is a badly needed but difficult to achieve change in citizens' mentality: people in these countries have been trained for years not to take any initiative, not to risk, not to take the responsibility for their own life, but to expect someone else to solve their problems – the government, the state, the “boss”, etc. They enjoyed secure and predictable life at the expense of living at low-level economic standards. There were no workless people, companies did not bankrupt, and thus people could feel secure for the rest of their life without making any efforts, without having to make difficult decisions, without undertaking any

risk. They knew that their incomes will not change substantially even if they would work harder, even if they would change their job, and even if they would undertake some risky initiative. On the contrary, they might have been even punished for this risky initiative. However, taking the initiative and making risky decisions are the most important patterns of behavior in market economy. They are important characteristics of entrepreneurship and a key factor for economic growth.

Thus the most important factor for economic changes in these countries appears to be cognitive in nature and the main question is how this well-trained but not any more appropriate pattern of behavior could be changed (if at all possible within the lifetime of the current generation). In other words how the society can learn, how its citizens can learn to be more willing to risk and to take their own initiatives.

Analogy-Making as a Basic Cognitive Mechanism

The research described in this paper is based on the belief that analogy-making is at the heart of human cognition and much of human behavior and human thinking is based on analogies with episodes from our past (Hofstadter, 1985, 2001, Holyoak, Gentner, Kokinov, 2001). There is growing evidence that adults are learning by analogy (Gentner, 1989, Holyoak, & Thagard, 1997), that small children and infants are learning by analogy (Goswami, 2001), and that even chimpanzees are able to make analogies when appropriately trained (Gillan, Premack, Woodruff, 1981,

Oden, Thompson, Premack, 2001). Thus analogy-making seems a good candidate for a cognitive mechanism for achieving the required change in people's behavior. There are, however, at least two unsolved puzzles that need to be investigated.

Do People Really Use Analogies in Decision-Making?

Even though there is much evidence for the role of analogy in learning, in reasoning, in problem solving, in argumentation, etc., still there is no much direct evidence that analogy plays such a central role in decision-making as well. There has been some theoretical speculations on the role of analogy in human decisions (Gilboa, I. & Schmeidler, D., 1995, 2001, Kokinov, 2003) and also some evidence has been provided for real use of past episodes in social judgment and decisions (Gilovich, 1981) and for the use of analogical mapping in comparing the alternatives in choice (Markman, A.B. & Moreau, 2001), however, much more efforts are needed for direct study of human decision-making and how it relates to analogy-making. Thus, this paper describes an experiment that studies how past episodes contribute to the decision-making process of players who buy shares on the stock market in a kind of gambling game.

Even if we find out that people use analogies in decision-making it will still be unclear whether they can make remote analogies. There is much evidence in the literature on problem solving that it is difficult to make remote analogies (Gick & Holyoak, 1980), that superficial similarity between the old episode and the new one may be crucial for spontaneously recalling the old episode and thus using it as a base for analogy (Gentner, & Landers, 1985, Gentner, Rattermann, & Forbus, 1993, Holyoak & Koh, 1987). However, if analogy is limited only to superficially similar experience it would not have a far reaching consequences for learning to behave in new situations which might be radically different (superficially) from the previous experience.

In the problem-solving and argumentation literature there is some evidence that people are actually making remote analogies in their natural environments (Dunbar, 2001). So, we would have to test whether this would also be true for decision-making situations.

Where Appropriate Episodes Could Come from? The Role of Education and Media.

The problem with such abrupt changes in the society like the transition to a new economic and political system is that people do not have episodes in their past that can help them to find solutions which would be appropriate in the new circumstances. All their experience is based on episodes from the communist past and actually tells them not to risk (if they make the analogy).

Thus the question arises how can people be suddenly equipped with episodes that could tell them to risk and to take the initiative. There seems to be a vicious circle here – they do not have positive examples of risk-taking behavior in their memory and thus do not act risky in the new circumstances and thus only introduce new risk-avoiding episodes in their memory which later on serve as bases for analogy in new decision-making situations and in this way the risk-avoiding behavior is being constantly reproduced.

Is there a way out of this circle? This is the central question posed by the current paper. A possible answer would be that the society leaders could develop a policy of providing positive examples of risk-taking initiatives that result in improving people's life. These examples could be provided by the educational system, by the media, by the film industry, etc. By the way, the American culture is a prototypical example of such a mass generation of positive examples of risky and entrepreneurial behavior. People tend to believe that this might be one of the reasons for the economic success of this nation. However, there is no evidence for any direct relation between this cultural peculiarity and the economic development. Moreover, there is no evidence that

people can use other people's experience or newspaper stories as a base for analogy-making. This is an issue that is being directly addressed in the current experimental study.

EXPERIMENT

Aims and hypotheses

The current experiment is an attempt to answer the following questions:

- Can a single episode change our willingness to risk? In other words, do people use analogies in their decision-making process?
- If they do, do they use only close superficially similar cases or they can make also remote analogies?
- If people use analogical cases in their decision-making process, should these be necessarily cases from their own experience, i.e. cases in which they personally risked and benefited, or these cases may also be episodes that they have witnessed or stories they have read about.

We had strong and clear hypothesis related to the first question. Thus we expected that people will make analogies and even a single episode might change their behavior. This hypothesis is based on the wide literature on the use of analogies in other domains, such as problem solving, reasoning, argumentation, etc. Decision-making could not have been an exception. Still there are no experimental facts to support this hypothesis.

There were controversial expectations related to the second question, since the results in the literature on problem solving are controversial – most people report that the participants in their experimental study performed in the lab do not make spontaneously remote analogies unless they are hinted to do so, still other studies show that people do make spontaneously remote analogies in real life.

We had controversial arguments related to the last question as well. On one hand, we hoped that even reading a story might change human behavior because this would mean that there is a way out of the vicious circle de-

scribed in the introductory section. Also in the problem solving literature very often people are presented with a story which is then being used spontaneously by analogy to solve a new problem. Still, since in our study we were going to investigate situations with high personal involvement (participants were motivated by actually being paid proportionally to their success in the investment game they were playing) it might have been the case that their strong negative personal experience with risk-taking behavior would override and completely overshadow the single story they read in the newspaper. In addition, people may not trust the source of the story – the particular newspapers or the media in general. Thus the outcome was not known in advance. For that reason, we introduced also a third possibility – participants to directly observe the benefits that someone else has from a risky behavior. This would eliminate at least the issue of participants' trust in the media.

Method

Design. The experiment has mixed three factorial design. The dependent variable is the frequency (or proportion) of risky choices participants make during the target investment game.

The within subject factor is the analogical manipulation – thus we measure twice the tendency for making risky decision – before and after the introduction of the analogical case.

The between group factors are: type of analogy – close and remote, and type of manipulation – inducing participants own positive experience with risky behavior, witnessing someone else's fruitful risky experience, or finally, reading a story in the newspaper about someone's profitable risky experience. Thus there were 6 experimental groups and one control group in the experiment.

Material. The target game on which the participants' willingness to risk is measured is a kind of investment game. They are offered a chance to invest Euro 1000 in shares either of

company A (which has high chances to be beneficial, but bringing in low benefits (say company A ensures profit of Euro 100 with 90% probability), or of company B (which has low chances to turn out to be beneficial but if so, it will bring the participant a big profit (say, company B ensures profit of Euro 900 with 10% probability). Ten such trials have been offered to each participant in the game. The figures have been always selected in such a way that the mathematical expectation of both alternatives to be equal. In this way participants could not calculate which investment is more beneficial in an objective way and they had to reveal their internal willingness to risk and this is what we were willing to change with the manipulation.

The games that were used as possible bases for analogy were either a financial speculation game (in the close analogy condition) or a card playing gamble game (in the remote analogy condition) – in this game they had to guess where a specific card is – they would get a reward each time they guess correctly. The reward was bigger if their guess was more risky (i.e. if they bet on the smaller pile of cards). This game has been used in a previous study of risk-taking behavior (Kokinov, Raeva, 2004).

Procedure. Participants in this study had to pass through several sessions. In the *first session* they simply played the target investment game 10 times without any feedback – thus this particular episode could not change their attitude towards risk and profit. In the *second session* they either participated in another completely unrelated study (for the control group) or played one of the analogous games described above (own experience condition), or observed other participants playing this analogous game (observer condition), or read a story from the newspaper describing someone playing one of these analogous games and having a risk-seeking behavior and winning a lot of money. In the third session, participants played again the target game just like in the first session (to observe whether

there will be changes in this participant's behavior).

Participants. 149 individuals took part in the experiment; they were mainly undergraduate students at NBU. They were paid depending on the results of the games they played. This was expected to motivate them to win more money and behave as in a real economic situation.

Results and Discussion

The repeated measurements ANOVA method was used to test the hypotheses outlined above. It turned out that there was a main effect of analogy ($F(1,122)=49.225, p<0.000$) leading to an increase of the mean number of risky choices from 3.34 (among 10 trials) in the first session to 4.77 in the last session. There was no main effect of the mode of manipulation (own experience vs. witnessing vs. reading a story), and no main effect of the type of analogy (close vs. remote). No interactions between the factors were observed. The increase in the number of risky choices in the various conditions is presented in Figure 1.

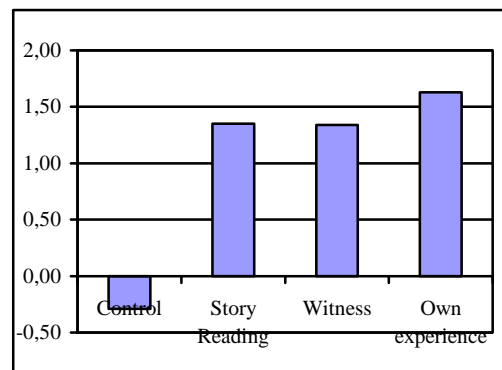


Figure 1. Increase of number of risky choices depending on the manipulation (control group vs. analogy provided).

CONCLUSIONS

The experiment has clearly demonstrated that people do use analogies in their decision-making process and they can benefit even from a single case if they find it analogous to the current choice situation.

The experiments also demonstrated that people do make also remote analogies. In fact, no significant difference was found between close and remote analogies. Of course, further experiments are needed to test even more remote analogies – in the present experiments still all situations were related to some kind of game playing (even though the games were very different).

Finally, it turned out that people not only can benefit from old analogous cases from their own experience, but they can benefit from cases they have directly witnessed or even from cases about which they have only read in a newspaper. This makes it possible this paper to finish with a happy end – it shows that there is a way out of the vicious circle, namely that if the educational system, the media, and the film industry do provide more positive examples of people who undertake an initiative, who take the risk to pursue a difficult goal and who succeed; this would result in a change of the behaviour of the society members making them more willing to risk. This, on its turn, would eventually ensure a real change towards market economy and economic growth (if nothing else goes wrong).

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