

## **Influence of Prospective and Situational Sets on the Correctness of Probabilistic Judgments**

*David Charkviani, Professor*

*David Dzidziguri, Professor*

Grigol Robakidze University, Tbilisi, Georgia

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### **Abstract**

Investigation of psychical mechanisms of probabilistic thinking revealed its limited rationality, reflecting specificity of subjective comprehension of one on other problem by people. The concepts satisfying the theory of probabilistic thinking are impersonal, and determined by psychic mechanisms are personal. In case of personal rationality cognitive activity of people serves to satisfaction of different needs people have. Besides, when making decision they reveal purposive playing an important role in assessment of alternatives out of multiple possible choices. Considering the main principles of the set theory, we assume that functioning of probabilistic judgments is determined by relevant set formed in the process of purposive activity of human. As to temporary parameter, two forms of the set can be defined: prospective (orientation on the result of future event) and situational (orientation of the result of current event). In the conducted experiment the influence of the above mentioned sets on probabilistic judgments and confidence in correctness of the choice taking into feedback factor (mark of the fulfilled task) was studied.

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**Keywords:** Prospective sets, situational sets, set theory, probabilistic judgment

### **Introduction**

For a long time being under the influence of philosophy of logical analysis the investigators of cognitive processes identified everyday thinking with logical reasoning. However, modern psychological research directed to the detection of the peculiarities of reasoning in different life situations, evidenced the irregularity of the above identity. The whole direction was formed. It was the so-called investigation of social cognition meaning the empiric study of the peculiarities of comprehension, consciousness and interpreting, concerning the own behavior of a human and actions of the other people (1). In our case, we are interested in the problem of social probabilistic judgment performed by a human under the conditions of

uncertainty. The main assumption we are keeping to consist in the fact that probabilistic judgment as evaluation of probable results is determined by the corresponding set, formed in the process of targeted activity of a human.

In general psychological theory of the set together with unconscious processes the property of reasonability is underlined, i.e. in determination of molar behavior, the decisive role is derived from consciousness. Considering the issue concerning the definition of functioning of the set, Dimitri Uznadze comes to the following conclusion: “thus, specific peculiarity of human vitally differentiating him from animal is that consciousness plays the leading role in his/her life. He/she is aware of his/her own behavior ahead and any action he/she does with the account of what he/she can get in a result of such consciousness” (2, 91). Knowledge acquisition by students in higher institutions is an evident example of the task-oriented behavior. This process means a student’s oriented comprehension of the specificity of a future profession, acquisition of professional skills, which should be achieved on the basis of application of multisided educational methods. Learning the educational courses by the students is performed on the basis of task-oriented behavior. They have one common goal: to finish the study and get corresponding certificate. Besides, achievement of this final goal is possible only with the help of the so-called achievement of intermediate goals (for instance, number of weekly seminars, monthly tests indexes and total examination marks on different subjects for definite periods of time). It is clear, that this process requires task-oriented behavior from students meaning adequate consciousness of instrumental significance of intermediate goals for achieving common expected results. Taking into account temporal parameter, two forms of the set can be indicated: prospective (orientation on result of future event) and situational (orientation on the result of current event). Thus, task-oriented behavior is the process, in which by means of situational and prospective sets in views, step by step achievement of preliminary results short and longtime occurs (that is instrumental meaning), which at least provides achievement of the final result. Besides, being the sets oriented on the solution of one and the same problem, they also are of international character.

Theoretical and experimental investigations of peculiarities of task-oriented actions, in particular, in the process of thinking, were conducted by Georgian psychologists. The subject of investigations were such essential properties of thinking as the process of generalization, subjective comprehension and corresponding denomination. The obtained results are important for detection and description of psychic mechanisms, determining formation and functioning of everyday concepts. The above mentioned works mainly concerned the detection of psychological peculiarities of different forms of judgment. It should be mentioned that for quite a definite

time little attention was paid to thinking processes. However, the situation gradually changed for better. The evidence for this are analytical and empiric investigations, in which the following questions were studied: influence of different emotional states on formal logical conclusions, intuitional comprehension of the quantitative material, in evaluative judgment, such as difference-likeness, existence of asymmetry phenomenon, the problem of generalization in modern conceptions of forming the concepts. Earlier and further investigations in fact did not take into account the most important property of the inductive thinking, i.e. specificity of probabilistic judgment (for instance, assessment of probability of successful achievement in business, expected results of surgical operation, probability of success in sport events, etc.).

Having studied the peculiarities of formal logical and psycho-logical judgments the investigators defined impersonal and personal rationality (3). Under impersonal rationality is meant cognitive activity of the human, based on normative rules worked out in formal logics and the theory of probabilities. Detection of the second form of rationality is conditioned by the following: multitude of experimental investigations concerning psychic determinants of functioning of probabilistic judgments revealed vividly the expressed tendency of ignoring the people of those logical (normative) demands which should provide optimal decision of targeted vital problems. Due to that subject in experimental conditions usually accept “illogical” decisions. Generally speaking, people in real vital situations do definite conclusions basing on their own needs, beliefs, value attitudes and aims.

Probabilistic judgments appear in the conditions of uncertainty, i.e., in the situations in which there are no strict normative limitations in possible choice. In formal logical reasoning criterion of objective truth has decisive meaning, and in case of probabilistic conclusion from psychological point of view the degree of subjective confidence of a human in validity of his choice is essential. On the basis of multitude psychological investigations concerning probabilistic judgments, a general conclusion can be formulated: when predicting, people do not use principles of theory probabilities, but they use cognitive heuristic rules. Heuristics are simple and often quite approximate strategies for solution of that or other problem [4].

These strategies are less accurate than principles of theory of probabilities, and their application does not always make a good choice. However, they have one advantage: they are simple and do not require great mental consumption. The investigations show that the use of heuristic strategies often leads to specific erroneous decisions. The examples of such decisions can be the effects of representativeness, psychological accessibility and word framing alternatives. Using the rule of representativeness, people doing their choice ascertain level of comparison between events, sampling

and population in which it is kept. The event is more representative, the more it remembered population. Besides, often the reason of erroneous decision is misunderstanding of the fact that combination of two events (conjunctive judgment) cannot have bigger probability than each event separately. When solving this or other problem, people often are oriented by strategy of psychological accessibility according to which, the event is more probabilistic and it is easier and faster stamped in the memory. The application by people of the given heuristic strategy explains why evident and bright descriptions of the events are more convincing for people than real statistic data; such tendency is mainly explained due to their rules of disagreement with ordinary knowledge an intuition of human. An important factor which influences effectiveness of choice is the formulation of the problem. The erroneous choice in this case is determined by the fact that people reveal the tendency of giving different responses on differently formulated, but logical identical problems. This effect well explains the so called “conception of perspective” according to which, people usually reveal the tendency of risk avoidance. Consequently, while adopting the decision they consider any possible loses as more unacceptable than equivalent profit they would like to get (5).

### **Experimental investigation**

Basing on the above mentioned theoretical assumption and considering the existing empiric data, we conducted the investigation the aim of which consisted of comparative study of impact of prospective and situational sets on probabilistic judgments taking into account the feedback factor. In the given case indicated forms of sets are independent variables. The correctness of choice (judgment) and subjective confidence are dependence variables.

### **Procedure of the investigation**

The participants of the experimental study were 144 students of one private university in Tbilisi. During one semester (the course “Organizational Psychology”) two questionnaires were conducted with two-month intervals. Respondents were divided into one control and two experimental groups. On the first stage of investigation, the respondents of one of the experimental groups were told that some questions in every week questionnaire were given as “problems-exercises” and their understanding and given responses would by all means contribute to learning teaching materials. Besides, it was underlined that special attention in the teaching program itself is given to fulfillment of this task for the final mark on the studied subject (formation prospective set). The respondents of other experimental group were told that the responses on the given questions reflected quick wittedness and skills to

solve particular problems (formation of situational set). The probabilistic judgments of the participants of the control group were tested twice: the first and second questionnaires.

### **The material used in experimental groups**

The material used in the first and second questionnaires consisted of similar heuristic effects. Here we give some examples (in each questionnaire every respondent received 45 of topical different items). (1): X worker at the plant is 40 years old. He is a devoted family man highly appreciating friendship. He was an active participant of the movement for human rights, took part in the demonstrations against discrimination laws. The question: what is the probability of that a) X engineer at the plant; b) X engineer at plant and active member for human rights movements? (Effect of representativeness). (2): Where are more people living: in Italy or Australia? (Effect of psychological accessibility). (3): The respondent is given the description of the following situation: a man must decide to do or not to do surgical operation and he address to two doctors for help. One of them in the process of examination informs him that only 10% of people die during such an operation. The other doctor informs him that 90% patients survive after this operation. The respondent must determine which variant of two arguments will influence more the agreement of the patient to do the operation (effect of word formulation of alternatives).

### **The obtained empirical results**

1. Let us address to data of primary indexes taking into account the data of three groups tested in the experiment. General result indicates that most of the participants of the experiment had cognitive mistakes. At the same time, the data of secondary questionnaire indicates that respondents with prospective set due to significant decrease of the quantity cognitive mistakes and really improved quality of their probabilistic judgment. For instance, the difference between control and the group of prospective set was statistically reliable, 32% ( $P < 0.01$ ). Significant difference between indexes of experimental groups which is 19 % ( $P < 0.02$ ) is worth paying attention to.

2. According to the obtained indexes of confidence respondents in probabilistic judgments statistically significant differences between prospective and situational set groups in both inquiries are equal to 0.54 ( $P < 0.01$ ) and 0.48 ( $P < 0.01$ ). Fulfilling the same task, respondents of experimental groups evaluated dignity in correctness of their decisions differently. Oriented on the situation respondents revealed more dignity in their decisions than oriented on the future. For instance, participants of the group in their probabilistic judgments reflecting the effect of heuristic representativeness based on clearness of the perceived information without

“any critics.” The other tendency is observed in participants of prospective set group. They are less confident in their own decisions, cautious and are not tempted to straight adoption of decision.

## **Conclusion**

Most of the participants of the experiment in probabilistic judgments revealed tendentiousness relevant to heuristics of representativeness, psychological accessibility and forming of the chosen alternatives. The indicated forms of tendentiousness compared to respondents having situational sets were relevant to the respondents with prospective sets in less degree.

Significant differences between indexes of dignity in experimental groups was detected: oriented on situation respondents compared to oriented on future revealed more dignity in correctness of their decisions. This indicates really underserved self-dignity of the respondents of the first group and more realistic assessment of the attempts of the participants of the second group.

The obtained data show that probabilistic judgments in everyday and nonstandard (of course, and in experimental conditions) are far from strictly logical construction. However, it does not exclude its possibility of improvement of their quality as the construction of conditions contributing to reconstruction of conditions contributing to construction of erroneous cognitive activity can give positive result. The following should be taken into account: in the conditions of uncertainty of intentional evaluation of social personal phenomena, as, for instance, the possibility of breaking of the wear, profitable investment to that or other events, repentance of criminal, are meant. There are no objective assessment criteria in this cases. The most important is that probabilistic judgment determines targeted behavior and the process of decision making. That is why investigation of the efficiency of probabilistic judgment stays acute problem even in the future.

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