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## INDIVIDUAL DIFFERENCES IN RISK PERCEPTION

**Abstract:** Research in the field of risk perception for decades has gained the attention of academics from various disciplines such as psychology, economics, environmental sciences, medicine, etc. Nowadays risk perception is considered an important part of risk management. The understanding of risk perceptions or factors that influence risk perception has a direct impact on the financial and social well-being of an individual or even of society. Further understanding of how individuals are involved in decisions under risk conditions will help identify mechanisms that can lead towards an effective decision-making process. Referring to the field of natural disasters understanding of risk perception can help the decision-making process and the design of efficient national disaster plans and policies that would address the need of the population and their expected reaction to disaster events. This lecture will present a literature review about factors that affect risk perception.

**Key words:** risk perception, heuristic, sociodemographic, disasters and environmental risks, Albania

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## **INTRODUCTION**

Research in the field of risk perception for decades has gained the attention of academics from various disciplines such as psychology, economics, environmental sciences, medicine, etc. Nowadays risk perception is considered an important part of risk management. The question that arises in many studies is whether capital and risk management funds should be allocated based on individuals' perceptions or we should refer to the recommendations and assessments made by experts in the relevant field?

The understanding of risk perceptions or factors that influence risk perception has a direct impact on the financial and social well-being of an individual or even of society. Further understanding how individuals are involved in decisions under risk conditions will help identify mechanisms that can lead towards an effective decision-making process. Identifying individuals who are likely to take risks will improve risk communication by addressing them with tailored messages that emphasize the goals and values that are essential to them. Understanding risk perception for both individuals and decision makers regulates the focus of society and has a very significant effect on how resources will be distributed throughout society today (Pidgeon, 1998).

As the years go by, the world is increasingly exposed to instability and risks (Coleman, 2006). If we take a look at the daily news, we will be faced with numerous reports of natural disasters such as hurricanes, earthquakes, floods, fires, wars, terrorism, diseases, etc.. Over the past half-century an increased damage to property, infrastructure and loss of life highlights the need for understanding risk perceptions of catastrophic hazards in order for individuals, households, communities and policy makers to get better prepared for disasters. Referring to the field of natural disasters understanding of risk perception can help the decision-making process and the design of efficient national disaster plans and policies that would address the need of the population and their expected reaction to disaster events. The authors (Slovic, Fischhoff, & Lichtenstein, 1982) declare: *“Without a firm understanding of how people perceive and react to risks, however, there is no way of knowing what sort of disaster-insurance program would be most effective.”*

The first part of this lecture will offer a short overview about the importance of risk perception in the field of risk management. After that it will be proceeded with an introduction to the key paradigms of risk perception to demonstrate the importance of risk perception. Given that environmental issues are closely linked to several natural disasters, particular attention will be paid to the perception of environmental risk and the heuristics that often guide us in our decision-making process. The final part of the lecture will present a case study about disaster risk perception focused on Albanian flood prone areas.

### **1. RISK PERCEPTION**

‘Risk perception’ refers to people’s subjective judgement about the felt likelihood of encountering hazards that is associated with some situations, events, activities, or technology,

when objective information is minimal. The sources of information where the risk perception is based, are influenced by internal factors such as gender, ethnicity, socioeconomic status, emotions, culture that are far from being objective evidence of actual risk (Slovic, 1987; Morgan et al., 2001).

Unknown risks, involuntary, and rare events, are considered more life-threatening than common causes (Slovic, Fischhoff, & Lichtenstein, 1982). These non-objective perceptions of risk are transmitted to individuals in their cultural groups, causing panic about a risky event which does not pose a realistic threat. It is observed that the public perception of risk is a decisive factor that influences the spending priorities of government more than actual risks identified by experts. Data from past events and annual mortality statistics are some of the objective sources on which the experts estimate the actual risks. However, it is the individual experience and socialcultural factors of the community in which he/she lives that affect risk perception far more than objective evidence. As a result these factors lead to biases in risk perception. As a conclusion it should be underlined that one's worldview and perception of risk are observed to be the major drivers of disaster planning

## **1.1 The paradigms of Risk Perception**

Risk perception research has concentrated on three broad paradigms

### **1. The psychometric paradigm focuses on individual cognitive characteristics that quantify and predict risk.**

In their 1978 paper “How Safe is Safe Enough?,” Fischhoff, Slovic, Lichtenstein, Read, and Combs used a psychometric analysis to help explain why different technologies and activities might inspire such different risk reactions. In this “expressed preference” approach to risk perception, Fischhoff et al. shows that perceptions of risk for everyday activities and technologies tend to load onto two orthogonal dimensions, which they called dread risk and unknown risk.

The consequences caused by dread risk are likely to be catastrophic, fatal and even dreaded on a gut level. At what degree people exaggerate or minimize risk is defined by the two related factors: catastrophic potential and perceived control of risk. Referring to a specific hazard it has been observed that people's reaction depends on the level of dread and lack of control. If they get higher then the sense of people's perceived risk as well as their concern about an anticipated event increase. The dread and lack of control have been the two successful factors which have enabled the prediction of risk distortion in different anticipated hazards, and as a result the government can develop and apply supported risk prevention and anti-terrorism programs.

### **2 The social amplification of risk framework (SARF)**

With the purpose of explaining the process of how a hazardous event has direct and indirect societal impact it was developed SARF in 1988 (Kasperson, Renn, & Slovic, 1988). It is stated that the experience of risk goes beyond the concrete objective event and it consists of different social and psychological processes which occur during a period of time. This process contributes in analysing the risk, description of the content of the event and the

following social change. The framework includes a number of steps such as the concrete physical event and its recognition, the list of the individuals or groups who define the actual components of the risk to be encoded and explained (Renn , Burn , Kasperson , Kasperson , & Slovic, 1992). On the basis of these detailed descriptions the messages are compiled and conveyed to others who become “amplification stations” that spread or amplify the message through various communication channels. Individuals, media and cultural and political groups comprise the amplification stations. On the one hand amplification is the process by which the analysts consider the risk unlikely to occur, however, it has major secondary consequences. On the other hand if no sufficient public concern and attention is given to a serious risk then attenuation occurs.

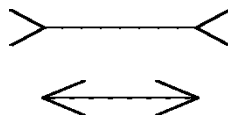
### 3 Cultural paradigm

In the researches about disaster the process of implementation of norms, values, and cultural practices within a group of people comprise cultural approach (Douglas & Wildavsky, 1982). Essentially the focus of interest are culturally distinct subgroups and groups (including whole nations) and the way their beliefs and practices referring to risk are introduced and considered by people in those groups. However, instead of focusing on the risk perception for a given hazard encountered by a specific population, attention in this field has been addressed on what a general population perceives a hazard. This approach is considered as oversocialised as the specific relationships are ignored given that it is the society which organically spreads thoughts and behaviours.

## 2 HEURISTICS AND BIASES IN RISK JUDGEMENTS

Description of Heuristics in the Longman Dictionary of Contemporary English (2013) refers to the study of how people use their experience to find answers to questions that arise or to improve their skills. It has been argued that people are unable to perceive, receive, and process information; as a result, psychologists claim that such limitations lead to biased judgments and heuristics are an example of them. Heuristics can be described as a quick way or a shortcut to more efficient judgments that the human mind uses to quickly solve complex problems. Heuristics contains powerful and useful problem-solving tools. However, when used where it is not necessary, it can lead to systematic mental errors. Optical illusions are a simple way of illustrating heuristics. Let's look at an example from the following figure:

Figure 1: Which of the two segments is longer?



The answer is that the first segment (above) looks longer. In fact, both segments have the same length. Here we notice the effect of an optical illusion. In this case, our minds fall into the trap of thinking that the first line is closer to the eye than it really is. This is due to the visual effect of the arrows. It should be noted that for this optical illusion as well as for others, even though we are aware of the fact that segments have the same length, we still perceive

them as having different lengths. Heuristics that have evolved over the years can be thought of as the central unit of the brain (hardware). But unlike programs, heuristics are such an important tool that cannot be reprogrammed. Just as optical illusion illustrated heuristics, when used wrongly, can cause mental errors, in the case of the risk management process, heuristics can make individuals perceive risk with a wrong probability, by overestimating or underestimating it. People use different heuristics in problem solving (Ackert & Deaves, 2009). This section will focus on some of the heuristics that are closely related to the most common mental errors, or errors in judgments made by people referring to environmental risk perception.

Two heuristics that influence biased risk assessment are *availability heuristic* and the *anchoring and -adjustment heuristic* (Tversky & Kahneman, 1974). These two heuristics lead people to overestimating the small frequencies and underestimating the larger ones when judging the frequency of different risks. *Availability heuristic* indicates that events that are easily perceived by the mind are more likely to occur (Kahneman, 2003). For example, our subjective probability of a car accident increases when we see a car crashed on the side of the road. An example referring to the environmental risks provided by one study showed that people were more concerned about global warming on days warmer than usual (Li, Johnson, & Zaval, 2011). The frequency of an event leads people to exaggerate the likelihood of its occurrence. Therefore, media coverage of an accident or catastrophic event may affect the perceived probability.

*The anchoring-and-adjustment heuristic* refers to the fact that, when making estimates, people often start out from a reference point that is salient in the situation (the anchor) and then adjust this first estimate to arrive at a final judgement. In most cases, the adjustment is insufficient, and the final estimates are biased towards the anchor.

A factor that powerfully shapes risk evaluations is the framing of a problem. Framing effects refer to the finding that different descriptions of otherwise identical problems can alter people's decisions (Tversky & Kahneman, 1981). Simple changes in wording – such as describing outcomes in terms of losses versus gains – can lead to different preferences. For example, people perceived environmental problems (e.g. river quality, air quality) as more important when the opportunity of restoring a previous better state (i.e. undoing a loss), rather than improving the current state (i.e. producing a gain), was given (Gregory et al. 1993 cited at Steg & de Groot, 2018).

### **3 SOCIO DEMOGRAPHIC FACTORS THAT AFFECT RISK PERCEPTION**

Personal factors have been largely addressed by literature. They include factors such as: age, gender, educational level, profession, stakeholder membership, personal knowledge, personal disaster experience, trust in authorities, trust in experts, confidence in different risk reduction measures, involvement in post-disaster recovery action, world views, degree of control, religiousness, etc. Interesting findings have been produced by international literature in relation to these factors. It is common understanding for example that women, perceive a higher level of risk. Miceli, Sotgiu, & Settanni (2008) have confirmed this in their research, while studying the impact of age and gender on disaster risk perception. They state that women are less tolerant of the risk of natural disasters than men, while older ages are more

tolerant. Armas (2007) shows that grown-ups and individuals with higher levels of education are less tolerant of natural risk, while finding that income was not statistically significant in his study. Income, on the other hand, has been found to affect disaster risk tolerance in Baan & Klijn (2004) study. They find that the increase in family income reduces the tolerance of individuals to natural risk. Religion and belief is also addressed in the literature. Some people for example attribute responsibility for disaster events to a higher power or authority, such as God, destiny or national government (Development Initiatives, 2017). In other cases, disaster risk was found to become part of the identity of an individual or community. In such cases they would accept to coexist with danger, even by developing an emotional connection with it, thus neglecting the serious consequences of this disaster (Alam, 2016). This was the case of people in living in Yungay, Peru, who do not want to move from their homeland despite the high earthquake risk (Armaş, 2007). Finally, context factors, such as economic factors, vulnerability indices, home ownership, family status, country and area of living, closeness to the waterfront, size of community, age of the youngest child, also affect the way risk is perceived by the population (Heitz et.al, 2009).

#### **4 CASE STUDY: THE SOCIO-ECONOMIC AND CULTURAL CONTEXT OF INFORMATION, COMMUNICATION, PREPARATION AND ATTITUDE TOWARDS NATURAL HAZARDS IN ALBANIA**

The study conducted by (Pojani & Hudhra, 2018) tried to understand the level of awareness of disaster risk, and the factors that affect risk perception. In addition, the link between disaster risk perception and risk communication have been addressed. This case study used both qualitative and quantitative data analysis. Four flood prone areas of Albania have been chosen for this purpose: Dajç area in Northern Albania, Fier and Novosela area in South Albania, and Lana's river zone in Tirana (Central Albania). Both observation and semi-structured interviews were used in the process of collecting primary data, and public reports review was used to triangulate the findings. With the aim of being closer to the affected population world and better understanding of their behavior and responses, face-to-face interviews were conducted. A total of 104 interviews were completed. The interview consisted of 68 questions divided into 4 sections

The qualitative and quantitative analysis done in this study produced some very important findings in relation to risk attitude of Albanian population living in the study areas.

- Families with higher monthly incomes are the ones that are more likely to avoid the risk of natural disasters, so they are more willing to take action to combat the phenomenon and natural risk. Measures such as improving housing conditions to protect against floods, willingness to pay specific flood tax, readiness to leave the risk area, willingness to attend pre-disaster training, saving for emergency situations, etc., are some of the examples of disaster risk response of the population.
- Unmarried respondents are more tolerant of risk, and this is normal because it relates to the much fewer responsibilities they have, compared to married ones.
- As the level of education increases, the tolerance of individuals to the risk of natural disasters decreases. This is logical because as the more knowledge becomes available, the

more the tendency to avoid disasters increases. This conclusion is also related to the literature studied (Armas, 2007). Age also has the same relation as education with tolerance to natural hazards.

- Emotional bonds with property, trust in major forces, the number of previous experiences with floods have definitely influenced the perception they have on natural risk.

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### **REVIEW QUESTIONS**

1. Explain why risk perception plays an important role in the human response to natural and man-made disasters?
2. What are the implications for a nonobjective and distorted risk perception?
3. List three demographic variables that play a role in risk perception.
4. How availability heuristic impacts the judgment of the environmental risk?
5. What is the focus of the psychometric paradigm? Give an example for a dread risk and unknow risk.
6. Describe the phases of the social amplification of risk framework.

