
Perceiving Risk Perception: An Analysis of Risk Perception Research and Discussion of Its Policy Implications

A. BURCU BAYRAM^a

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Abstract: Turkey is a country of risks. From terrorism to natural disasters, various risks surround the country and its people. It is, however, astonishing that the risk perception literature has not been sufficiently integrated into Turkish social sciences. This article realizes two main objectives. Firstly, it provides a comprehensive analytical review of the research on risk perception. Secondly, it discusses the political and administrative implications arising out of risk perception research and offers recommendations to government officials on public policy and risk communication. The principal contribution of this article is to propose risk perception as an efficient and politically relevant scientific field of research and encourage scientists and politicians to attach more importance to this field.

Keywords: Risk perception, risk communication, public policy, social sciences, Turkish social sciences.

^a The University of Texas at Arlington, College of Liberal Arts, Department of Political Science | abbayram@uta.edu

Risk Algısını Anlamak: Risk Algısı Çalışmalarının İncelenmesi ve Siyasi Sonuçlarının Tartışılması

A. BURCU BAYRAM

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Öz: Türkiye bir riskler ülkesi. Terörizmden doğal afetlere, birçok risk ülkeyi ve insanlarını çevrelemekte. Ancak oldukça şaşırtıcıdır ki, risk algısı literatürü Türk sosyal bilimlerine yeterli ölçüde entegre olmamıştır. Bu makale iki temel amacı gerçekleştirmektedir. Öncelikle, risk algısı araştırmalarının kapsamlı ve analitik incelemesini sunar. İkinci olarak, risk algısı araştırmalarından çıkan siyasi ve idari sonuçları tartışarak, devlet yetkililerine kamu politikaları ve risk iletişimi hakkında öneriler getirir. Bu makalenin başlıca katkısı risk algısını verimli ve siyasi önem taşıyan bir bilimsel araştırma sahası olarak ileri sürmek ve bilim insanları ve siyasetçileri bu sahaya daha çok önem vermeye teşvik etmektir.

Anahtar Kelimeler: Risk algısı, risk iletişimi, kamu politikaları, social sciences, Türk sosyal bilimleri.

Introduction

Turkey is a country of risks. From terrorism to natural disasters, various risks surround the country and its people. It is, however, astonishing that the risk perception literature has not been sufficiently integrated into Turkish social sciences. In the Turkish academy, risk perception research has gained momentum in recent years in medicine and health,¹ psychology,² and economics and business administration³. Nevertheless, risk perception studies in social sciences, particularly in political science, public policy, and sociology are notably rare.⁴ Both the policy implications and the theoretical importance of discoveries on risk perception are yet to be appreciated.

This article realizes two main objectives. Firstly, it provides a comprehensive analytical review of the psychological research on risk perception in order to facilitate more social science research

¹ See for instance Esin Ceber, Meral Turk Soyer, Meltem Ciceklioglu, and Sunduz Cimat, "Breast Cancer Risk Assessment and Risk Perception on Nurses and Midwives in Bornova Health District in Turkey", *Cancer Nursing* 29 (3), 2006, p. 244-249; Ebru Turhan, Yusuf Inandi, and Tacettin Inandi, "Risk Perception, Knowledge and Social Distance of Turkish High School Students about HIV/AIDS", *Journal of Public Health* 28 (2), 2006, p. 137-138; Hulya Akan, Yesim Gurol, Guldal Izbirak, Sukran Ozdatli, Gulden Yilmaz, Ayca Vitrinel, and Osman Hayran, "Knowledge and Attitudes of University Students toward Pandemic Influenza: a Cross-Sectional Study from Turkey", *BMC Public Health* 10 (1), 2010, p. 413-421.

² See for instance Özlem Şimşekoğlu, Trond Nordfjærn, and Torbjørn Rundmo, "Traffic Risk Perception, Road Safety Attitudes, and Behaviors among Road Users: a Comparison of Turkey and Norway", *Journal of Risk Research* 15 (7), (2012), p. 787-800; Sengul Hablemitoglu and Filiz Yildirim, "The Relationship between Perception of Risk and Decision Making Styles of Turkish University Students: A Descriptive Study of Individual Differences", *World Applied Sciences Journal* 4 (2), 2008, p. 214-224; Ahmet Rüstemli and A. Nuray Karanci, "Correlates of Earthquake Cognitions and Preparedness Behavior in a Victimized Population", *The Journal of Social Psychology* 139 (1), 1999, p. 91-101.

³ Fahri Apaydın and Mehmet Emir Köksal, "Turkish Consumers' Risk Perception towards Global Computer Brands", *International Journal of Marketing Studies* 3 (3), 2011, p. 165-173; Atıla Yüksel and Fisun Yüksel, "Shopping Risk Perceptions: Effects on Tourists' Emotions, Satisfaction and Expressed Loyalty Intentions", *Tourism Management* 28 (3), 2007, p. 703-713; Ozlem Ozdemir and Cengiz Yilmaz, "Factors Affecting Risk Mitigation Revisited: The Case of Earthquake in Turkey", *Journal of Risk Research* 14 (1), 2011, p. 17-46.

⁴ For an exception, see Gökhan Orhan, "The Politics of Risk Perception in Turkey: Discourse Coalitions in the Case of the Bergama Gold Mine Dispute", *Policy & Politics* 34 (4), 2006, p. 691-710.

by Turkish academics. Secondly, it outlines the policy implications of taking risk perception research seriously and offers recommendations to government officials on public policy and risk communication.

Risk perception refers to individuals' subjective understandings of risks. For decades, researchers have persuasively established that humans' subjective assessments of risks diverge from mathematical calculations of risks.⁵ Consider this example. Even though the Marmara Sea area is a high seismic activity-zone, the risk that a resident of İstanbul will die in an earthquake is mathematically lower relative to the risk that he or she will die in a car accident. However, residents of İstanbul are highly comfortable with driving but terrified of being hit by an earthquake. Why? The reason is that humans do not process and react to risks objectively. They have subjective beliefs about risks that do not match technical estimates of risks.

Understanding the factors that shape individuals' perception of risks is critical. Risk perceptions influence people's political and social attitudes and behaviors, their policy priorities, and expectations from government officials. To illustrate, it is not the actual mathematical estimate of another mining accident such as the one that took place in Soma in 2014, but the public's perception of mining accident risks that drives citizens' concerns and demands from politicians. It is not the actual risk of the Akkuyu nuclear power plant that anchors the public opposition to this project, but

⁵ Ali Siddiq Alhakami and Paul Slovic, "A Psychological Study of the Inverse Relationship between Perceived Risk and Perceived Benefit", *Risk Analysis* 14 (6), 1994, p. 1085-1096; Asa Boholm, "Comparative Studies of Risk Perception: A Review of Twenty Years of Research", *Journal of Risk Research* 1 (2), 1998, p. 135-163; Baruch Fischhoff, Paul Slovic, Sarah Lichtenstein, Stephen Read, and Barbara Combs, "How Safe is Safe Enough? A Psychometric Study of Attitudes towards Technological Risks and Benefits", *Policy Sciences* 9 (2), 1978, p. 127-152; Ortwin Renn and Bernd Rohrman, *Cross-Cultural Risk Perception: A Survey of Empirical Studies*, The Netherlands: Kluwer, 2000; Paul Slovic, "Perception of Risk", *Science* 236 (4799), 1987, p. 280-285; Lennart Sjöberg, "Factors in Risk Perception", *Risk Analysis* 20 (1), 2000, p. 1-11; Katherine V. Kortenkamp and Colleen F. Moore, "Psychology of Risk Perception", *Wiley Encyclopedia of Operations Research and Management Science*, 2011, p. 1-8, DOI: 10.1002/9780470400531.corms0689, Accessed Date: 01.06.2015.

citizens' subjective beliefs about nuclear risks. What are the factors that affect how people perceive risks? Why do individuals' subjective assessments of risks differ from mathematical risk estimates? How can politicians better communicate risks to citizens? This article sheds light on these questions.

The following discussion consists of four parts. Firstly, I introduce the terms "risk" and "risk perception", and outline the historical origins of risk perception research. I then present the psychological findings on the core determinants of people's risk perceptions, introducing the availability and affect heuristics and the psychometric paradigm. The third section lays out the implications of existing discoveries for public policy and risk communication. I conclude by summarizing the main contribution of this study and by suggesting avenues of future research for Turkish social scientists.

1. Risk and Risk Perception

The concept of risk has long attracted the attention of scholars from various disciplines, including medicine, engineering, economics, information technology, and psychology. Numerous definitions of risk have been offered. Short, for example, defines risk as the likelihood that a person will experience some danger.⁶ Rosa defines risk as "a situation or event in which something that is valuable to human beings (including human life itself) is at stake, and where the outcome is uncertain."⁷ Conceptualizations of risk are also party context-specific.⁸ In medicine, for instance, risk is associated with the probability of an illness and the number of

⁶ James F. Short, "The Social Fabric of Risk: Toward the Social Transformation of Risk Analysis", *American Sociological Review* 49 (6), 1984, p. 711-25; James F. Short, "On Defining, Describing, and Explaining Elephants (and Reactions to Them): Hazards, Disasters, and Risk Analysis", *Mass Emergencies and Disasters* 7(3), 1989, p. 397-418.

⁷ Eugene A. Rosa, "The Logical Structure of the Social Amplification of Risk Framework (SARF): Metatheoretical Foundations and Policy Implications", *The Social Amplification of Risk*, ed. Nick Pidgeon, Roger E. Kasperson, Paul Slovic, Cambridge: Cambridge University Press, 2003, p. 47-80.

⁸ Renn/Rohrmann, *Cross-Cultural Risk Perception*; Regina E. Lundgren and Andrea H. McMakin, *Risk Communication: A Handbook for Communicating Environmental, Safety, and Health Risks*, New Jersey: John Wiley & Sons, 2013.

fatalities that might result from it. In economics and management, risk can be used to capture both the advantages and disadvantages associated with a policy or innovation. Risky business investments, for instance, are considered to be uncertain but high-profit opportunities.

Despite the plethora of definitions, scholars generally agree that risk consists of two factors: the probability of a dangerous event and the magnitude of the consequences of that event.⁹ Therefore, as Adams explains, risk equals the probability of an adverse event multiplied by the magnitude of its harmful consequences.¹⁰ What this conventional wisdom implies is that risk exists when the probability of a dangerous outcome is known and the consequences of this outcome can be quantified.

Contrast risk with uncertainty. Because the probabilities and the magnitude of harm are known, risk can be measured and calculated. Uncertainty, however, cannot be calculated because the probabilities are not known. As Knight famously put it, uncertainty is immeasurable danger; risk is measurable danger.¹¹

Feed them the necessary information, and computers can objectively calculate risks. With sufficient mental effort, humans can do it as well. Calculate, that is. Give them the probability of a threat and magnitude of the adverse effects of that threat people too can derive a mathematical estimate of risk. But do they really understand risk estimates? Do humans comprehend that risk means probability times magnitude?

The short answer is “no.” The longer answer is “maybe, although with great difficulty.” Lay people, and even experts sometimes, do not objectively process risk. This is because risk is a sub-

⁹ John Adams, *Risk*, London: UCL Press, 1995; Terje Aven, Ortwin Renn, and Eugene A. Rosa, “On the Ontological Status of the Concept of Risk”, *Safety Science* 49 (8), 2011, p. 1074-1079; Stanley Kaplan and B. John Garrick, “On the Quantitative Definition of Risk”, *Risk Analysis* 1 (1), 1981, p. 11-27; Steve Rayner and Robin Cantor, “How Fair Is Safe Enough? The Cultural Approach to Societal Technology Choice”, *Risk Analysis* 7 (1), 1987, p. 3-9.

¹⁰ Adams, *Risk*, 69.

¹¹ Frank H. Knight, *Risk, Uncertainty and Profit*, New York: Dover, 2012.

jective construct.¹² As renowned scholar Paul Slovic explains “[r]isk does not exist ‘out there’, independent of our minds and cultures, waiting to be measured...There is no such thing as ‘real risk or ‘objective risk’ ”.¹³ In short, risk is in the eye of the beholder.

Risk perception refers to the subjective assessment of risks. It is defined as the “subjective assessment of the probability of a specified type of accident happening and how concerned we are with the consequences.”¹⁴ Risk perception includes individuals’ psychological evaluations of the probability and the consequences of a dangerous outcome. Simply put, risk perception is about how we think and feel about an adverse outcome.¹⁵

Risk perception became an important construct in the 1960s. The catalyst for risk perception studies was advancements in nuclear and chemical technology.¹⁶ The public opposition to these technologies in Europe and the United States puzzled scholars, policy makers, and industry leaders.¹⁷ Why were people not worried about smoking or driving cars but terrified of nuclear plants or radiation even though the risks associated with the former are significantly lower than those associated with the latter? It was psychologists who addressed this puzzle: Humans do not objec-

¹² Nick Pidgeon, Christopher Hood, David Jones, Barry Turner, and Rose Gibson, “Risk Perception”, *Risk: Analysis, Perception and Management: Report of a Royal Society Study Group*, London: Royal Society, 1992, p. 89-134; Paul Slovic, “Perception of Risk: Reflections on the Psychometric Paradigm”, *Social Theories of Risk*, ed. Sheldon Krinsky and Dominic Golding, New York: Praeger 1992, p. 117-152; Sheldon Krinsky and Dominic Golding, *Social Theories of Risk*, Westport, CT: Praeger-Greenwood, 1992.

¹³ Slovic, “Perception of Risk”, p. 119.

¹⁴ Lennart Sjöberg, Björg-Elin Moen, and Torbjørn Rundmo, “Explaining Risk Perception: An Evaluation of the Psychometric Paradigm in Risk Perception Research”, Trondheim: Runde, 2004, p. 8.

¹⁵ Slovic, “Perception of Risk”; Paul Slovic, “The Risk Game”, *Journal of Hazardous Materials* 86 (1), 2001, p. 17-24; Paul Slovic, “Trust, Emotion, Sex, Politics, and Science: Surveying the Risk-Assessment Battlefield”, *Risk Analysis* 19(4), 1999, p. 689-701.

¹⁶ Allan Mazur, *The Dynamics of Technical Controversy*, Washington, DC: Communications Press, 1981.

¹⁷ F. D. Sowby, “Radiation and Other Risks”, *Health Physics* 11 (9), 1965, p. 879-887; Chauncey Starr, “Social Benefit Versus Technological Risk”, *Readings in Risk*, ed. Theodore S. Glickman, Michael Gough, New York: Resources for the Future, 1990, p. 183-193.

tively understand, assess, and react to risks. They process risks subjectively. From the 1970s onwards, psychologists have devoted considerable attention to the study of risk perception and identified three main determinants of perceived risk.

2. Main Determinants of Perceived Risk

2.1. The Availability Heuristic

In 1956, Herbert Simon developed the notion of bounded rationality, asserting that there are cognitive limitations on individuals' ability to make decisions as the normative rational choice model suggests. Building upon Simon, Nobel Prize winners Tversky and Kahneman demonstrated that humans rely on heuristics to simplify complex decision tasks.¹⁸

Heuristics are cognitive rules of thumb that people use to make decisions quickly, solve problems efficiently, and comprehend ambiguous situations. Heuristics facilitate decision-making and problem solving by reducing the burden on the brain associated with these tasks.¹⁹ We all use heuristics all the time (e.g. making tea in the morning without thinking about it is an example of heuristic use). Yet heuristics can result in cognitive biases, leading to misunderstanding of risks.

Scholars have discovered that the availability heuristic is most closely linked to subjective risk assessments and distortions of mathematical probabilities. Availability refers to the ease with which relevant events come to mind. Tversky and Kahneman showed that the use of the availability heuristic generates systematic biases in humans' understanding of risks.²⁰

¹⁸ Amos Tversky and Daniel Kahneman, "Availability: A Heuristic for Judging Frequency and Probability", *Cognitive Psychology* 5 (2), 1973, p. 207-232; Amos Tversky and Daniel Kahneman, "Judgment under Uncertainty: Heuristics and Biases", *Science* 185 (4157), 1974, p. 1124-1131; Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decisions under Risk", *Econometrica* 47 (2), 1979, p.313-327. Daniel Kahneman and Amos Tversky, "Choices, Values, and Frames", *American Psychologist* 39 (4), 1984, p. 341-350.

¹⁹ Tversky/Kahneman, "Judgment under Uncertainty"; Thomas Gilovich, Dale Griffin, and Daniel Kahneman *Heuristics and Biases: The Psychology of Intuitive Judgment*, Cambridge: Cambridge University Press, 2002.

²⁰ Tversky/Kahneman, "Availability".

The availability heuristic distorts risk assessments because it leads individuals to assign a higher subjective probability to a disproportionately remembered or salient event. Events such as terrorist attacks, natural disasters, airplane crashes are considerably rare compared to car accidents or alcoholism related deaths. For example, the average person is 35 thousand times more likely to die from a heart attack than from a terrorist attack.²¹ But rare catastrophic events are never forgotten. Because they are readily available in people's minds, these occurrences are perceived to be high-risk events.²² As a result of the availability heuristic, the probabilities of rare risk events are over-blown in peoples' minds.

2.2. Dreaded and Unknown Risks: The Psychometric Paradigm

Supported by decades of research, the psychometric paradigm is the most influential of model of risk perception research.²³ The psychometric paradigm relies on three main assumptions: a) risk is inherently subjective, b) specified characteristics or attributes of risk events influence individuals' risk perceptions, and c) with appropriate experimental and survey designs, researchers can identify the factors that shape how people perceive risks. Replicated in numerous cross-cultural samples,²⁴ the findings of the psychometric model continue to shape risk management and communication policies across various policy domains and industries.

The psychometric paradigm has its roots in the 1978 study of

²¹ <http://www.washingtonsblog.com/2013/04/statistics-you-are-not-going-to-be-killed-by-terrorists.html>. Accessed Date: 01.06.2015.

²² Paul Slovic, Melissa L. Finucane, Ellen Peters, and Donald G. MacGregor, "Risk as Analysis and Risk as Feelings: Some Thoughts about Affect, Reason, Risk, and Rationality", *Risk Analysis* 24 (2), 2004, p. 311-322; Paul Slovic, Baruch Fischhoff, and Sarah Lichtenstein, "Facts and Fears: Understanding Perceived Risk", *Societal Risk Assessment: How Safe is Safe Enough?*, ed. Richard C. Schwing, Walter A. Albers, New York: Springer, 1980, p. 181-216; Valerie S. Folkes, "The Availability Heuristic and Perceived Risk", *Journal of Consumer Research* 15 (1), 1988, p. 13-23; John B.F. De Wit, Enny Das, and Raymond Vet, "What Works Best: Objective Statistics or a Personal Testimonial? An Assessment of the Persuasive Effects of Different Types of Message Evidence on Risk Perception", *Health Psychology* 27 (1), 2008, p.110-115.

²³ Slovic, "Perception of Risk"; Slovic, "Perception of Risk"; Fischhoff/Slovic/Lichtenstein/Read/Combs, "How Safe is Safe Enough?"

²⁴ Renn/Rohrmann, *Cross-Cultural Risk Perception*.

Fischhoff, Slovic, Lichtenstein, Read, and Combs. The paradigm employs psychophysical scales and multivariate statistical techniques in order to quantify and analyze risk perceptions. Fischhoff, Slovic and their colleagues asked a large group of participants to rate thirty different hazards (such as nuclear power, pesticides, smoking, radiation) on nine dimensions. These dimensions included: a) voluntary or involuntary, b) chronic or catastrophic, c) common or dreaded, d) known or unknown to those exposed, e) known or unknown to science, f) immediate or delayed, g) controllable or not controllable, h) novel or old, and i) fatal or not fatal. Factor analyses of subjects' ratings revealed a two-dimensional model underlying individuals' risk judgments.

The first dimension pertains to dread. In psychometric studies, scholars discovered that people are extremely fearful of dreaded risks. Dreaded risk is defined "as perceived lack of control, dread, catastrophic potential, fatal consequences, and inequitable distribution of risks and benefits".²⁵ These risks are low-probability but high-consequence events such as nuclear accidents, terrorism or accidental HIV infection from a blood transfusion. Even though the probability of their occurrence is mathematically low, individuals see these events as acutely risky because of dread.²⁶

The second dimension of the psychometric model pertains to whether risks are known or unknown. Unknown risk refers to "hazards judged to be unobservable, unknown, new, and delayed in their manifestation of harm".²⁷ Chemical technology, genetic manipulation, and new drugs are examples of unknown risks. People are tremendously sensitive to such unknown risks because they simply do not know what kind of damage could ensue.

2.3. The Affect Heuristic

While early models largely focused on the cognitive factors

²⁵ Paul Slovic and Elke U. Weber, "Perception of Risk Posed by Extreme Events", Risk Management Strategies in an Uncertain World, Pailisades, New York, USA: April 12-13, 2002, p.1-21.

²⁶ Slovic, "Perception of Risk".

²⁷ Slovic/Weber, "Perception of Risk Posed by Extreme Events", p. 8.

that shape risk perceptions (e.g. the availability heuristic, dread, and novelty), in the mid 1990s, scholars began to pay more attention to the role emotions play in influencing individuals' understandings of risks. Building upon the broader findings in psychology on emotions or affect,²⁸ the founding fathers of the psychometric paradigm have reinterpreted some of their findings and introduced emotions into the psychometric paradigm.

First, Slovic and his colleagues argued that extreme reactions to dread risks might in part be caused by emotions. When faced with dreadful events, individuals fail to notice that these are low-probability outcomes because they are overwhelmed by negative emotions.²⁹ Second, following this claim, Finucane and colleagues developed the notion of affect heuristic.³⁰ According to this heuristic, there is an "affect pool" stored in people's mind. In this pool, events, people, behaviors and all other stimuli are associated various positive or negative emotions with varying degrees of strength. When judging the riskiness of an outcome, individuals return to the emotions saved in their mental pool associated with this outcome. Therefore, regardless of probabilities, events that evoke strong negative emotions are judged to be much riskier than others.

For example, consider the relationship between risks and benefits. On average, there is a positive correlation between risks and benefits in the world. However, psychologists have observed that in humans' mind, risks and benefits are negatively correlated. The affect heuristic has been used to explain this anomaly.³¹ Risky

²⁸ Antonio R. Damasio, *Descartes' Error: Emotion, Reason and Human Brain*, New York: Avon Press, 1994; Seymour Epstein, "Integration of the Cognitive and the Psychodynamic Unconscious", *American Psychologist* 49 (8), 1994, p. 709-724; Robert B. Zajonc, "Feeling and Thinking: Preferences Need no Inferences", *American Psychologist* 35 (2), 1980, p. 151-175.

²⁹ Ali Siddiq Alhakami and Paul Slovic, "A Psychological Study of the Inverse Relationship between Perceived Risk and Perceived Benefit", *Risk Analysis* 14(6), 1994, p. 1085-1096.

³⁰ Melissa L. Finucane, Ali Alhakami, Paul Slovic, and Stephen M. Johnson, "The Affect Heuristic in Judgments of Risks and Benefits" *Journal of Behavioral Decision Making* 13(1), 2000, p. 1-17.

³¹ Alhakami/Slovic, "A Psychological Study of the Inverse Relationship between

business investments typically promise to offer large benefits. However, in most people's minds, such investments are also tagged to big failures, including bankruptcy, and therefore evoke strong negative emotions. This explains why risky investments are falsely believed to be low-benefit by many individuals.

The affect heuristic also explains insensitivity to probabilities.³² When the repercussions of an outcome are associated with strong emotions, individuals neglect the actual probability of that outcome. Cass Sunstein, for instance, argues that the affect heuristic explains public reactions to terrorism.³³ Publics are extremely fearful of terrorist attacks even though the "actual" risk of such attacks is low.³⁴ Sunstein explains that people "fall victim" to probability neglect because terrorism evokes very strong negative emotions such as alarm and dread.³⁵ It is the emotions elicited by the terrorism that causes people to believe that terrorist attacks are highly likely. Positive emotions can also lead to probability neglect. Loewenstein and associates showed that a person's feelings regarding a big lottery prize where the chance of winning is one in ten million or one in ten thousand are the same.³⁶ It is the emotions associated with winning rather than the actual probability of winning that encourages people to buy lottery tickets despite the minuscule probability of winning. In short, the likelihood of emotional events is not judged based on their actual mathematical probability.

Perceived Risk and Perceived Benefit"; Paul Slovic, Ellen Peters, Melissa L. Finucane, and Donald G. MacGregor, "Affect, Risk, and Decision Making", *Health Psychology* 24 (4), 2005, p.35-40.

³² Yuval Rottenstreich and Ran Kivetz, "On Decision Making without Likelihood Judgment", *Organizational Behavior and Human Decision Processes* 101(1), 2006, p. 74-88.

³³ Cass R. Sunstein, "Terrorism and Probability Neglect", *The Journal of Risk and Uncertainty* 26 (2/3), 2003, p. 121-136.

³⁴ John E. Mueller, *Overblown: How Politicians and the Terrorism Industry Inflate National Security Threats, and Why We Believe Them*, New York: Free Press, Simon and Schuster, 2006.

³⁵ Sunstein, "Terrorism and Probability Neglect".

³⁶ George F. Loewenstein, Elke U. Weber, Christopher K. Hsee, and Ned Welch, "Risk as Feelings," *Psychological Bulletin* 127(2), 2001, p. 267-286.

3. Implications for Public Policy and Risk Communication

Understanding the factors that affect individuals' risk perceptions has important implications for public policy. The discoveries discussed above can help government officials better comprehend public reactions to risks and devise more effective risk communication policies.³⁷

First of all, policy makers may be able to discourage the use of cognitive heuristics. People might be less likely to rely on heuristics once they are made aware that these cognitive shortcuts can lead to faulty risk judgments. Therefore, when communicating the risks and benefits of a policy to the public, government officials would be well served to remind citizens that judging the risk of a policy based on one or two memorable events is not rational. To illustrate, it is well known that some segments of the Turkish public are extremely weary of the Akkuyu nuclear power plant project.³⁸ It is highly likely that part of the public opposition to Akkuyu is a function of the availability of the 1986 Chernobyl disaster in people's mind. By communicating to the public that Chernobyl is a low-probability event that is not representative of standard nuclear power operations, policy makers can interrupt the pattern of heuristic use.

Secondly, government officials will be well-served by demystifying novel risks. According to the United Nations High Commissioner for Refugees, Turkey has been hosting over 1.5 million Syrian refugees since the Syrian crisis began in 2011 and the number of refugees is expected to rise to 2 million in 2015.³⁹ Even though the international community continues to appreciate Turkey's open

³⁷ Nick Pidgeon, Roger E. Kasperson, and Paul Slovic, *The Social Amplification of Risk*, Cambridge: Cambridge University Press, 2003; Paul Slovic (ed.), *The Perception of Risk*, London: Routledge, 2000; Lennart Sjöberg, "Political Decisions and Public Risk Perception", *Reliability Engineering & System Safety* 72 (2), 2001, p. 115-123; Michael Power, *The Risk Management of Everything: Rethinking the Politics of Uncertainty*, London: Demos, 2004; Paul Slovic, Baruch Fischhoff, and Sarah Lichtenstein, "Why Study Risk Perception", *Risk Analysis* 2 (2), 1982, p. 83-93.

³⁸ <http://www.milliyet.com.tr/akkuyu-nukleer-santrali-nin-temeli/ekonomi/detay/2043889/default.htm>. Accessed Date: 01.06.2015.

³⁹ <http://www.unhcr.org/pages/49e48e0fa7f.html>. Accessed Date: 01.06.2015.

door policy, there is growing concern among Turkish citizens about the health and safety risks caused by the influx of refugees.⁴⁰ Partly underlying the public's concern is the novelty of the refugee risk.

How refugees will be accommodated into the Turkish society and economy in the medium and long term remains unknown to Turkish citizens. How Turkey will handle the security risks such as crime, the economic risks such as increased competition for jobs and rising unemployment, and the social risks such as civil conflict are unclear. Therefore, as predicted by the psychometric model of risks, Turks' perceptions of the refugee risk are magnified. Addressing the growing public concern thus requires two critical policy moves, educating the Turkish public about the immediate and delayed consequences of the accommodating refugees and transparently communicating the government's plans to address the refugee crisis. Both policies will make the refugee risk less obscure to the public, thereby facilitating a more nuanced understanding of the problem.

Government officials can also use the affect heuristic for improved public policy. It is obvious that smoking constitutes a threat to public health in Turkey. Contrary to the United States and Europe, smoking is still socially acceptable in Turkey. As a result, the risks of smoking do not stir up strong negative emotions among the majority of the Turkish population. Evidence from Canada, for example, suggests that the use of graphic warnings on cigarette packages and emotionally poignant anti-tobacco campaigns have decreased the rate of smoking.⁴¹ As predicted by the affect heuristic, graphic images of the health hazards caused by smoking have led citizens to associate strong negative emotions with smoking, thus increasing quit rates. By communicating the dangers of smoking or similar hazards in affectively salient ways, Turkish policy makers can alter the public's risk perceptions.

⁴⁰ See for example, <http://www.firdevstalkturkey.com/turkeys-world/syrian-refugees-become-a-potential-flashpoint-in-turkey/>. Accessed Date: 01.06.2015.

⁴¹ Slovic/Peters/Finucane/MacGregor, "Affect, Risk, and Decision Making".

Conclusion and Directions for Future Research

From political to economic to natural hazard risks, risks are omnipresent in Turkey. Interestingly, however, risk perception research is still in its infancy in Turkish social sciences. In an effort to inspire Turkish social scientists to conduct more research, this paper has introduced the concept of risk perception and discussed the main findings of psychological studies. I have also sketched out the implications of these findings for public policy and risk communication.

Taking risk perception seriously opens new avenues of policy-relevant research for social scientists. While a full description of this research agenda is beyond the scope of this paper, the following constitute critical directions for future research.

First, scholars can examine how the use of different “frames” in risk communication influences citizens’ risk judgments and policy preferences. A substantial body of work has established that framing by policy makers or the news media affects how individuals think about a situation.⁴² As Entman writes that “[t]o frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described.”⁴³ In other words, framing refers to the process of defining a message in a particular way for an audience. How risks are framed affects how individuals perceive them.⁴⁴ Scholars can examine the role framing effects play in citizens’ understandings of political, economic, social, medical as well as natural risks.

Similarly, it is important to investigate what kind of infor-

⁴² Amos Tversky and Daniel Kahneman, “The Framing of Decisions and the Psychology of Choice”, *Science* 211 (4481), 1981, p. 453-458; Thomas E. Nelson, Zoe M. Oxley, and Rosalee A. Clawson, “Toward a Psychology of Framing Effects”, *Political Behavior* 19 (3), 1997, p. 221-246; James N. Druckman, “Political Preference Formation: Competition, Deliberation, and the (Ir)Relevance of Framing Effects”, *American Political Science Review* 98 (4), 2004, p. 671-686.

⁴³ Robert M. Entman, “Framing: Towards Clarification of a Fractured Paradigm”, *Journal of Communication* 43 (4), p. 53, emphasis original.

⁴⁴ Slovic/Peters/Finucane/MacGregor, “Affect, Risk, and Decision Making”.

mation facilitates improved risk judgments. Existing evidence suggests that talking about risks merely in terms of probabilities is ineffective due to the problem of probability neglect explained above. Messages that combine probabilities with emotions, however, can attenuate probability neglect, leading to more enlightened assessments.

Another promising direction of research is to explore whether positive or negative affect improves risk judgments. For example, should government officials scare people with images of car accidents and fatalities to encourage seat belt use or reassure citizens with images of healthy people and families who survived a car accident thanks to seat belts? Many questions on the relationship between risk perception and emotions remain to be answered.

Other productive avenues of research include analyzing why individuals and groups with different socioeconomic characteristics and political ideologies react differently to the same risk, whether there are cross-cultural differences between Turkey and other societies, and how Turkish citizens understand various emergent risks such as genetic manipulation and cloning, cyber-attacks, and growing natural resource depletion.

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