Social Theories of Risk and Uncertainty
Social Theories of Risk and Uncertainty: An Introduction

Edited by
Jens O. Zinn
Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>viii</td>
</tr>
<tr>
<td>List of Contributors</td>
<td>ix</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>xi</td>
</tr>
<tr>
<td>1 Introduction: The Contribution of Sociology to the</td>
<td></td>
</tr>
<tr>
<td>Discourse on Risk and Uncertainty</td>
<td>1</td>
</tr>
<tr>
<td>Jens O. Zinn</td>
<td></td>
</tr>
<tr>
<td>Why Theorize Risk and Uncertainty?</td>
<td>2</td>
</tr>
<tr>
<td>The Conceptualization of Risk</td>
<td>3</td>
</tr>
<tr>
<td>The Historical Development of the Notion of “Risk”</td>
<td>7</td>
</tr>
<tr>
<td>The Sociological Contribution to Interdisciplinary Risk</td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>10</td>
</tr>
<tr>
<td>Sociological Streams of Theorizing Risk and Uncertainty</td>
<td>15</td>
</tr>
<tr>
<td>2 Risk Society and Reflexive Modernization</td>
<td>18</td>
</tr>
<tr>
<td>Jens O. Zinn</td>
<td></td>
</tr>
<tr>
<td>From Risk Society and Individualization to Reflexive Modernization</td>
<td>20</td>
</tr>
<tr>
<td>The Power of New Risks: the Enforced Risk Society</td>
<td>23</td>
</tr>
<tr>
<td>The Self-Transformation of the Social: Institutional Individualism</td>
<td>30</td>
</tr>
<tr>
<td>The Political within Risk Society and Reflexive Modernization</td>
<td>37</td>
</tr>
<tr>
<td>Risks and Uncertainties in Reflexive Modernity</td>
<td>43</td>
</tr>
<tr>
<td>Critique</td>
<td>46</td>
</tr>
</tbody>
</table>
Contents

Perspectives .................................................. 48
Further Reading ............................................. 49

3 Governmentality and Risk ............................... 52
Pat O'Malley
Risk in the Development of Governmentality .......... 57
From Risk to “the Risk Society”? ....................... 64
Risk and Liberal Governmentality ...................... 69
Risk and Uncertainty .............................. 72
Conclusions .............................................. 73
Further Reading ............................................ 75

4 Systems Theory and Risk ............................. 76
Klaus P. Japp and Isabel Kusche
Modernity, Decision Making, and Risk ............... 80
The Time Dimension: Modernity ....................... 83
The Material Dimension: Risk and Danger ........... 87
The Social Dimension: Conflicts ....................... 90
Beyond Classical Topics of Risk Research .......... 95
Conclusion ................................................. 100
Further Reading ........................................... 102

5 Edgework, Risk, and Uncertainty ................... 106
Stephen Lyng
Voluntary Risk Taking in Late Modernity ............ 107
Development of the Edgework Concept ................. 110
Theorizing Edgework ................................... 113
The Structural Context of Voluntary Risk Taking ... 122
Conclusions .............................................. 133
Further Reading ......................................... 135

6 Culture and Risk ......................................... 138
John Tulloch
Mary Douglas and Cultural Boundaries ............... 141
Ulrich Beck and Risk Society ......................... 146
Risk and Governmentality ............................ 152
Critical Realism and Left Criminology ............... 156
The Writer as Risk Victim and Academic ............ 160
7 A Comparison of Sociological Theorizing on Risk and Uncertainty

Jens O. Zinn

Theoretical Contexts of Risk Theorizing ................................ 168
Epistemology of Risk ...................................................... 172
The Theoretical Positioning of Risk .................................... 180
Promises, Pitfalls, and Perspectives of Risk Theorizing ......... 200

Glossary ................................................................. 211
References ............................................................... 223
Index ................................................................. 243
Tables

1.1 Risk Epistemology in Different Disciplines and Approaches ..................................8
2.1 Risks and Hazards in Pre-industrial, Classical, and Industrial Risk Society ...................24
2.2 The Ahistorical Model of Individualization ........................................32
2.3 General Criteria for Reflexive Modernization ............................................44
7.1 Understanding of Risk and its Embeddedness in Theorizing ................................178
7.2 Comparison of Risk Approaches on Five Dimensions .............................198
Contributors

Klaus P. Japp is Professor of Political Communication and Risk at Bielefeld University, Germany. He has been a visiting scholar at Harvard University and the University of California in Berkeley. Apart from the sociology of risk his main research interests are political communication research and sociological systems theory. His publications include: Distinguishing non-knowledge, in: Canadian Journal of Sociology (2000) 25(2), 225–38; Risk (Bielefeld transcript 2000); Zur Soziologie des fundamentalistischen Terrorismus, Soziale Systeme. Zeitschrift für soziologische Theorie (2003) 9(2), 54–87.

Isabel Kusche studied sociology in Dresden and New York. She is currently completing a PhD at Bielefeld University, Germany. Her thesis deals with the relationship between policy advice and political consulting from a systems-theoretical point of view. Her research interests include political communication research and the sociology of risk. She has published with Klaus P. Japp, Die Kommunikation des politischen Systems: Zur Differenz von Herstellung und Darstellung im politischen System, Zeitschrift für Soziologie (2004) 33(6), 511–531.

Stephen Lyng is a Professor of Sociology at Carthage College. His major areas of interest are the sociology of risk, sociology of the body, and sociological theory. He is the author of three books: Holistic Health and Biomedical Medicine: a countersystem analysis (SUNY 1990); Sociology and the Real World (with David Franks, Rowman and Littlefield 2002) and Edgework: the sociology of voluntary risk-taking (Routledge 2005).
Contributors

Pat O’Malley is University Professorial Research Fellow at the University of Sydney. Recent publications include Risk, Uncertainty and Government (Glasshouse 2004) and Governing Risks (Ashgate 2006) and with Kelly Hannah-Moffatt, Gendered Risks (Routledge-Cavendish 2007). His current research focuses on the early development of risk in practices in fire prevention, the operation of urban security networks, and the use of money sanctions as means of regulating flows of action in “control societies.”

John Tulloch is Research Professor in Sociology and Communication, and Director, Centre for Media, Globalisation and Risk, School of Social Sciences, Brunel University. His main recent books are Trevor Griffiths (Manchester University Press 2006); One Day in July: experiencing 7/7 (Little, Brown 2005); Shakespeare and Chekhov in Production and Reception: theatrical events and their audiences (University of Iowa 2003); with Lupton, D., Risk and Everyday Life (Sage 2003); Watching Television Audiences: cultural theories and methods (Arnold 2000); Performing Culture: stories of expertise and the everyday (Sage 1999); with Lupton, D., Television, Risk and AIDS: new cultural approaches to health communication (Allen & Unwin 1997).

Acknowledgments

This book grew out of my work within the Social Contexts and Responses to Risk network (SCARR) funded by the Economic and Social Research Council (ESRC) under grant 336 25 0001. I am most grateful for the support of the SCARR network and its Director Peter Taylor-Gooby as well as the support of the School of Social Policy, Sociology and Social Research (SSPSSR). In particular, I would like to thank Chris Pickvance and Jenny Billings as well as my other colleagues and my family for their constructive and valuable comments and thoughts.

Jens O. Zinn
1 Introduction: The Contribution of Sociology to the Discourse on Risk and Uncertainty

Jens O. Zinn

Risk looms large in present-day society. This is most apparent in technical catastrophes (e.g. Chernobyl), environmental changes (e.g. climate change), international terrorism and epidemics (BSE, bird flu), but it is in everyday life as well. We are concerned about whether and whom to marry, what to study, which occupation to learn, how to be financially secure in retirement, and even what to eat or drink. Our desire to minimize risk is evidenced as well by the spread of auditing and risk evaluation techniques in public and private companies (Power 1997, 2004). To help us to avoid risk, we can seek help from the vast amount of advisory literature, take part in training, or engage with supportive organizations.

The implication is that we must be kept safe. “Better safe than sorry” is a well-known proverb of recent times. But is it possible or really desirable to live without risk? Wouldn’t life “be pretty dull without risk”? (Lupton & Tulloch 2002) What is the price we have to pay for taking risks and for reducing risk in our striving for safety, security, and certainty?

Regularly, risks are contested. Is world terrorism a risk which we have to fight by a “war on terror”? How much is global warming an effect of our production of CO₂ and what should we do about it? Is nuclear power a risky business not worth taking or is it a necessary risk which secures our growing need for energy? Do we keep children misinformed about contraception in a misguided attempt to prevent them becoming promiscuous? What probability of becoming handicapped justifies the abortion of an unborn? Does the “precautionary principle” delay crucial scientific advancement and thereby produce new economic risks rather than securing our ecological future?
And how do we respond to risks? Is it reasonable no longer to go by airplane and instead choose to go by car after the terrorist suicide attacks on September 11, 2001? As Gigerenzer (2006) showed recently, the American change from air travel to highway travel after 9/11 caused a jump in fatal highway crashes which significantly exceeded the deaths of 9/11. Is it therefore a reasonable response to the London tube bombings to make a similar switch?

A discourse into social risk behavior is as much a discourse on defining a problem, about different values and lifestyles, power relations, and emotions as it is about “real” risks and their rational management. However, to interpret issues in terms of risk seems itself to be a particular way of viewing our world in terms of politics, science, or everyday life. Therefore we have to examine not just how risk is understood and discussed in society, but how we observe risk as social scientists.

Why Theorize Risk and Uncertainty?

Everyday theories as well as scientific theories are instruments to make sense of our world. They give orientation and enable us to act. This is true not just for laypeople or social scientists, but for organized actors and society at large. Theories structure the notion of whether issues are relevant or not, and what we notice and ignore. Initial assumptions and decisions influence the subsequent theorizing and lead to different research programs as well as different interpretations of the results. Indeed, it makes quite a difference whether we interpret risk phenomena as a result of new and recent types of risk we have to face, as a change in style of governance, as caused by an increasingly differentiated society, as a response to alienating conditions of living, or as a problem of diverse cultural interpretations. This book addresses the implications of such different perspectives in theorizing on risk and uncertainty. It examines advantages and disadvantages of mainstream approaches to risk and uncertainty, which have been developed in several contexts and applied to understanding specific phenomena.

Since risk theorizing is deeply embedded in specific sociocultural backgrounds, the approaches are acknowledged in different ways. In Anglophone countries the risk society and governmentality approaches are widely disseminated, while in Germany risk society competes with systems theory while governmentality has only recently attracted more attention. Cultural theory was originally developed in the USA and has
spread to northern European countries; some newer developments are evident in Australia. Few independent theoretical approaches have been developed in other continental European countries.

Risk discourse and theorizing is linked to historical constellations. It is inevitably confounded by “Zeitgeist” (spirit of the age). On the one hand, one might interpret the Risk and Culture approach by Douglas and Wildavsky (1982) in the context of a science-friendly US society where the resistance of social movements caused irritation, perceived by some as unreasonable and irrational anxieties. On the other hand, Beck’s work on the risk society seems more influenced by the development of a broad societal movement against nuclear power and for an ecological lifestyle in Germany (in the late 1970s), which led to the birth of the Green Party. Thus, it was viewed much more positively as new “bottom-up” politicalization. In Britain the governmentality approach became famous in the aftermath of conservative Thatcherism and New Labour’s neoliberalism. Consequently, public risk awareness is understood primarily in a framework of power strategies applied in a liberal style to govern societies.

However, in contrast to these interpretations it might sometimes appear more appropriate to explain theoretical decisions by personal preferences of the respective authors. Instead of referring to historical constellations, one might like to explain Douglas’s and Luhmann’s theorizing by their conservative political attitude, which sees public resistance to established political institutions as a negative social trend, while Beck interprets resistance as a necessary and reasonable response in order to prevent dangerous societal developments.

The book aims to introduce sociological theorizing on risk and uncertainty by drawing attention to such a variety of dimensions and by enabling and encouraging the reader to theorize self-reflexively and critically.

The Conceptualization of Risk

The use of the term “risk” in the increasing volume of interdisciplinary literature is so heterogeneous that some authors even argue that there are hardly any connections at all (Garland 2003). However, the main concepts of and approaches to risk are dissected and ordered in this section to give a first orientation.

The most general assumption shared by all approaches on risk is the distinction between reality and possibility. As long as the future is
interpreted as either predetermined or independent of human activities, the term “risk” makes no sense at all (Renn 1992: 56). The concept of risk is tied to the possibility that the future can be altered – or at least perceived as such – by human activities. It might be that we can directly control the occurrence of an event or that we can at least make provisions for the aftermaths of an event.

As Luhmann argued, risks have to do with expectations, which can be more or less (un-)certain (1995: 307f.). We cannot even leave our bed in the morning without any expectations of the world. Expectations refer to knowledge and experiences of the past, and they can be developed in a formalized, more or less conscious way, referring to statistical techniques, or in a less formalized manner, referring to everyday knowledge and personal experiences. But what one considers as risky depends not just on knowledge but on sociocultural and individual values as well.

Having said that, it might sometimes be confusing that the term “risk” in interdisciplinary risk discourse is used in at least three different, albeit connected ways. Often, risk is understood as similar to hazard, loss, damage, or threat. Then it is just an indication of unwanted events. At the same time, the term is used for risk calculation. In a technical perspective, risk is then about the probability and extent of an (undesired) event (figure 1.1). However, in a less formalized perspective of everyday life, risk is often calculated by intuitive or pre-rational techniques. Finally, risk is not restricted to negative aspects. The notion of risk taking refers to a positive and a negative side as a weighing up between gains and losses. Research on voluntary risk taking has shown that seeking risks can become a value itself (Lyng 1990, 2005b, 2005c), thus questioning the underlying normative assumption of mainstream risk research that risks have to be avoided and reduced (Renn 1992: 58).

The risk concepts used in a variety of different disciplines and approaches are usually explained against the background of their “epistemological foundation” (compare Renn 1992: 68; Lupton 1999a: 35; Strydom 2002: 47; Taylor-Gooby & Zinn 2006: 407). This refers to whether risk is primarily conceptualized as an entity, which has an objective existence and is objectively accessible beyond the social, or whether risks are primarily seen as being socially mediated or even socially constructed independent of its objective existence (compare table 1.1 for an overview).

In a first realist perspective, risks are primarily understood as real events or dangers which can be approached objectively without being
confounded by subjective and social factors. Such a realist position dominates in a range of domains: for example, in actuarial applications, toxicological and epidemiological research, engineering, and probabilistic risk assessment as well as economic approaches including risk–benefit comparisons (Renn 1992: 56–7). When limits of calculability occur, they are rather interpreted as a lack of knowledge which we can overcome in principle by further research and better scientific analysis. The superior way to manage respective uncertainties is seen in the production of more objective knowledge, even where it is accepted that knowledge will always be limited. In such a realist perspective, risks are calculated by the probability of its occurrence and the amount of damage (compare figure 1.1). Such calculations are reliable as long as they are based on a high number of different events and the future conditions are comparable with the past (“ceteris paribus”). However, models and scenarios are developed in order to find orientation on how to act rationally regarding an uncertain future even when the knowledge is limited. But such models depend on more untested assumptions.

In a second realist perspective, people’s management of risks is interpreted as subjectively biased. This means that although we can objectively find out what the best response to a risk would be, the observable subjective judgments and perceptions deviate systematically. These deviations are interpreted as unreasonable while the ideal is seen as the superior rational option to strive for.

For example, in economics, risk is conceptualized not as physical harm or other objective effect but as an expected utility (Renn 1992: 61). Expected utilities which are regularly expressed in terms of money have the advantage that it is possible to compare directly several risks and costs. The underlying assumption is that individuals try to maximize their utility and that the necessary information and time is available for balancing pros and cons. This conventional approach in economics is relaxed by the acknowledgment of subjective preferences. Subjective utilities acknowledge that individuals’ preferences interpret utility subjectively, referring to different relatively stable values or interests, while the concept of rationality is maintained. When it comes to research on
individuals’ decision making, economics and psychology come close in assuming that there are objectively best decisions while systematic deviations are seen as undesired (Tversky & Kahneman 1987).

The psychometric approach (Slovic 2000) has intensively examined which risks people worry about and how much they are concerned. Using standardized questionnaires, psychophysical scaling, and multivariate analysis, this approach constructs “cognitive maps” of risk perception to discover general patterns and causalities. Risk perception research has shown how the quality of risks (e.g. its scale, dreadfulness, or likelihood) influences responses to risks (Renn 1992: 65; Zinn & Taylor-Gooby 2006a: 29ff.). Further studies attempt to integrate cultural and emotional factors (Slovic 1999) while the sociocultural and historical dynamics of risk communication are less examined. The understanding of the dynamics of interactive processes on risk remains underdeveloped as long as risks are understood as being significantly identified by their objective characteristics, and their perception as determined by general context-independent laws, even though a greater acknowledgment of sociocultural construction of risk has taken place recently (Taylor-Gooby & Zinn 2006).

When it comes to sociological approaches, the perspective changes from objective risks and subjective biases to socioculturally mediated or constructed risks. We see later on (compare Tulloch and Zinn in this book) that in sociological theorizing the link between the sociocultural mediation and construction of risk and its “objective” existence is more complex and diverse than a one-dimensional scale with different degrees of realist or constructivist status could express.

In some approaches, objective risks are interpreted as mediated by social factors. For example, Douglas assumes that even though risks are necessarily real, for focus of debate, they are socially selected and transformed. The selection and perception of risk and the response to risks of a social group would be determined by the group’s institutional organization. The reality of a danger is a prerequisite for persistent debates and activities on risk while their politicalization is culturally determined.

Other approaches explicitly understand risk as primarily socially constructed, as opposed to being mediated. This implies that risk debates might occur and take off without any substantial relation to a “real” world. Even though these theories do not deny the existence of a material world, they conceptualize risk as brought into being and managed
as part of social processes. Therefore, increasing public concerns can only be explained by social factors. For example, the governmentality perspective focuses on the social processes which constitute risk. Risk is understood as a specific way to manage uncertainty by calculative techniques (mainly statistical-probabilistic analysis) which are provided with meaning within institutional and discursive processes. On a similar epistemological level, the systems theory approach interprets risk as constituted by decision making and the ascription of decisions to social actors. Risks are therefore part of every decision! Nevertheless a harm or risk can be attributed to us even though we might have nothing to do with it. Too often social minorities such as foreigners are made responsible for growing unemployment rates. These approaches do not deny a real world in principle but such a world influences how we make sense of risk and uncertainty as social beings. They assume that we can only understand the conflictual struggles about risk by referring to social dynamics. Reality claims about the objective character of such risks are seen as a part of these processes.

Some approaches are difficult to position. They interpret risks as real and socially constructed at the same time. Beck (1999) claims to combine both a realist and a constructivist perspective. He emphasizes on the one hand the reality of risk (as danger, harm, etc.) and its social mediation, and on the other hand the social construction of risks by social institutions. Beck would therefore follow a critical realist perspective, as Tulloch argues in chapter 6 of this book. In his approach on edgework, Lyng (1990, 2005b) interprets the deadly risks of high risk taking as well as the experience of the accompanying “adrenaline rush” as quite real. At the same time he derives the seductive character of high risk taking from social contexts such as an over-socializing and alienating social world. Therefore the experience of risks is understood on the one hand as immediate and pre-social and on the other hand as socially mediated.

The Historical Development of the Notion of “Risk”

The term “risk” first occurs sporadically and in a great variety of contexts. The *Oxford English Dictionary* (Murray 1933; Simpson & Weiner 1989) like many others traces risk back to French (*risque*) and Italian (*risco*) but there seems to be no clear etymological origin of the term.
<table>
<thead>
<tr>
<th>Risk as ...</th>
<th>Perspective</th>
<th>Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>real and objective</td>
<td>Objective calculation of events</td>
<td>Technical risk assessment, insurance, epidemiology, toxicology</td>
</tr>
<tr>
<td>subjectively biased</td>
<td>Objective risks are subjectively perceived and calculated</td>
<td>Psychometric paradigm, rational choice: objective/subjective utility</td>
</tr>
<tr>
<td>socially mediated</td>
<td>The subjective experience of real risks is socially mediated</td>
<td>Edgework</td>
</tr>
<tr>
<td>real and socially constructed</td>
<td>Reality and talk about risks mutually influence and produce each other</td>
<td>Risk society</td>
</tr>
<tr>
<td>socially transformed</td>
<td>Real threats are transformed into risks for sociocultural boundaries</td>
<td>Cultural theory</td>
</tr>
<tr>
<td>socially constructed</td>
<td>Events are risks insofar as they are part of a calculative technology</td>
<td>Governmentality</td>
</tr>
<tr>
<td></td>
<td>Risks are socially ascribed decisions</td>
<td>Systems theory</td>
</tr>
</tbody>
</table>
At the end of the seventeenth century, “risk” was used in many societal domains, and Grimm and Grimm (1854) stated that the German Risiko became part of the everyday language in the eighteenth century. Luhmann (1993: 8ff.) argues that the appearance and dissemination of the term “risk” has to do with a new kind of experience which gains ground in the transitional period between the late Middle Ages and the early modern era and would indicate an historical new experience which takes place in several social domains. “Since the existing language has words for danger, venture, chance, luck, courage, fear, adventure (aventuyre) etc. at its disposal, we may assume that a new term comes into use to indicate a problem situation that cannot be expressed precisely enough with the vocabulary available” (1993: 10). He supposes that the occurrence of the early notion of risk was supported by the insight “that certain advantages are to be gained only if something is at stake. It is not a matter of the cost, which can be calculated beforehand and traded off against the advantages. It is rather a matter of a decision that, as can be foreseen, will be subsequently regretted if a loss that one had hoped to avert occurs” (1993: 11).

An early institutionalized form to enable risk taking and protecting oneself against possible losses was developed in the late Middle Ages in maritime trading. Traders stuck together in order to manage the always acute risk of losing one or more of their ships. They developed an early form of insurance (Luhmann 1993: 9f.). The success of the risk concept went on with the application of techniques of probabilistic risk calculation in a range of societal domains. The idea of insurance against accidents in industrial production and the development of compulsory social insurance were milestones in the societal usage of risk calculation and the management of populations. Ewald (1986) even interprets the development of an insurance society as an index of the transition into modernity. Presently, risk techniques are applied all over society. There are insurances against a huge variety of risks (e.g. life-, car-, social-, and third-party insurances) while industry routinely uses assessment tools to minimize the costs caused by unnecessary accidents. In medicine, similar calculative techniques are applied to find out about new treatments and drugs. Crime control uses risk techniques to calculate the risk of subsequent offences and psychology refers to them in order to evaluate single cases. We use knowledge about risks in everyday decision making: for example, how to behave during pregnancy. In some leisure-time activities, we explicitly seek the risk while simultaneously relying on the safety of the bungee jumping line or the unfolding of our parachute.
The idea of risk taking and the increasing application of risk techniques are expressions of a general change in the understanding of an increasingly disenchanted world, as formulated by Max Weber in “Science as a vocation”:

The increasing intellectualization and rationalization … means … the knowledge or belief that if one but wished one could learn it at any time. Hence, it means that principally there are no mysterious incalculable forces that come into play, but rather that one can, in principle, master all things by calculation. This means that the world is disenchanted. One need no longer have recourse to magical means in order to master or implore the spirits, as did the savage, for whom such mysterious powers existed. Technical means and calculations perform the service. (Weber 1948: 139)

Even though this idea of a rationalized world was never fully realized, it became a central societal semantic and as part of it the concept of risk as well. Risk implies that an uncertain future can be made available to human action foremost with the help of positivist science and technique. Many researchers believe that this position of confidence has been supplanted by an emphasis on the negative side of risk, the damages, losses, and injuries (Douglas 1992; Lupton 1999a; Tulloch & Lupton 2003), and would even cause unreasonable risk aversion or a culture of fear (Furedi 1997, 2002).

But the quality of the change, its assessment and the possible causes are still contentious. While some interpret the increase in risk communication as a rather undesirable development, others emphasize that it is a reasonable response to dangerous societal changes. Some judge life to be safer than ever, while others stress the special quality of new risks which would threaten the existence of all human life. The reasons for the increase in risk communication could therefore be interpreted either as a new sensitivity regarding risks, as an artifact caused by media coverage or as a fundamental change in the quality of the dangers we have to face.

The Sociological Contribution to Interdisciplinary Risk Research

Technological progress in the 1970s and 1980s had a strong impact on the establishment and expansion of interdisciplinary risk research and
the social science contribution to it, even though technical and environmental risks are only one domain of risk theorizing in sociology.

When in the 1970s and early 1980s public resistance to new technologies gained ground, risk techniques were already developed and successfully applied in many societal domains. Large-scale incidents such as the near disaster of Three Mile Island close to Harrisburg (1979) and later the technical accident in Bhopal (1984) and the nuclear power catastrophe in Chernobyl (1986) seem to indicate the systematic safety limits of such large-scale technologies and our ability to control them. These concerns are reflected in Perrow’s study on “Normal Accidents” (1984). He concluded after examining a huge range of techniques and accidents that in complex technologies, such as nuclear power, accidents are unpreventable, and because of their catastrophic character it would be irresponsible to introduce such technologies.

The growing public resistance to technological innovations became a great concern of politicians and technicians. It eroded the unquestioned consensus of the priority of technical and economic progress. As a result, political decisions became even more uncertain. Because of the urgent need to secure the basis for decision making, research increasingly concentrated on the question of which new technologies would be acceptable to the public. First a technician, Chauncey Starr (1969), attempted to predict the public acceptability of new technologies by comparing the public acceptance of already established technologies to produce energy with the new nuclear power technology and their respective costs (calculated in deaths per produced energy). He concluded that the relation between cost and benefit was significantly better than with other already accepted technologies, and was therefore acceptable. But his prediction failed because public risk aversion was not yet properly understood.

Cognitive psychologists, who by then were examining people’s decision making in laboratory experiments, developed a different approach. They no longer derived public acceptance (revealed preferences) by comparing the effectiveness of old and new technologies. Instead they started to ask people directly about their concerns and worries regarding new technologies (exposed preferences). This kind of risk perception research, conducted with the help of standardized questionnaires and large-scale surveys, has become the most influential approach in interdisciplinary risk research, the psychometric paradigm (Slovic 2000). It originally followed a widely disseminated deficit-model of public risk
perception, which explained faulty perception by the cognitive limitations of human beings (Slovic et al. 1977a).

Important insights resulted from this research, even though the certain knowledge necessary for far-reaching decision making was not obtained. Risk perception research shows that the perceived seriousness of risks (expected numbers of fatalities) and the catastrophic potential influence the acceptance of a risk even when its probability of occurrence is very low. Risks with a low probability but high consequences are perceived as more threatening than more probable risks with low or medium consequences. Additionally, having personal control over a risk or familiarity with a risk decreases the perceived risk (compare Rohrmann & Renn 2000; Slovic 2000; Zinn & Taylor-Gooby 2006a: 29–31).

Taylor-Gooby and Zinn have summarized more recent developments in psychological and psychometric research as showing more awareness of the impact of culture on risk perception, and even biographical experiences are occasionally acknowledged (compare Taylor-Gooby & Zinn 2006; Zinn & Taylor-Gooby 2006b). There is still a lack of knowledge, however, regarding the conceptualization of the dynamic processes of risk perception and responses which would allow reliable prognoses of people’s responses to new (technological) risks. Moreover, the ambitious approach to bring together a range of empirical insights into the Social Amplification of Risk Framework (SARF; Pidgeon et al. 2003) has proved unable to produce further additional knowledge regarding the dynamic processes of risk perception and responses (Zinn & Taylor-Gooby 2006a: 32–4).

The rapid development of sociological research on risk in the 1980s was mainly supported by public resistance and controversies regarding new technological risks, and the limits of technical and psychological analyses in explaining the dynamics of risk discourse and responses. Instead, the significance of social and sociocultural factors became more acknowledged in explaining resistance to and controversies about risk.

Most important for the sociological contribution to the discourse on risk was the expert/lay-people controversy. Early risk research assumed the superiority of objective science-based knowledge, while the lay-person’s understanding of technologies and risks was seen as inferior and biased as a result of a lack of objective information and a contamination with irrational beliefs and emotions. It was therefore assumed that the best solutions to risk problems could be reached by enlightening and
educating the public with the right knowledge. However, this educational approach in risk communication failed for several reasons.

Research within the sociology of scientific knowledge showed that professional expertise often lacks local and practical knowledge (Wynne 1982a, 1982b, 1987, 1992, 1996). Gained in the controlled and stable contexts of the laboratory, scientific results and insights regularly fail because they cannot be transferred directly to real-life conditions. Wynne (1992) argues, for example, that experts’ ideas about safety regarding the application of pesticides were often rather naïve; neither does herbicide always arrive at the point of use with full instructions intact and intelligible; and nor do the farmers and other users apply the pesticides with full protective gear and in correct solvents, with proper spray nozzles and other equipment, and the weather conditions are often less ideal than assumed. Furthermore, Wynne shows that lay-people do not in principle act irrationally but follow another social and/or subjective rationality which includes their own experiences and experience of scientific and professional expertise, and their failures. Lay-people do not uncritically accept scientific knowledge as true, but read the “various elements of institutional ‘body-language’” (Wynne 1996: 65) which give information regarding the reliability of the alleged objective knowledge. Research has repeatedly shown how misinformation by official institutions rapidly decreases trust in the reliability of such institutions, and how difficult it is to rebuild trust once it is lost (Zinn & Taylor-Gooby 2006b: 61ff.).

A variety of public participation measures (consensus-conferences, public debates, etc.) were applied as a result of such problems with knowledge, legitimacy, and resistance. Even though such strategies are often successful, this is not necessarily the case, since risk conflicts are not only a question of objective knowledge. Instead a range of issues are involved, such as value conflicts, conflicts regarding the acknowledgment of different rationalities, conflicts regarding power and finally emotional aspects (Zinn & Taylor-Gooby 2006b). Sociological theorizing therefore contributes on at least five dimensions to the discourse on risk: values, knowledge, rationality, power, and emotion.

Central is the sociocultural dimension of values. Risk questions are never just a question of the rational application of objective, value-free problems. Even in the highest technical application, values concerning the acceptability of a specific level of risk or uncertainty are involved. The outstanding merit of Douglas’s work on risk and culture was to
introduce the cultural dimension into discourse. She showed that selection and responses to risk are influenced by the sociocultural organization of a social group.

The sociology of scientific knowledge (Wynne 1975, 1982a, 1987, 1996, 2002) and theorizing on the risk society (Beck 1992b) contribute a new understanding of knowledge. The idea of objectified laboratory knowledge directly applicable in practical contexts is complemented or even supplanted in sociological theorizing by notions of social and subjective knowledge. Such forms of localized knowledge and their public negotiation by several competing organized agents are much more in the focus now. Additionally, questions address the cognitive reflexivity of knowledge and how other forms of intuitive or pre-rational knowledge are involved in the perception and management of risk.

That goes along with the question of rationality and whether, in a highly differentiated and complex modern society, reasonable decision making can rely on an overall integrating rationality. This is about competing social and subjective rationalities which are concerned with questions of values and social differentiation rather than with instrumental rationality. Instead of finding consensus, it is often more reasonable to seek and accept “second best” solutions (Japp 2000a; Zinn 2004: 17).

Sociological research shows that the objectivist discourse on risk covers societal power relations. The conflicts regarding the right knowledge, rationality, and values are embedded in power games and the governance of modern societies, constituted by a wide range of (organized) actors. Patterns of power develop historically and are therefore hardly predictable (O’Malley in chapter 3 of this book; Rose 1999; Dean 1999a).

Finally, defining and negotiating risk has a lot more to do with emotions, as generally acknowledged in the interdisciplinary discourse. This is not concerned solely with worries, concerns, and fears, but also with the physical experience of risks. It might be embodied in excitement, as in edgework (Lyng 2005a), or in social suffering (Bourdieu et al. 1999). Moreover, emotions are often used as a kind of advisor, referring to complex experiences which cannot be transformed into formalized objective knowledge.

The various streams of theorizing refer to these dimensions differently. While in the next five chapters respective authors present the different ways of theorizing, in the last chapter I will compare them systematically in terms of their underlying ideas and epistemological differences,
Introduction

and how they refer to central dimensions such as values, knowledge, rationality, power, and emotions.

Sociological Streams of Theorizing Risk and Uncertainty

Five central sociological streams of risk theorizing are presented.

The risk society approach was introduced by Ulrich Beck (1986) in Germany and internationally with its translation into English in 1992. Several publications followed (e.g. Beck 1999). This approach interacts fruitfully with the British discourse (Beck et al. 1994) and the work of Anthony Giddens (1990, 1991, 1999). More recent work emphasizes the concept of reflexive modernization (Beck et al. 2003). Chapter 2 outlines the development of the approach from early work on the risk society to the more recent contributions on reflexive modernization developed in the context of the collaborative research center known as Reflexive Modernization in Munich.

The governmentality perspective on risk draws on Michel Foucault’s work on governmentality (1991a), which was further developed by the historical work of a circle of researchers close to Foucault in France: Françoise Ewald ([orig. 1986], 1991), Daniel Defert (1991), Jacques Donzelot (1980, 1988), Giovanna Procacci (1978, 1998), and Pasquale Pasquino (1978, 1980). First and foremost, the approach spread out to Britain (e.g. Rose 1996a, 1996b, 1999) and Australia (e.g. Dean 1999a) to form a governmentality approach with a strong contribution to risk. Pat O’Malley, who contributed substantially to this debate (e.g. 2004), describes the development of the approach in chapter 3. He outlines the Foucauldian approach on power as governmentality and shows how risk is part of a specific kind of liberal governance. Finally, he suggests a broader theoretical approach to the management of uncertainty beyond risk.

The systems theory on risk, in the tradition of Niklas Luhmann (1993 [orig. 1991], 1989 [orig. 1986]), is mainly acknowledged in Germany. One of the central proponents of this approach is Klaus P. Japp (1996, 2000a). In chapter 4, he and Isabel Kusche outline the systems theory thinking on risk. They introduce its central concepts (functional systems, communication, code, second-order observation) and show how risk is positioned in the core of systems theory as “the modern form for observing decisions.” They discuss risk in relation to the three dimensions