The role of emotions in judging the moral acceptability of risks

Sabine Roeser *

Philosophy Department, Faculty of Technology, Policy and Management, Delft University of Technology, Jaffalaan 5, 2628 BX Delft, The Netherlands

Received 6 April 2005; received in revised form 10 January 2006; accepted 5 February 2006

Abstract

This paper argues that we need emotions in order to make a rational decision as to the moral acceptability of technological risks.

Empirical research has shown that people rely on emotions in making judgments concerning risks. However, this does not as yet answer the following normative question and the main question of this paper: do we need emotions in order to be able to judge whether a risk is morally acceptable? This question has direct practical implications: should engineers, scientists and policy makers involved in developing risk regulation take the emotions of the public seriously or not?

In answer to these questions, rationalists would argue that the emotions of the public should be ignored because they are irrational. On the other hand, subjectivists would argue that even though emotions are irrational, they should be a part of the decision making process because they show us our preferences. In contrast to both of these approaches, this paper defends a cognitive theory of emotions according to which emotions are necessary to make a rational practical decision. Emotions are an indispensable normative guide in judging the moral acceptability of technological risks.

Keywords: Risk; Ethics; Emotions; Rationality; Technology

* Tel.: +31 15 2788779; fax: +31 15 2786233.
E-mail address: S.Roeser@tudelft.nl

© 2006 Elsevier Ltd. All rights reserved.
1. Introduction

The issue of technological risks¹ directly gives rise to ethical issues. Risky technological projects might affect the well-being of people. When is it justified to impose dangers on others? And how should we judge whether a risk is morally acceptable or not?

Empirical research has shown that people rely on emotions in making judgments concerning risks (Finucane et al., 2000; Slovic, 1999). The role of emotions in judging technological risks is the subject of empirical research, but it is little studied by philosophers. This is a pity, because this issue involves pressing normative questions that cannot be answered by empirical research. This paper aims to fill this gap by providing for a normative, philosophical discussion of the role of emotions in judging the moral acceptability of technological risks.

Examples of technological risks that spark heated and emotional debates are cloning, GM-foods, and nuclear energy. Many people are afraid of the possible unwanted consequences of such technologies. However, this does not as yet answer the following normative question and the main question of this paper: do we need emotions in order to be able to judge whether a risk is morally acceptable? This question has direct practical implications: should engineers, scientists and policy makers involved in developing risk regulation take the emotions of the public seriously or not?

In answer to these questions, the two dominant approaches in ethics would respond in different ways. Rationalists take emotions to be subjective and irrational; moral judgments should be made by reason. With regards to moral judgments about risk, rationalists would argue that the emotions of the public should be ignored because they are irrational. On the other hand, subjectivists think that ethics is grounded in subjective feelings and preferences of people. In the context of moral judgments about risks they would argue that even though emotions are subjective, they should be a part of the decision making process because they show us our preferences. In contrast to both of these approaches, this paper will defend a cognitive theory of emotions according to which emotions are necessary to make a rational practical decision. This paper will argue that emotions are an indispensable normative guide in judging the moral acceptability of technological risks.

2. What is a technological risk?

Engineers define risk as a function of probabilities and unwanted consequences. Examples of unwanted consequences are the number of deaths or injuries, or the degree of pollution. Policy-makers use cost-benefit analysis to weigh the possible advantages of a technology against its possible disadvantages.

Many social scientists who work in the field of risk analysis argue that cost-benefit analysis and the definition of risk as a function of probabilities and unwanted consequences are not sufficient to determine whether a risk is acceptable or not. They also emphasize the importance of further considerations such as whether a risk is taken voluntarily, the distribution of risks and benefits in a population, and the available alternatives to a technology. Furthermore, a high probability of a small effect might be more acceptable than a small probability of a large effect, even though the product of probability and effect might be

¹ In the following, I will often just use the term ‘risk’, meaning technological risks.
approximately equal. Defenders of such an approach argue that all risk judgments involve evaluative aspects. Even the standard definition of risk involves an evaluative judgment as to what counts as an unwanted consequence (Fischhoff et al., 1981; Jasanoff, 1993; Slovic, 1999).

In the studies of these issues by social scientists, two questions are involved: (1) How does the public perceive risks? and (2) how do people judge the acceptability of risks? This paper will focus on the second question. However, it will not discuss this question from an empirical point of view but from a normative, philosophical point of view.

Social scientists in the field of risk analysis tend to consider judgments concerning acceptable risks as subjective because they involve emotions, value judgments and context-sensitive features (Finucane et al., 2000; Krimsky and Golding, 1992; Slovic, 1999). Many of these authors also claim that risk is a social construction because people have different notions of risks (Slovic, 1992, 1999; many authors in Krimsky and Golding (1992) express such a view). The question is whether these interpretations really help to improve the debate on acceptable risks. The danger of taking value judgments as subjective and risk as a social construction that does not really exist is that concerns about risks can be ignored as supposedly being irrelevant or maybe even misguiding (Shrader-Frechette, 1991). This is indeed argued for by Weiner (1993).

This paper will develop an account that allows for the idea that the aforementioned additional aspects of risk are not subjective. This requires a two-fold strategy: to argue that moral judgments concerning risks are not subjective and to argue that moral emotions are not subjective.

3. Risk and moral truth

In numerous studies, Paul Slovic (often in collaboration with colleagues) has studied the perception of risk by laypeople and compared that to risk perception of experts and scientific approaches to risk. These studies indicate that laypeople judge risks in different ways than experts. Scientific approaches to risk focus on annual fatalities as a measurement of risk. Laypeople have a broader conception of risk; they also include additional, evaluative considerations in their assessment of risks. Apparently, scientists and other experts consider risk to be a one-dimensional quantitative notion, whereas laypeople understand risk as a multi-dimensional, qualitative notion. These are some of the evaluative considerations which Slovic and his colleagues have found to be important for laypeople’s risk perceptions: whether a risk is controllable, whether it is taken voluntarily, whether risks and benefits are equitable or not, whether a risk is familiar, and whether it might be catastrophic (Slovic, 2000, p. 140).

Many social scientists claim that since all risk judgments, also those of experts, include values, all risk judgments are subjective and socially construed. But this does not follow. Slovic (1999) seems to equate objectivity with what is ‘out there’ and with what is quantitative, whereas all of the following notions are grouped under the label ‘subjective’: ‘social construction’, ‘values’, ‘assumption-ladenness’, ‘judgment’, ‘intuitions’, ‘subjective assessment’, ‘qualitative’, ‘emotional’, ‘contextual’. Some of these notions are by definition subjective or at least not objective, i.e., subjective assessment and social construction. However, the other notions are not necessarily subjective. For example, assumption-ladenness might indicate that we should be cautious in adopting a certain view since it might be arbitrary or not well-grounded, but the fact that a position is assumption-laden does not as
such make it subjective. Values, judgments, intuitions, qualitative, emotional and contextual are also not necessarily subjective notions. Judgment, intuition and emotion are ‘subjective’ in the sense that they are bound to persons who have them, but this holds for all our cognitive abilities. The question is whether these abilities can help us assess what is really there. This is a philosophically controversial issue; it is far from philosophically obvious whether emotions, judgments and values are subjective projections or rather, if they are forms of objective discernment. According to most contemporary moral philosophers, moral values are not arbitrary or subjective. Moral judgments are truth-apt (moral cognitivism) and they concern objective moral truths (moral realism; cf. for example, Brink, 1989; Dancy, 1993, 2000, 2004; Jackson, 1998; McNaughton, 1988; Sayre-McCord, 1988; Smith, 1994).

The fact that people can disagree about moral issues does not imply that ethics is subjective. Even if there are moral truths with regards to risks, people can still have different ideas about these truths. People also have different scientific insights, and yet we assume that there are scientific truths that we try to understand. Moral realists think that analogously, we can try to understand moral truths.

Moral realism is a theory according to which whether a moral judgment is true depends on the way the world is and not on the way we think the world to be, meaning, just as in general realism, that the objects of our knowledge exist independently of our beliefs about them. The main argument for moral realism appeals to the following intuition: if there were no moral truths, there would not be an objective standard against which to evaluate a situation. If, for example, morality were merely subjective or constituted by conventionality or ‘ways of life’ (Mackie, 1977), it is hard to see how we can say that one way of life can be better than another. Our moral intuitions, however, clearly tell us that certain moral practices are wrong. Consider for example racism or the way that some cultures treat women. Our intuitions are that these practices are really, i.e., objectively, wrong. However, if morality were merely subjective or constituted by practices, it would follow, by definition, that no practice could be morally better or worse than another. But the whole point of morality seems to be exactly the opposite: moral judgments are about what kinds of actions are right or wrong. This might sound like wishful thinking or circular reasoning, but it is rather to be understood as ‘inference to the best explanation’. Our moral intuitions can function as a test for a philosophical hypothesis (cf. Thomas Reid’s common sense philosophy; Reid, 1969a,b).

There are philosophical arguments which state that judgments, intuitions and emotions can help us to assess what is really there, albeit in a fallible way. So-called reliabilists in philosophy argue that we cannot ground all our views in rational arguments, since either this would lead to an infinite regress of always requiring further arguments, or to circular reasoning or to arbitrary assumptions (cf. Alston, 1993). Judgment is an inevitable basis of epistemic justification that we have to rely upon. Ethical intuitionists claim the same for basic ethical beliefs, namely, that we cannot argue for them any further but that they can still be taken to be justified perceptions of moral reality (cf. Reid, 1969b). Cognitive theories of emotions allow for the idea that emotions are basic perceptions of moral reality (e.g., Döring, 2003). Moral realists argue that values, qualitative and contextual features

---

2 This view is even defended by some subjectivists, such as Blackburn (1998) and by constructivists such as Korsgaard (1996a,b).
are part of the world or part of how the world really is in an evaluative sense; they are not arbitrary or socially construed projections.

This also applies to moral judgments about risks. In the words of Kristin Shrader-Frechette:

…it is false to say that hazard assessments can be wholly value free (as many naive positivists claim), and it is equally false to assert (as many cultural relativists do) that any evaluation of risk can be justified. That is, some risk evaluations are more warranted, more objective, than others, although none is wholly value free (Shrader-Frechette, 1991, p. 30).

Moral realism allows for the idea that the additional moral considerations about risk mentioned previously are not subjective. Furthermore, cost-benefit analysis as used by engineers and policy makers is based on utilitarian calculus, which has been the subject of severe criticism by moral philosophers. Cost-benefit analysis inherits the following problems of utilitarianism: for example, it only looks at outcomes of actions, not at the actions themselves (‘the end justifies the means’), and it is ignorant of distributional issues and of the motives from which actions are done.

Many philosophers from the ethical intuitionist school have argued that there is a plurality of morally relevant considerations (Ewing, 1929; Ross, 1968, 2002; for a similar view, cf. Nagel, 1979). It depends on the concrete circumstances which morally relevant consideration is most important. A more extreme form of this approach is ethical particularism which states that moral truths do not depend on the existence of general moral principles (Dancy, 1993, 2004). On these accounts, context-sensitivity is not a form of subjectivity, pace Slovic and other social scientists; rather, the morally relevant circumstances are part of the objective world.

These ideas can directly be applied to the issue of acceptable risk. For example, a fair distribution of risks and benefits is morally good in itself, not just because it happens to be preferred. Autonomy is an important moral value. The fact that people accept higher risks concerning activities they have voluntarily chosen is not so much a sign of irrationality or contingent personal preferences, but reflects the centrality of autonomy to our moral life. An important moral principle is ‘ought implies can’. Translated to the context of risk one could formulate the following moral principle: if possible, try to avoid or minimize potentially harmful activities. However, if there are no available alternatives, one might have no choice but to undertake risky activities. Such an activity can then be morally justified given the specific circumstances, i.e., the fact that there are no reasonable alternatives available. Hence, driving a car might be a risky activity that many people nevertheless might undertake because they do not have sufficient public transport available. However, the same people might nevertheless reject nuclear energy because alternative sources of energy can be exploited, although car driving might have a higher mortality-rate than the use of nuclear energy. Furthermore, a catastrophic event such as a nuclear meltdown might be unacceptable, even though its probability is low.

In these examples, various ethical considerations play an important role. Furthermore, there can be situations which are genuine dilemmas: these are situations in which whatever course of action we choose, we do something wrong. In the case of judgments about acceptable risk, this can easily happen because, as Sunstein (2005) emphasizes, risks are almost always present in the various options for action. Sunstein suggests considering cost-benefit analysis in such situations. However, cost-benefit analysis may oversimplify issues
by disregarding the additional considerations previously mentioned. A dilemmatic risk
decision would be one where we would have to choose between, for example, an option
with an equitable distribution between risks and benefits and an option with a lower net
risk but with a less equal distribution, or where more people are affected involuntarily.
Although cost-benefit analysis might provide us with a clear-cut answer, in such cases it is
far from obvious whether such an approach would provide an answer that we find morally
right. In a genuine dilemma it might be impossible to find a completely irreprehensible
action, but we should at least explicitly consider all morally relevant aspects in order to
make sure that our judgment is as well-grounded as possible.

Cost-benefit analysis oversimplifies the complexity of issues involved in deciding on
what is an acceptable risk. There is no clear-cut method with which to weigh the different
considerations that may play a role in a concrete case in which a decision has to be made
about what is an acceptable risk. We cannot avoid employing moral judgment in order to
make such a decision (cf. Nagel, 1979). However, as argued before, this does not mean that
judgments about acceptable risk are subjective.

The aforementioned additional aspects of risks are morally relevant considerations that
have to be taken seriously in their own right. This will help to reshape the discussion con-
cerning the acceptability of risks: indeed, more is needed than a function of probabilities
and consequences, but that does not make judgments concerning the acceptability of risks
subjective, to the contrary, these considerations are essential to a full assessment of the
moral acceptability of risks.

4. Risk and moral emotions

When people are emotional about a certain risk they tend to disregard probabilities
(Sunstein, 2005). According to Slovic et al. (2002) and Finucane et al. (2000), people use an
‘affect heuristic’, which means that for laypeople, certain risks are affectively loaded, which
influences the way in which they rate risks:

If people use the affect heuristic, then a person who has a positive feeling about, say,
Cellular Phones, will rate it higher on benefit and lower on risk than will another per-
son whose affect is not so positive. This will induce a negative correlation between
risk and benefit ratings for Cellular Phones across participants (Finucane et al., 2000,
p. 7).

Psychologists and decision theorists who emphasize the importance of the role of emo-
tions in judging whether a risk is acceptable take these judgments to be subjective (Finu-
cane et al., 2000; Loewenstein et al., 2001; Slovic, 1999). Instead, in the remainder of this
paper it will be argued that moral judgments concerning risks based on emotions are not
necessarily subjective. Jaeger et al. (2001) discuss the limitations of the view of rationality
underlying mainstream risk analysis. Risk analysis is based on normative decision theory
which does not correspond well with the way people, as a matter of fact, make decisions.
Jaeger et al. argue that we should employ a broader notion of rationality in decision mak-
ing about risk. My argument will be that emotions should be included in such a broader
and more appropriate notion of rationality.

There are two major traditions in moral thought about the role of emotions, which
derive from the works of the German philosopher Immanuel Kant and the Scottish philos-
opher David Hume. Both take emotions to be subjective. The subjectivist Hume (1975)
thinks that ethics is based on emotions, so he concludes that there cannot be objective moral truths. The rationalist Kant (1956) instead believes that ethics is objective, and hence emotions have to be banned from moral thought.

Most moral philosophers think that we have to choose between the two horns of the Hume-Kant dilemma: either take emotions seriously but forfeit claims to objectivity, or reject emotions as being a threat to objectivity. However, based on modern theories of emotions, we can reject this dichotomy as a false dilemma. According to recent developments in neurobiology, psychology and the philosophy of emotions, emotions and cognitions are not mutually exclusive, but rather, in order to have moral knowledge, we need to have emotions (Damasio, 1994; de Sousa, 1987; Haidt, 2001; Little, 1995; Nussbaum, 2001; Roeser, 2002; Solomon, 1993). Nussbaum (2001) argues that emotions are judgments of value.

According to most contemporary theories of emotions, emotions are complex states that have cognitive, affective, motivational and expressive aspects (Scherer, 1984). Emotions have intentional objects: I am afraid of something, I love somebody, I am angry about something, etc. Emotions should be distinguished from pure physiological feeling states that do not have a cognitive element, from moods which are not about specific objects but rather concern a general outlook on life and from dispositional emotions that are character traits (e.g., being a happy, aggressive or caring person; for more on these distinctions, cf. Ben-Ze’ev, 2000).

Slovic et al. (2004) and Finucane et al. (2000) seem to equate all immediate responses with affective responses, with the assumption that long-term, reflective responses are not affective. Sunstein endorses this analysis by referring to dual process theory which distinguishes between two different cognitive systems. System I operations are ‘rapid, associative, and intuitive’, system II operations are ‘slow, complex, and often calculative and statistical’ (Sunstein, 2005, p. 87). However, a cognitive theory of emotions allows that long-term reflective responses can be emotional as well, and that purely rational reflection would miss out on important evaluative aspects.

To be able to have moral knowledge, we have to know or to be able to imagine how it feels to be in a certain situation, to be treated by others in certain ways, to know how it feels when one is hurt or happy. These emotions are fundamental features of human life, they point to what morality is all about. We cannot really understand moral life without knowing these emotions, and without the ability to feel sympathy, empathy and compassion with others. This means that only beings with the appropriate ability to have emotions can make justified moral judgments. The moral point of view means that we care about morally important aspects of the lives of others.

A cognitive theory of emotions can be directly applied to the topic of risks: we need emotions in order to achieve an objective picture of the moral acceptability of technological risks. This idea is supported by empirical research: emotions are a form of appraisal of our environment (Lazarus, 1991). They are necessary in avoiding what is bad for us (Damasio, 2003). Emotions are functional in for example indicating dangers and in setting us to act in an appropriate way (Frijda, 1987). Fear and enthusiasm are important emotions in assessing the moral value of risks and benefits of a technology. Furthermore, sympathy is an important moral emotion with which we can get a better understanding of issues such as equity, e.g., by caring about the position of disadvantaged people.

Let us look again at the additional considerations concerning acceptable risks that I have previously mentioned. These were: (1) whether a risk is taken voluntarily; (2) what the
distribution of risks and benefits is in a population; (3) what the available alternatives to a technology are; and (4) a higher probability of a small effect might be more acceptable than a small probability of a large effect. In the previous section, I have argued that these considerations can be considered as objective moral truths that really make a difference as to whether a risk is acceptable or not. I will now discuss in how far emotions can play a role in assessing these aspects.

4.1. Voluntariness

If people are forced against their will to do something that they consider to be dangerous it might lead to feelings of anger and frustration. However, these reactions are completely intelligible: a *prima facie*3 injustice has been committed, and only if these people can be persuaded that there are good overriding reasons to force them to undergo such risks will their resentment cease. In contrast, if no good explanation can be given to them, they will remain upset, and rightly so, since one of their fundamental rights has been harmed. We would actually find somebody irrational who would not get upset by such an assault on his or her fundamental rights. If somebody would say, ‘I know, they are violating my autonomy by building this chemical factory in my neighborhood without informing me or asking my consent, and without being able to show me the general advantages of it, and I think that it is not fair, but I don’t care’, we would think that this person is irrational. Somebody who makes a moral judgment should have an appropriate emotion. According to some cognitive theories of emotions we cannot have moral knowledge without having certain feelings or emotions (Damasio, 1994; Nussbaum, 2001). That means that if somebody does not feel outrage by a violation of his autonomy, then this person might not be able to fully grasp the injustice that has been done to him.

4.2. Distribution of risks and benefits

Here we can give an argument similar to the one above. A fair distribution of risks and benefits is morally preferable to an unfair distribution. It is only reasonable that somebody feels outrage if she is to undergo the risks of a certain technology without being able to benefit from it, whereas somebody else may get all the benefits without undergoing the risks. Imagine somebody who lives in a poor neighborhood in which a polluting factory is placed, whereas the director of that factory lives in a wealthy neighborhood at a safe distance of the factory. We would question the rationality of the person in the poor neighborhood if she would not feel outrage at such a situation.

In both cases (violation of autonomy and unfair distribution of costs and benefits), we find it morally reasonable if somebody who is the victim of an injustice feels outrage at that injustice. In addition, we would also expect that other people find such injustices morally reprehensible even though they are not themselves the victims. We would even expect that someone who imposes this injustice on another person should be forced to reassess his action by caring about the position of the other. If this person cannot have such feelings of sympathy, we would call them hard-hearted and egoistic. Hence, emotions do not only help

---

3 The notion of *prima facie*-duties has been introduced by Ross (2002). *Prima facie*-duties are duties that hold unless they are overridden by other, conflicting duties that are more important in a specific situation, cf. my previous discussion of context-sensitivity.
to assess one’s own situation but also that of others, and they can help one to see that one’s own actions can impose an injustice on others.

4.3. Available alternatives

Let us look at the example of driving a car versus nuclear energy again. A person might live in a small village or in a country without a well-organized public transportation system, or she and her partner might have busy jobs while their children also need to be taken to school. In all these cases, a car might be the only acceptable means of transportation, even though people might fear the risks of driving a car. However, concerning nuclear energy, there are various alternative sources of energy that are not as yet fully exploited and that are safer than nuclear energy, such as solar energy, wind energy or energy from water turbines. The main argument of proponents of nuclear energy is that, as long as everything goes well, nuclear energy is safe and clean and that it is cheaper than alternative sources of energy. However, if alternative sources of energy will be exploited at a larger scale, they might become cheaper in the long run. And maybe nuclear energy is clean and safe as long as there is no accident—even though there is still the problem of nuclear waste—and the probability of an accident might be small, still, it is always possible that an accident might happen and then the consequences would be dramatic. Hence, it is not irrational that people prefer alternative sources of energy and that they have a negative emotional attitude, such as fear, towards nuclear energy. It is not enough to show people that the quantitative risks of nuclear energy are lower than those of driving a car. People rather want to hear convincing arguments why nuclear energy should be preferred to alternative sources of energy.

4.4. High or low probability or effect

Let us stay with the same example, driving a car versus nuclear energy. Even if the probability of a car accident might be relatively high, the possible bad effects are rather limited. They range from car damage through slight injury to major injury or even death. Even though a major injury or death of a few people are shocking ideas, this is nothing compared to the horrifying pictures we can imagine if a nuclear meltdown should occur. It does not have to be a major consideration how likely such an event is, the fact that it might occur at all is already terrifying. Not only will it involve far more people than any single car accident, it might also destroy the environment for years to come and carry with it unforeseen health damages that could affect the future of many people. Even 20 years after the Chernobyl-accident, the area around Chernobyl is still not safe. Single car accidents might disrupt individual lives, which is bad enough, but a nuclear meltdown might change parts of our world for good. The magnitude of a hazard can be so severe that probabilities are irrelevant. This justifies why people fear nuclear energy. Furthermore, there is always the possibility that the experts might be wrong about the probabilities (Hansson, 2004), which might be an additional reason for people to ‘rather be safe than sorry’.

All these considerations show the reasons that give rise to the emotions that people have concerning certain risks, and they also show that we need imagination and sympathy to fully grasp the extend to which a risk might affect our lives and those of others. Somebody who is convinced that the risks of nuclear energy are acceptable should give counterarguments instead of dismissing these concerns and emotions as irrational.
5. Emotional reflection about acceptable risks

Let me just mention a further issue which I cannot discuss in any detail. The idea that emotions are necessary in order to obtain moral knowledge concerning risks does not imply that emotions are infallible as a normative guide. Emotions can help us to focus on certain salient aspects, but they can also lead us to overlook other aspects (Slovic et al., 2002, 2004). For example, engineers might be misled by their emotions: their enthusiasm about a product can lead them to overlook certain risks. Policy makers might be tempted to overlook risks because of the desire for economic prosperity for their region that is promised by a certain technology. The public might be ill-informed and hence only focus on risks and overlook certain benefits. They might wrongly estimate the purely quantitative amount of a risk because they perceive it as threatening. All involved parties might be biased, and their emotions might reinforce those biases. Sunstein (2005) calls this ‘probability neglect’ and argues that emotions are especially prone to let laypeople neglect probabilities.

While rationalists would claim that we should correct our emotions by reason, subjectivists would claim that emotions should rule. Instead, a cognitive theory of emotions allows for the idea that emotions themselves have critical potential. Reason and emotion should criticize each other, but emotions should also be used to critically examine other emotions (de Sousa, 2001; Lacewing, 2005), by trying to understand different perspectives through sympathy and empathy. For example, those who benefit from a technology should try to understand the perspective of those who are potential victims of the technology.

6. Practical implications

In this paper I have argued that, in order to judge whether a risk is morally acceptable, more is needed than a function of probabilities and consequences and cost benefit-analysis, and we need emotions to detect other morally relevant considerations. However, both claims do not make moral judgments concerning risks subjective as has been claimed by psychologists and social scientists. Moral realism and a cognitive theory of emotions allow for extra considerations revealed through emotions without making judgments concerning acceptable risks subjective.

These insights can help to reshape the discussion concerning the moral acceptability of risks. Concerning the question whether a risk is morally acceptable or not, we have to distinguish between two questions: firstly, we need to know the probability of unwanted consequences, secondly, we have to determine whether that risk is morally acceptable. The first question has to be answered by scientists, given a certain definition of what counts as unwanted consequences. The task of scientists and engineers is to supply statistical data about risks and communicate them in a responsible way to the public and to policy makers.

However, the second question is a moral question which involves all people and in which emotions have to play a role so that we can form a well-grounded judgment. A function of probabilities and consequences is not sufficient to judge whether a risk is morally acceptable or not. This requires additional moral considerations to which emotions are an indispensable guide. Since there are no moral or emotional experts in a way that there are technological experts, and because of the moral principles of autonomy and equality, the emotions and moral views of the public have to be taken into account in decision
procedures concerning the implementation of risky technologies (‘informed consent’). This can be done through consensus conferences, town meetings (Sclove, 1996) and other democratic decision procedures. Shrader-Frechette (1991) gives a philosophical exploration on how to improve the methodology and procedures of risk assessment in order to make them more democratic and do justice to the fact that risk assessment is an inherently moral endeavor. Jaeger et al. (2001, pp. 159–165) describe the successful application of what they call the ‘Cooperative Discourse model’ in Switzerland at the beginning of the 1990s.

In such democratic decision making procedures about risk, the emotions of the public should be taken seriously. Loewenstein et al. make a similar claim, but their reasoning seems to be mainly instrumental:

Simply disregarding the public’s fears and basing policy on the experts, however, is difficult in a democracy and ignores the real costs that fears impose on people… (Loewenstein et al., 2001, p. 281).

Instead, the argument that I have defended in this paper has been that the emotions of the public have to be taken seriously in order to arrive at well-grounded judgments about the moral acceptability of risks. Purely rational decision procedures overlook important ethical considerations about risks.

Acknowledgement

I would like to thank an anonymous referee for very helpful comments on an earlier version of this article. Work on this article was supported by the Netherlands Organisation for Scientific Research (NWO) under grant number 275-20-007.

References


