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A relational theory of risk
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This paper outlines a \textit{relational theory of risk}. According to this theory, risk emerges from situated cognition that establishes a \textit{relationship of risk} between a \textit{risk object} and an \textit{object at risk}, so that the risk object is considered, under certain contingent circumstances and in some causal way, to threaten the valued object at risk. This relational theory of risk is a theory about the interpretative nature of risk that answers the key theoretical and practical questions of why and how something is considered a risk. The relational theory of risk allows for the interpretation of risk situations as culturally informed, and thereby suggests new ways to approach risk communication, risk governance, and risk management by taking into account bounded rationalities of thought and action.

\textbf{Keywords:} culture; risk theory; social practice; value

1. Introduction

Not all innovative scientific contributions receive the attention they deserve. A case in point in risk research is Hilgartner’s (1992, 40) observation that ‘definitions of particular risks include at least three conceptual elements: an \textit{object} deemed to “pose” the risk, a putative \textit{harm}, and a \textit{linkage} alleging some form of causation between the object and the harm’ (emphasis in original). This observation is not merely an analysis of risk definitions; it is a framework for understanding risk as a social phenomenon. Although the framework describes neither the social construction of the object that can be harmed nor the nature of the relationship between the two objects involved, it innovatively answers the following questions: ‘Why do different individuals perceive the risks of the same technology differently? Why do different social groups develop conflicting definitions of the same technological risks?’ (Hilgartner 1992, 39). More generally, the framework addresses the question of why something is or is not defined as a risk.

Hilgartner’s contribution to the theory of risk has received some attention; for example, Google scholar finds 52 references that quote it (as of 5 February 2010). A look at these references indicates that Hilgartner (1992) is credited, though rather tangentially. For example, Rosa (1998) cites Hilgartner (1992) to claim that ‘our perceptions of risk, our choices of which risks to be concerned about, are equivalent to risk itself’; Klinke and Renn (2002) briefly mention Hilgartner (1992) (wrongly...
spelled as ‘Hillgartner’) as representative of a ‘pronounced constructivist approach’; Power (2007, 25) refers to Hilgartner (1992) to point out that a risk object ‘inhabits a different and dynamic socio-technical network of ideas, resources, experts, regulations, and organizations in which practice is constructed’; and Horlick-Jones and Sime (2004) use Hilgartner’s notion of ‘risk object’ to build an objective–constructionist axis with which they map social science perspectives on risk.

A few researchers have actually noted that Hilgartner’s framework is more than a constructionist approach to risk inspired by science and technology studies. His framework indeed suggests that one should replace the question ‘What is risk?’ with ‘How do people understand something as a risk?’. This marks a substantial shift in research focus that redirects our attention from the ontology of risk to its epistemology, in other words, from the nature of risk per se to risk as a social phenomenon.

The present paper builds on Hilgartner (1992) and other researchers, such as Rescher (1983), Rosa (1998), and Boholm (2003), to present a relational theory of risk. In brief, this theory conceives of risk as resulting from situated cognition that establishes a relationship of risk linking two objects, a risk object and an object at risk, in a causal and contingent way so that the risk object is considered, in some way and under certain circumstances, to threaten the valued object at risk.

The relational theory of risk is an interpretive theory that aims to answer to the key theoretical and practical questions of why and how something is considered a risk. The relational theory of risk also has consequences for how fields such as risk communication (Å. Boholm 2009), risk management (Corvellec 2010a), and risk governance can be understood as specific modes of culturally situated cognition and social practice.

The next section introduces some essential conceptual components of a relational theory of risk. The third section presents the analytical notions of risk object, object at risk, and relationship of risk. The fourth section presents a rereading of selected case studies that illustrates the heuristic potential of the proposed theory. Following these examples, the fifth section discusses the connection between risk and situated cognition. The concluding remarks identify how a relational theory of risk can advance our understanding of risk governance, risk communication, and management.

2. Steps toward a relational understanding of risk

Theoretical perspectives in the humanities and social sciences have underscored the relational nature of meaning: words partly derive their meaning from being positioned in relationship to other words (Saussure 1916), and a sign is the triadic relationship between signifier, signified, and interpreter (Peirce 1998). Likewise, texts derive meaning from their relationships to other texts (Kristeva 1986). Social life can indeed be regarded as a texture of connective relationships, practices, and symbols (Geertz 1973; Latour 2005; Mol 2002). Therefore, the relational understanding of risk is not a creation ex nihilo, but builds on certain converging theoretical trajectories. In the following, we will identify and discuss some of these trajectories.

2.1. A theory of risk object

From a background in science and technology studies (e.g., Latour and Woolgar 1986), Hilgartner (1992) notes that the conceptual structure of social definitions of risk needs to be clarified. He identifies an antiquated artifact-centered view of technology as an
obstacle to understanding risk as social. To extend the work of those who approach risk as a social construct (e.g., Bradbury 1989; Clarke 1989; Douglas and Wildavsky 1982), to mention three of his references, Hilgartner presents a thoroughly constructivist perspective on risk.

Hilgartner’s (1992, 40) key observation is that ‘definitions of particular risks include at least three conceptual elements: an object deemed to “pose” the risk, a putative harm, and a linkage alleging some form of causation between the object and the harm’ (emphasis in original). Focusing on risk objects, he also observes that an object cannot be defined as risky unless, first, this object is first constructed as an object and, second, a linkage is established between this object and a putative harm. The issue, then, if we want to understand how people conceive of risk, is to understand how people construct and develop meaningful networks of causally linked risk objects, a point finely illustrated by Kendra (2007).

A point to underscore is that ‘object’ here and in the rest of the paper is not to be understood in a mere material sense. Object refers to any kind of physical, cultural, or social artifact that can be delineated and singled out. It can be a natural phenomenon, such as lightning, or a manufactured product such as a gun. But it can also be a cultural, representation such as a nationalist ideology, or a social behavior such as a drinking alcohol.

2.2. When value is at stake

However, Hilgartner (1992) remains vague about how this putative harm is socially constructed and about the role it plays in identifying risk. On this particular point, he reminds us of others who also attribute a central role to harm when defining risk, but without theorizing this role. A few sample definitions are: Kaplan and Garrick (1981) posit ‘Risk = uncertainty + damage’; Hohenemser, Kates, and Slovic (1985, 67–8) define risk as ‘quantitative measures of hazard consequences expressed as conditional probabilities of experiencing harm’; the Royal Society (Royal Society 1992, 2–3) sees risk as ‘the probability that a particular adverse event occurs during a stated period of time’; and the Society for Risk Analysis (2008) defines risk as ‘the potential for realization of unwanted, adverse consequences to human life, health, property, or the environment’ (all emphases added). In general terms, harm, damage, and adverse consequences are all essential to the construction of risk, but why this is the case still needs theoretical clarification.

This takes us to the crucial component of value, since phenomena such as harm, damage, or adverse consequences, explicitly or not, presuppose value. As Rescher observes, risk assessment always involves a normative side of ‘evaluative’ issues so that ‘there is no risk assessment without normative evaluation’ (1983, 31) (emphasis in original). Rosa (1998, 28) makes a key contribution to a comprehensive understanding of risk as a cognitive construct by defining risk as ‘a situation or event where something of human value (including humans themselves) has been put at stake and where the outcome is uncertain’. This contribution is acknowledged by Aven and Renn (2009, 2), who state that ‘risk refers to uncertainty about and [the] severity of the consequences (or outcomes) of an activity with respect to something that humans value’. Even Hansson (2010) concludes that there can be no risk unless something of value is involved.

Simply stated, for an object to be considered ‘at risk’, it must be ascribed some kind of value. Paradoxically, little is known about how or why value is established in
a risk relationship. Corvellec (2010a) is an exception who indicates how value derives from organizational practice.

2.3. **Value and relationships are culturally situated**

What is deemed of value is not universally agreed on. In fact, value has innumerable and incongruous sociocultural determinants and manifestations. In anthropology, the notion of culture refers to structured, practice-based systems of situated collective knowledge and understanding used to organize and manage life (Ingold 2000). Culture is a basic prerequisite for coordinated social action and collective projects, and should be understood as a dynamic open system for information processing and making associations, for producing, contesting, and negotiating meaning. This involves, not least, the beliefs and practices according to which value and relationships are defined and articulated, and how people understand contingency and causality.

Notably, a relational understanding of risk draws on the insight that human social systems are conventionally established and are symbolic in nature (Rappaport 1996). That risk varies according to social structure, institutions, values, and belief systems was first mentioned by the social anthropologist Mary Douglas in her critique of psychological studies of risk perception (Douglas 1985, 1992). She argues that how people understand and react to various risks can be explained neither by personality traits nor by the fact that human beings generally act according to any given hierarchy of psycho-physiological needs and preferences; conceptions of risk are instead culturally ‘biased’ by socially embedded values and beliefs.

Since the launch of cultural theory, sociologists and anthropologists have demonstrated, albeit from other theoretical perspectives, that uncertainty and risk are identified, assessed, and understood in terms of knowledge, values, and concerns situated in forms of livelihood, social institutions, historical experience, and collective identity (e.g., Caplan 2000; Grätz 2003; Mairal 2003; Sjölander-Lindqvist 2004; Stoffle and Arnold 2003; Stoffle and Minnis 2008). Situated risk (Boholm 2003; Å. Boholm 2009) is embedded in specific practice-based social contexts in which various actors’ perspectives on and interpretations of risk can vary considerably, even though it is the same external phenomena that are being addressed.

Hilgartner (1992) does not explicitly address the cultural dimension of risk. Though he notes that risk definitions involve a linkage between risk objects and harms, he does not elaborate on the cultural embeddedness of this linkage. A decisive contribution of anthropological studies to a relational understanding of risk is thus to underscore that risk definitions are culturally bound. Understanding risk therefore requires knowledge of the cultural characteristics that subtend how risk is analyzed and defined. Having presented some of the key steps that have led us to a relational understanding of risk, we introduce the relational theory of risk proper, detailing its constituent elements.

3. **Elements of a relational theory of risk**

The relational theory of risk regards risk as a product of situated cognition positing a relationship of risk linking a risk object and an object at risk. Schematically, it defines risk as:
This section characterizes the elements of a relational theory of risk.

3.1. Risk objects

Risk objects resembles hazards in the sense that they refer to something that is identified as dangerous. However, a crucial assumption of a relational theory of risk is that designating an object as ‘dangerous’ does not simply entail affixing a label of dangerousness to something that exists already. Designating something as of one kind rather than another is a constitutive act that outlines the object’s contours. The emphasis on characteristic traits provides the object with an identity; correspondingly, this emphasis involves downplaying other traits of the object and considering them less significant. A double process of selection and conceptualization is at work. This is why we prefer here to speak of ‘risk objects’ rather than ‘hazards’ as the former refers explicitly to something that is produced whereas the latter tends to refer to something that more plainly exists.

As mentioned earlier, risk objects can be natural phenomena, manufactured products, cultural representations or behaviors. The single example of ‘dangerous dogs’ illustrates our point. Designating a specific animal or dog breed as potentially dangerous is a definitional act attributing to it the trait of being ‘risky’. An imaginary perimeter is drawn around certain animals that exclude them from the category of ‘nice’ dogs by including them in the contrary category of ‘dangerous’ ones. Designating a dog type (e.g., pit bull) or dog breed (e.g., Tosa Inu, Dogo Argentino, and Fila Brasilero) as potentially dangerous involves drawing a genetic-cum-behavioral boundary between non-dangerous dog types or breeds and dangerous dogs. Individual animals can then end up being indexed and put on a separate list of ‘risky’ animals, designated as embodied, objectified sources of potential harm.

Designating an object as risky is a creative act, in the sense that it introduces risk into the social space. However, it is not an act that exists in a social vacuum. The designation of a risk object depends on conditions of possibility in the natural and social world. It cannot run counter to acknowledged natural laws or ignore established principles of scientific discovery, rules of media representation, or the game of social forces. The designation of risk objects is culturally constrained, which is why there is no point in claiming today in modern western culture, outside the world of fiction, that humans run the risk of turning into werewolves at full moon.

However, once a risk object has been constituted, it enjoys a certain independence from its context of creation. It stands open to new interpretations, definitions, or contextualizations (Latour 1996), and to a corresponding range of risk-related uses. Dangerous dogs can, for example, figure as arguments in debates about reptiles as pets, as weapons for criminals, or in storylines, for example, in a Hollywood movie about a family dog turning into a rabid monster, as in the film *Cujo* (1984). Risk objects are social in the sense that they are part of social practices and representations, both by being influenced by them and by participating in creating and sustaining them.

The capacity of objects to evade the conditions of their production makes it possible to ascribe them varied identities, depending on the context and who is asked. For example, from being considered a living weapon, a dog can come to be viewed as an innocent victim of human wickedness. The identity of a risk object is fluid (Bauman
2005) rather than fixed. Being risky is a trait that evolves as new dangers are identified and new values are considered at stake. This brings us to a presentation of the second term of the relational theory of risk, namely, the object at risk.

3.2. Objects at risk

The key characteristic of objects at risk is to be endowed with a value that is considered at stake. Value does not refer here to some basic principle according to which one tells the good from the bad based on moral judgments about, for example, freedom or solidarity. Value instead refers to the related but broader notion of something that is held to be of worth, be it life, nature, principles, or a state of affairs. In late modern societies, though, value is increasingly defined in monetary terms (Bourdieu 2003).

Like risk objects, objects at risk are delineated and indexed. However, rather than being assigned an identity of danger and threat, objects at risk are constituted around traits such as value, loss, vulnerability, and need for protection. To put it in an overly dualistic way, objects at risk and risk objects are the complementary figures of Eros and Thanatos: threatened life facing threatening death in the most classic of all dramas.

The act of designating an object as at risk is an act of implicating value. The object at risk is understood as something that ought to be allowed to last, and therefore deserves attention and care. For example, children should be protected from the risk of being assaulted, hurt, or killed by dangerous dogs, and dogs should be protected from careless owners. If designating a risk object is a double act of selection and exclusion, then designating an object at risk is a double act of selection and inclusion. Risk management and governance strive to keep the risk object out and the object at risk in by developing an adequate risk management regime.

There is sometimes agreement in a group or in society as to what is valued and consequently as to what objects should be considered at risk and how they should be protected. Attempts to legislate the presence of dogs in parks can be met with claims that such legislation threatens the legitimate right of dog owners to use parks. Likewise, attempts to control the aggressiveness of dogs can be considered to violate the animal’s biological right to lead a life according to its nature. Like risk objects, objects at risk can always be set in new contexts, the value they embody creating room for reinterpretation and negotiation; what is deemed of value here and now will not necessarily be of value there and then.

3.3. Relationships of risk

Relationships of risk are the third and last constituent of a relational theory of risk. A relationship of risk refers to the relationship an observer establishes between a risk object and an object at risk, the former being held to threaten the value of the latter.

This relationship is, again, a social construct. A relationship of risk does not simply occur; rather, it is a semantic association between objects (van Loon 2002) that must be imagined, crafted, and established. This is done by an observer (e.g., a scientist, local resident, or journalist) subtended by the viewpoints, assumptions, interests, or concerns of the observer. It can be established in as diverse ways as probabilities, models, laboratory tests, narratives, or else. Embedded in the observer’s cultural idiosyncrasies, a relationship of risk reflects an observer’s knowledge and understanding of risk objects and objects at risk (Shaw 2000). The relationship encapsulates the
properties the observer considers prominent, rather than reflecting the properties of these objects as such. One could therefore say that relationships of risk are expressions of cultural preferences.

That a relationship of risk is socially constructed does not mean that it is arbitrary or lacks correspondence with the external world. A relationship between two objects juxtaposed as a relationship of risk must satisfy certain constraints. First, a relationship of risk is contingent, starting with the question ‘What if?’ (Ravetz 1997). The rationale of a relationship of risk is to hypothesize that imagined unfavorable conditions can be met – for example, a dog jumps over the fence into the children’s playground or the H3N8 canine flu virus proves more virulent than expected – and to forecast the consequences of these conditions. Relationships of risk are not descriptions of actual dramas; they are hypothetical or imaginary accounts of dramas that might occur if certain conditions are met. They tell about potential states of things, not actual ones. Risk is a proposition about a change that could take place, but does not necessarily do so.

Second, relationships of risk are causal. A relationship of risk is not a relationship of convenience, similarity, or proximity. A relationship of risk must establish that it is the risk object that threatens the object at risk, how, and possibly why. It must indicate a causal link between precisely these two objects; for example, the dog may jump over the fence into the children’s playground and bite a child, who may then suffer from her wounds. In narrative terms, a relationship of risk establishes a plot conveying that the risk object could affect and modify the object at risk (Corvellec 2010b). Scientific evidence therefore has a privileged position in the creation of risk accounts.

Third, relationships of risk are bound to action and decisions to act (Luhmann 1993). Historically, the notion of risk has been linked to the social institution of high-stakes gambling (David 1962; Gigerenzer 1989; Kavanagh 1993), practices of long-distance trade, maritime ventures, insurance (Luhmann 1993), and an increasingly mathematical understanding of hazard and chance (Bernstein 1996; Hacking 1999). Risk is conditioned by a modern will to know that remains welded to a will to decide and act under conditions of uncertainty. Knowledge about risk serves action, and as a result, a relationship of risk serves the vita activa rather than the vita contemplativa (Arendt 1958). Such knowledge contributes to the capacity to assess, decide on, and govern life, even under conditions of uncertainty.

3.4. Meaningful and changing configurations

One should not be misled by the above characterization of risk objects, objects at risk, and relationships of risk to assume that these terms have a predefined nature waiting to be assembled according to a predefined order. On the contrary, it is only when assembled that risk objects, objects at risk, and relationships of risk receive their identity. An object becomes a risk object only in relation to an object at risk; reciprocally, an object at risk emerges only in conjunction with a risk object, through a causal–contingent relationship of risk that brings the two together. Risk objects, objects at risk, and relationships of risk are not constructed one by one, but simultaneously. Their identity is relational in the sense that it is codetermined when objects and relationships are assembled as a risk construct.

The identity of risk objects, objects at risk, and relationships of risk is also variable. Cultural categories such as danger, value, harm, victim, actor, purpose, decision, cause, and effect are subjected to habitual reframings and reassessments. Moreover,
understandings of risk can lead to action, creating new situations in which new understandings of risk can develop. The semantic networks of meanings within which risk definitions are embedded are therefore continually changing. As a result, there are never risk objects, objects at risk, or relationships of risk per se. Instead, the identities of risk objects, objects at risk, and relationships of risk are continually reframed and redefined. Several identities can even coexist as various people or groups entertain various views in parallel. It is not a fixed ontological feature of a phenomenon to be a risk object, an object at risk, or a relationship of risk. The ontology of a risk object, object at risk, or relationship of risk is variable, as Latour (1996) puts it. What is a risk object for some can be an object at risk for others. Likewise, the risk objects of today may easily become objects at risk tomorrow.

Consider the example of a dog as a threat to a child. One could simply consider the child as an object at risk and the dog as a risk object. However, one could also take into consideration that the dog owner has a responsibility to educate and train the dog so that it does not inflict harm. According to such a view, the dog owner becomes the principal risk object and the dog becomes a secondary one. One could even consider, from an animal rights perspective, that a faulty dog owner is a risk to his or her ill-behaved dog. In this risk definition, the dog is positioned as an object at risk because it is understood as being harmed by the dog owner’s negligence. From another perspective, the commercial promotion of fighting dog breeds can be considered a cause of the propensity of aggressive dogs to attack children. In such reasoning, dog breeders can be considered the primary risk objects, turning both dog owners and dogs into secondary risk objects. Still, these shifts of perspectives and definitions and the resulting changes in semantic network configurations keep the child as a primary risk object. This example illustrates how elements such as dog, dog owner, dog breeder, and child, depending on how a complex causal relationship is profiled (M. Boholm 2009), can be arranged differently depending on the definitions of risk objects, objects at risk, and relationships of risk.

That the apparently simple example of a dog threatening a child can lead to so many risk definitions explains the difficulties and ambiguities pertaining to risk management and governance. If the risk object is the dog owner, risk regulators might introduce dog-owning licenses, or they could introduce high liabilities in cases of dog-induced harm, to make dog owners financially aware of their responsibility. If the risk object is dog breeding, however, regulators could instead attempt to direct the industry, for example, by relying on the directive capacity of kennel club associations or by cataloging and banning certain breeds. Correspondingly, if the emphasis is on children as objects at risk, park authorities might produce elaborate rules of conduct and restrictions on the presence of dogs in public space. However, if the emphasis is on the dog as a risk object, risk regulators could instead demand protective measures, such as dogs wearing muzzles and being kept on leash in public places. Public policies concerning dangerous dogs can combine several of these measures, and the lack of regulatory harmonization between countries, even within the EU, is a clear indication that the framing of the dangerous dog risk is permeated by cultural assumptions about the nature of dogs and their relationships with humans (Lodge and Hood 2002).

A relational theory of risk explains why the social and semantic order of risk is a changing one. More generally, it explains that risk is an epistemic construct that serves to categorize external objects in relation to other objects depending on what we know and believe regarding the contingent character of the potentially harmful causal relationships involved. Risk definitions function as a semantic frame for relationships,
objects, and categories (Fillmore and Atkins 1992), creating the possibility of assessing projected outcomes (Hilgartner 1992; Luhmann 1993). A risk is always a danger of something (sometimes natural, sometimes social) to somebody in a given social nexus (Gregersen 2003). Risk definitions introduce moral orders of blame (Douglas 1992) and a corresponding order of governmentality (Dean 2010; Foucault 1991). It is therefore not an essential feature of phenomena as such to be either risk objects or objects at risk (Ewald 1991), and a crucial implication is that any single phenomenon can simultaneously be regarded as a risk object, as an object at risk, or as having nothing to do with risk, by observers operating under different assumptions.

Some examples are cited below to illustrate the heuristic potential and implications of a relational theory of risk for new understandings of risk communication, risk governance, and risk management.

4. Examples

The heuristic potential of a relational theory of risk can be illustrated by rereadings of some case studies. To begin with, Mairal’s (2008) reading of Daniel Defoe’s *A Journal of the Plague Year* (1998) illustrates how risk accounts have long been relational. Defoe’s book is about the plague that lashed London in 1655. It is a novel, but one based on careful research (including Defoe’s firsthand experience as a child survivor of an epidemic), delivered as a first-hand account. *A Journal of the Plague Year* was published in 1722; several years later it was confirmed that the plague had returned to Marseille in Southern France, triggering massive popular uncertainty. With *A Journal of the Plague Year*, Defoe wished to help prevent a new plague from reaching London.

For Mairal, it is telling that Defoe did not use mathematical calculations but a sophisticated narrative to convey the risk that England could be hit again. For Mairal, *A Journal of the Plague Year* is a landmark indication that the emergence and diffusion of the notion of risk in European culture might owe less to the development of probability and statistics for decision-making, than to the production and diffusion of non-quantified narratives about the possibility of negative events.

Examining the case from the theoretical perspective of relational risk would add the insight that Defoe’s work provides an early example of the understanding that risk is a matter of connecting things. Connecting the plague of 1655 to the plague rumors of 1722, Defoe creates a persuasive tale about a dreaded risk object threatening public health. This emphasizes the need for appropriate measures to be taken, explicitly illustrating the relational nature of risk communication, risk management, and risk governance.

Rereading other cases in light of a relational theory of risk can highlight how risk definitions hinge on the relational construction of objects at risk and risk objects. Stratman et al. (1995) provides a first example. This study of how residents of Aspen, Colorado, opposed the US Environmental Protection Agency (EPA) plan for a massive cleanup of toxic lead mine wastes illustrates the failure of authorities, and refusal of audiences, to create a common object at risk, namely, the health of Aspen residents threatened by lead found in contaminated ground. The authors refer in their analysis to disagreement over the rhetorical stases to be debated, that is, differences in views among the actors as to what constitutes a problem. The EPA has a governmental mission to protect public health, and was concerned that the public could be harmed by lead contamination; Aspenites, however, lacking actual evidence of lead in blood samples, disputed this risk. For Stratman et al. (1995, 21), the two parties were
involved in a ‘rhetorical competition for control of the stases, the ownership of the risk communication protocol and risk expertise’. Without challenging this claim, we can add, on the basis of a relational theory of risk, that the EPA risk communication failed because it did not convince Aspenites that their health was threatened by lead. In this case, no stable relationship was established between an object at risk and a risk object.

Stoffle et al. (2004) describe a similar case but with reversed roles. Their study concerns a proposed bridge across the Colorado River to reduce risks related to vehicular traffic crossing via Hoover Dam, which met with resistance from the Southern Paiute, Hualapai, and Mohave peoples. Hoover Dam is located in the midst of a landscape of great ceremonial significance to these peoples, namely, where the Creator saw the creation occur. While the planning authorities identified no significant heritage at the intended project location, representatives of these peoples argued that the bridge would adversely affect cultural and religious values important to them. The tribes eventually managed to have the location officially listed in the National Register of Historic Places, but to no avail, since registration came well after bridge construction was underway. For Stoffle et al. (2004), the case is representative of the arrogance with which Native American cultures are forced to suffer irremediable losses. The case also illustrates how definitions of what constitutes a risk depend on what is considered of value. A relational theory of risk reading of the case suggests that Native American people did not succeed in convincing public authorities of the value of their ceremonial landscape and therefore failed to construct the site as an object at risk in the official planning process. The authorities, on their part, managed to constitute motor vehicle accidents as a risk object worth risk management attention. This brings us to the fascinating issue of the political and administrative dynamics of risk objects and objects at risk.

Studies by Boholm (2005, 2008; Å. Boholm 2009), Boholm and Löfstedt (1999; Löfstedt and Boholm 1999), and Sjölander-Lindqvist (2005) on the protracted and troublesome building of a railway tunnel through a ridge in southern Sweden provide telling narratives of the changing nature of risk objects and objects at risk. This ridge is situated in a pastoral agrarian landscape with high nature values. It has a complex geology, due to high groundwater pressure, porous rock, and unstable clay, giving rise to major construction difficulties for engineers, builders, and officials from the National Rail Administration. At one point, water leaking through the tunnel walls turned out to be particularly problematic. Such leakage noticeably reduced the groundwater that has made the soil fertile and the land suited for animal husbandry, permitting agriculture on the top of the ridge. Leaking water became a source of major conflict between, on the one side, the local farming community and other affected local residents and, on the other side, the tunnel builders, contractors, and Rail Administration officials. This conflict resulted from two disparate constructions of the risk (Boholm 2008; Å. Boholm 2009). The tunnel builders framed the tunnel under construction as a complex, expensive, and vulnerable technical artifact – and thus as the object at risk – whereas they regarded the ridge and its geological characteristics, such as an extremely high groundwater pressure, as a risk object. Local residents, however, held a different view. For them, the tunnel was not an object at risk but a risk object. Since groundwater leakage was construed as an effect of tunnel construction, residents considered the tunnel under construction as a threat to the ridge, its fertility, its sensitive ecological system, and its favorable conditions for agriculture. Adopting specific situated perspectives (Ingold 2000) and considering different things as valuable, tunnel builders and residents constructed opposing views of the tunnel
and the ridge as object at risk and risk object. That actors can change the identity of risk objects and objects at risk so radically so as to invert their identities, each identity being as real as the other, is a valuable finding that explains, among other things, the duration of the controversy that subsequently arose.

These examples illustrate how a relational theory of risk can enhance our understanding of risk, and therefore of the conditions of risk communication and governance. To further this understanding, we will briefly discuss risk as a product of situated cognition.

5. Risk as emerging from situated cognition

A central tenet of the relational theory of risk is that, for the world to make sense, people need to differentiate and categorize events, objects, and beings in time and in space. As Lakoff (1987) observes in the opening of his brilliantly entitled Women, Fire and Other Dangerous Things, the idea of categories has been with us for more than 2000 years. Categorizing is one of the most basic things we do, and we learn from early childhood how to see things as kinds of things. We categorize without even thinking of it (except in problematic cases), and could not function without categorizations. Considering that we reason more in terms of categories than of particular things, we need to work out how categories act.

To categorize and classify is indeed human, as Bowker and Leigh Star (1999) observe. Classifications express historical views, moral judgments, political priorities, and, not least, practical needs. Classifications create and maintain social orders. Even when their origins and rationale have been forgotten, classifications keep structuring individual and collective understandings of what should be done, and how and why.

Without categories and classifications, indeed distinctions, the world would appear a mere undifferentiated flow of meaningless sensory impressions (Hanson 2000). The distinctive contribution of a relational theory of risk is to offer a framework for examining how people produce, elaborate, and act on categories and classifications pertaining to risk. It provides a tripartite deconstruction of risk elements that rest on notions of value, harm, and contingent causality. Moreover, it invites us to use this tripartite deconstruction to analyze how individuals and groups build semantic networks comprising objects at risk, risk objects, and relationships of risk, and how these networks evolve over time.

All humans have similar sensory–neural faculties, but how they frame and understand what they observe depends on a combination of their personal histories, functional positions as observers, and surrounding circumstances (Goffman 1974). Psychometric studies of risk (Slovic 2000) offer abundant evidence that the context dependency of perception is particularly true of risk perception. The categories and classifications that we use to interpret, produce, and share information entail analytical abstractions and conceptual schemata that order concepts in relation to other concepts. However, to be viable in practical life and allow for adaptation under shifting circumstances and changing environments, categories and classifications must have a certain cognitive flexibility (Ingold 2000). Assumptions deriving from a variety of sources – for example, personal experience and practice, second-hand information (what we hear or read), rumor, tradition, common sense, or scientific exploration – provide new input into the categories we use. In philosophical terms, there is therefore no absolute difference between analytic and synthetic knowledge (Quine 1951).
Cognition takes place in practical life (Mol 2002). It is contextual and embedded in practical engagement, actions, and interactions in the lived-in world (e.g., Lakoff 1987). Categories and classifications are, for example, not merely conceptual, in the sense of being abstract cognitive modules, but also practical, in the sense of issuing from and being dedicated to actual activities, and therefore often material, in the sense of being inscribed, transported, and affixed to ‘stuff’ (Bowker and Leigh Star 1999).

A major thrust of the relational theory of risk is to focus on the ‘social actor in action in the lived-in world’ (Lave 1988, 13), to explain how risk definitions are cognitive operations that emerge not in the intangible world of concepts, but in the lived-in world of livelihood, dwelling, skill, and engagement (Ingold 2000). Risk definitions are situated expressions of individual and collective understanding. As our rereading of the case studies above reveals, risk definitions are practical outcomes of actual engagements with the world, and concern agency and planning, intentionality and action, decision-making, and any other matter that constitutes the social.

Risk definitions are socially situated cognitive outcomes, so risk researchers should examine the individual and social practices that constitute the social. To understand risk definitions, risk researchers should delve into the logic of practice (Bourdieu 1992), analyze how people organize their experience (Goffman 1974), and follow how they navigate their everyday lives (de Certeau 2002). One must concretize the study of risk objects, objects at risk, and relationships of risk from where these are imagined, described, discussed, stabilized, and (in some cases) naturalized, for example, in communities of practice (Wenger 1998) or organizational contexts (Nicolini, Gherardi, and Yanow 2003; Schatzki, Knorr-Cetina, and Savigny 2001). To address the socially shaped cognitive construction of risk, risk research should address how risks are assessed, investigated, managed, and communicated, taking account of all possible perspectives and assumptions that plural and complex societies harbor. Our contention is that a relational theory of risk, because it provides a clear analytical focus, can provide substantial new insight.

6. Conclusions

This paper presents a relational theory of risk. According to this theory, risk is a product of situated cognition that establishes a causal and contingent relationship of risk between a risk object and an object at risk so that the risk object is considered, in some way and under certain circumstances, to threaten the value attached to the object at risk. The paper outlines the main sources of inspiration for a relational theory of risk, describes its key elements, demonstrates how it provides new insights into risk communication, management, and governance, and emphasizes that the theory approaches risk as socially situated.

To close, we identify a few contributions that a relational theory of risk can make to risk communication, risk management, and risk governance. Common to all these contributions is that a relational theory of risk can explain the dynamic of the social construction of risk objects, relationships of risk, and objects at risk.

To begin with, a relational theory of risk suggests that risk is a semantic creation that occurs within the communication context. A relational theory of risk also suggests that effective risk communication hinges on an understanding of the dynamic of objects at risk, relationships of risk, and risk objects. In particular, it depends on the understanding that this dynamic is not merely a matter of one party (e.g., experts) convincing another (e.g., the public) on rational, emotional, or cultural grounds of the
actual state of things. The heuristic scope of such a conduit view of communication is limited, as it ignores the fact that signs and audiences are actually active participants in the communicative act. Risk communication is a matter of fitting the cognitive systems of the parties involved into a specific way of causally relating a contingent threat to a possible loss of value. Put plainly, successful risk communication (if such a thing exists) depends on a common understanding of what constitutes a threat, a value, a contingency, and a causal relationship. Understanding, not convincing, is the key. The crux of risk communication is for one party to understand how the other conceives of a risk object, an object at risk, and the relationship of risk between the two (Å. Boholm 2009). A relational theory of risk therefore implies both a research and a practical agenda.

To continue, the theory’s contributions to risk management and risk governance are indeed quite similar. Risk management at an organizational level or risk governance at an institutional level should start with the same tasks of identifying what is at stake, what is a threat, how one relates to the other, and why (Corvellec 2010a). This can be done with the help of probabilities, modeling, experiences, narratives, or else. Again, understanding is the key, although it now serves as a springboard for decision and action. We cannot address here how risks should be assessed, investigated, and managed in a complex society. However, we suggest that, informed by a relational theory of risk, it would be vital to look at value before looking at threat, look at vulnerability before resilience, stay critically focused on the dynamic of human creativity, and be as aware as possible of the social conditions of cognition of the parties involved. Again, this is as much a research agenda as a practical one, which is an indication of a robust theory.

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