

Risk as mediation - societal change, self-endangerment and self-education

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Introduction

The paper picks up the rhetoric of risk as an adequate discourse to reflect upon current modern societal change, self-endangerment and self-education. Linking ideas of Actor-Network-Theory and risk analyses it offers an understanding of risk as a complex process of mediation of endangered futures that can be seen as central for rethinking (self-)educational efforts in world risk society. Drawing upon the current global financial crisis I outline briefly how risks can be described as networks mediating network effects. Secondly, I will show that modern risks refer to 'self-manufactured uncertainties' (Giddens) and how these risks can be understood 1) as effects of human action and 2) as culturally diverse cognitive schemata to understand and (re-)organize societal life. Next, I will go beyond a mere cognitive model of risk; I explore 'risk' as a complex process that mediates space and time, difference and heterogeneity, that creates low-risk and high-risk scenarios. High risk scenarios (such as the global financial risks, high-risk techno-scientific innovation, the ecological crisis, and biographical risks) that disrupt, question and alter individual as well as societal life will be discussed alongside the concept of the 'rhizome' (Deleuze and Guattari, 1987). In a brief analysis of the SARS outbreak in 2003 I will show how the mediation of high risks - as a process of self-education - may enact new ways of understanding and coping.

Keywords: risk, mediation, society, self-education

I. Cutting the Money Network - Current Financial Risk and Their Effects

On the 5th of October this year one read in the French newspaper *Le Monde* the following heading: 'Les Etats-Unis confrontés à un sérieux risque de récession' – "The United States confronted with the serious risk of recession". The article then reflected the financial crisis and possible dramatic effects on the USA. As we know today, due to systematic financial malpractice, it is not only the USA which is confronted with the effects of 'organized irresponsibility' (Beck, 1995). Rather, the risk-reward ratio of

financial practices turned into a global financial crisis, which already shows its negative effects: traditional, major financial organizations like Lehman Brothers have had to close, the car industry has slowed down or even stopped production, etc. But not only banks may go bankrupt, not only the economic sector is tackled and not only on a national level. The financial crisis and the possibility of a global recession comprise risks which will affect everybody. It is not merely sectorial and/or national affair but a global one and it is not bound to the economic sphere but poses serious danger for the socio-political order of all societies. Facing such a 'world risk' (Beck, 2007) and anticipating dramatic effects unravel globally distributed and often connected discourses of what I like to call 'self-education'. The latter includes diverse social, political, and economic concerns, which nevertheless share attempts to articulate pre-cautionary practices, to possibly avoid related negative and adverse societal consequences of that risk.

The global financial market crisis induces an all-encompassing risk and danger since money plays such a crucial role in our daily modern life, precisely since it acts as the prime mediator of goods within capitalist organisations. Money enables and/or disables ordinary life depending on whether one has money or not; it secures our life as much as it may put it at risk. Thus, it is no wonder that it is associated not only with economic value but also with a wide range of symbolic and emotional meanings (Furnham and Argyle, 1998).

During a financial crisis everyday life is at risk globally since money stops working as a unity of account, exchange, and referencing value. This happens precisely when money no longer circulates and therefore it cannot act as a major tool for mediating human life issues. Where there is no money there is no financial circulation and mediation of goods is impossible. Paradoxically, in the moment of scarcity one becomes aware that money is a network affair with network effects criss-crossing the economic, political, judicial, social and individual, public and private spheres that may radically question common modes of societal orders of capitalist production and consumption. One can say that a world economy like ours cannot rule out such 'normal accidents' (Perrow, 1984) since it refers to complex and tied couplings of heterogeneous networks that are both stronger and weaker the more they are associating different elements (Callon, 1998; Callon et al, 2007). This is the strength and the crux of mediated/ing networks. Networks gain power the more they connect heterogeneous entities. But this makes networks prone to weakness as well, since every local failure or cut in the network may produce global effects due to its tied connectivity (Latour, 2005).

As the French sociologist and philosopher Bruno Latour has stressed, money acts as intermediary 'that links goods and places' (1990, p58). It turns human relations into relations between subjects and objects: Subjects that calculate and objects that are calculable (Schillmeier, 2007b). The German sociologist Georg Simmel (1989, 1992a, 1992b) pointed out how money relations affect the velocity of modern cultural life and of how money individualises it – as it is the most suitable substratum for private and personal property (Simmel, 1989). Money in its various material and virtual forms is 'mobile ..., combinable, and can circulate through different cultures, it is immutable ..., it is countable ..., combinable, and can circulate from the things valued to the center that evaluates and back' (Latour, 1990, p58). With the financial crisis we become aware of how processes of intermediation pose a risk, of how financial practices can go wrong in a most threatening way: we face a scarcity of money that cutsⁱ into the financial flow and money networks. It makes people stop spending money as they anticipate that there might be no money in, and for, the future; people lose trust and confidence in financial institutions that are meant to be expert-mediators of risk-ratio award practices. Spending money becomes a risk. Those institutions, which are thought to secure money networks and make money work and flow, put at risk their own future and the future of associated networks. In effect, the industry (eg the current situation of the car industry) is taking the risk of slowing down or even stopping their production, anticipating that people will not take the risk of spending money. This in turn produces political risks, the

risk of unemployment and other related social risks, etc. These may lead to a risk spiral that mediates virtual risks with actual effects, global processes with individual concerns, the economic sphere with the political and social sphere etc. In summary the financial crisis not only endangers the (inter-)mediation of money practices but may change individual and collective human life on a global scale. Global intermediaries like money are global mediators of risk.

With this in mind, we can address possible implications for contemporary education practices. Current societal relations cannot be understood adequately if we consider societal spaces as containers that define the local, regional, national or global affairs. Rather, the network structures of globally diffusing world risks demand a 'trans-container perspective' that does not relate fixed, organized units but focuses on the very societal affairs *in the making*. Such a processual view may help to unravel the propagation of human practices and the emergence of global risks. If we consider the organization of societal affairs as the outcome of propagating practices, we may also think about education as *in the making*. Educational attention, then, is given to the double bind of the production of multiple futures as a highly risky affair of the present. Understanding risk adequately is to see not only the dangers but also the chances risks indicate.

The 'self-education effect' of understanding risk turns our focus to the mediation of present practise into future effects. More precisely, it allows an examination of how the anticipation of endangered futures may help us to re-think our past and possibly change our current practices that have lead to such risks in the first place. Education may help us to live under conditions of self-manufactured uncertainties or risks and may facilitate to take care about how our practices associate complex networks in space and time. Education that deals with complex network processes centres the crucial importance of mediation. Mediation, understood as the association/translation of networks means 1) a mapping: ie 'a relation that does not transport causality but induces two mediators into co-existing', and 2) a 'tracing': if some causality appears to be transported in a predictable and routine way, then it's the proof that other mediators have been put in place to render such a displacement smooth and predictable' (Latour, 2005, p107). Education, then, educates itself along the configuration and diffusion of risk-networks that shift between a mapping and a tracing. Doing so, it may also educate how to contribute to trace the complex mapping of risks and may lead to the pre-cautionary principle that deals with the sustainability and the possibility of the production of multiple futures.

Educational institutions may well be advised to use this insight as a core principle to inform their work and to focus on societal networks that mediate otherness and heterogeneity: the past, present and the future, the local and the global, the private and the public, the collective and the individual, the human and technology, nature and culture, cultural diversity, etc. The dynamics of mediation may help us to understand related hybrid forms of emerging societal reality and agency in late modernity. The latter visualize reality as a process of mediating heterogeneous elements, which, due to its contingency (for good and/or bad affects), are in principle risky and uncertain processes.

Mediation understood like that offers the possibility of understanding different identities and realities not as a mode of exclusive perspectives but rather as a mode of inclusive differences (Schillmeier, 2008b). Whereas the former focuses on the exclusion of difference, diversity and heterogeneity, the latter refers to the process of mediation of the different and heterogeneous in order to understand current societal processes of belonging, of emerging agency, identity formation, ie subject- and object-formation of all kinds, etc.

Education itself, like any other institution that prepares us for, or regulates, our future in order to make it more comprehensible, can be understood as a crucial mediator and by

doing so gains credibility and trustworthiness. As a *center of mediation*, education, then, enables us to reflect upon and deal with issues of uncertainties and risks that are most prominent in everyday practices of late modernity. At the same time education as well as all institutional practices that deal with our future, is part of mediating realities and hence produces scenarios of risk and uncertainties as well. Thus, education may be a central, publicly accessible but highly disputable set of practices by which the mediation of reality is its main objective of interest.

II. The Modernity of Risks

Obviously we have always been living in risky and uncertain times. However, the 'semantics of risk' (Beck, 2007 p19) do describe a very specific, that is *modern*, condition of human living. Risks appear as a mode of 'manufactured uncertainties' (Giddens) of human, socio-historical organization and not as given natural risks or risks imposed from outside society (eg by God). In the modern world we face and take risks precisely since science and philosophy have 'discovered' that our world is not a pre-given reality but the outcome of our own practices and related decisions that could be done otherwise. In contemporary times risk analysis is conducted to anticipate and lessen adverse events, if not to prevent them.

Quite different to tradition that dealt with a pre-given world, modern times have a past, present and future. We have a past that offers possibilities for present action that contingently shapes our possible, open futures. In the modern world we mediate time; mediation takes time and may happen at the same at different places differently. Whenever time goes by things may change, for the better or the worse: they multiply, so to speak. Under conditions of modern times, where the past is experienced as different from the future, time is mediated by a third element: the present. Present times mediate the gone past into the future open. Such time-relations are intrinsically risky since it is precisely our decisions that mediate between the past and its futures. By our decisions change is introduced, which may be good or bad. Modern risks, then, are inner-societal, decision-dependent phenomena that articulate possible future dangers that are affected by mediating the past into the future by present societal practices (Zinn, 2008). This holds even if we decide under such uncertain conditions *not* to decide to do this or that. Even then we cannot escape the riskiness of our practices.

Modern time appears in a linear and not circular way. The modern world is an *open* world that deals with a self-made reality that unfolds its risky future. Risk practices shape our future for the better or for the worse; they unravel chances for the better and dangers to get it wrong. Mediation is also complicated by sociality inasmuch as we consider 'the social' as the mediation of different and heterogeneous entities. Human societies can be considered as social arrangements when different mediations happen at the same time (*cf.* Mead, 1938). Bearing in mind what we have said in the last section, it is precisely the endurance of the riskiness of our practices that should be central for (self-)educational efforts.

Modern practices face the complexity of contingency inasmuch as they transcend fate and tradition. Modern practices herald the end of the nature of things as given realities. In his appraisal of Michel Foucault's work on modern human sciences and philosophy, Gilles Deleuze has pointed out that it is the very difference between 'seeing' things and 'saying' what we see that lies at the heart of the modern ethos (Deleuze, 2006).

It has been humanities and the most influential work by Immanuel Kant that makes us aware of such a relation that is predominantly a human one. Kant is an important writer as he put an end to the old European Cartesian effort of placing rationality into the nature of things (Kant, 1977). Rather, nature can only be understood as *human* nature since there is time going by between seeing things with our senses and saying what they are with the help of our self-reflective mind. It is human rationality that mediates pure

sensation into human perception. The nature of things, then, is always mediated nature. This is the lesson from an enlightened form of education. From a Kantian view, we humans mediate things into being; humans give things their nature by thinking. Otherwise, things are not part of human nature but remain *Dinge an sich* about which we can say nothing since we know nothing about them. In such a reading, we educate the nature of things into human nature. Hence, to care about the nature of our lives on this planet is to care about the human world as a mode of using human rationality.

In that sense, Kant can be read as a mentor for risk studies and modern education. His *Copernican Revolution* centres human thought as a mode of rational calculus that orders the plurality of human perception. Rationality is seen as the ineluctable mode of mediating vs. ordering and education, generalizing and governing the manifoldness of human, self-manufactured realities. In the late 20th century, Jürgen Habermas's model of public mediation by communicative rationality is based on Kantian insights. It offers a very modernist contribution to risk studies and education. Thus we have become aware that we are educated by our minds, 'that the objective world is not simply ontologically given, but one to which we relate pragmatically through our instrumental, linguistic and communicative practices' (Strydom, 2002, p151). This in mind, cognitive theories of risk are interested in evolutionary learning processes. The latter lead to pragmatic action as the 'mediation ... of cognitive structures' in the minds of individuals, collective cognitive structures such as collective actor identities, organizational frames and ideologies, and ... cultural cognitive structures' (Strydom, 2002, p149) acted out, for example, by social movement.

In such a reading, social movement is 'not just a collective actor, but rather a creative cognitive process in which new knowledge, new cognitive structures, and a new cultural model are produced and communicated' (*ibid.*, p150) that mediate issues of risk against the background of collective vs. global responsibility. Social movements, then, can be conceived not only as non-governmental organisations (NGOs), but as non-institutional forms of modern *education in the making* that question common modes of understanding social relations (Epstein, 1996; Callon and Rabeharisoa, 1999; Dodier, 2003). The mediation of risk by cognitive structures comprise a major cognitive scheme of education, which, by 'processes of communication and discourse in the transformed public sphere of twentieth and twenty-first centuries' (*ibid.*, p164) unravels 'a major mode of the constitution and organization of society' (*Ibid.*, p163). Following such a cognitive perspective 'risk is a culturally constituted cognitive scheme according to which people not only experience, interpret and understand their world, but also orient their actions'. Moreover, 'risk refers to dangers or threats, ... a reality that entails potential adverse effects' (*ibid.*, p162), that enacts new public forms of self-education, which may lead to new socio-political actors like social movements.

III. Risk as Mediation

Classical psycho-social and/or social and social anthropological risk studies conceive risks as mediating cultural practices and rational communication under conditions of potential uncertainty with possible educational and learning effects. Obviously such an understanding of mediated risk practices challenges any static forms of educational objectives. As we have seen, risks become human affairs inasmuch as risk depends on human perception (rationality). Moreover, risks are socially and culturally constructed since the members of human societies may perceive things differently at the same time at different places (Luhmann, 1991; Beck, 2007). Following from that, global forms of education seem almost impossible if we consider the societal practices as mediated by time and space. Rather, we may find multi-contextual realities that demand their own self-generating educational content and form.

Beck rightly points out that risks have to be differentiated from the effects of risks. The former are the anticipation of the latter. Risks are anticipated risk effects, and the

experience of risk effects (global warming, Chernobyl, financial crises, etc.) affects the ways of dealing with and taking risks. World risk society turns our attention to the production of, and dealings with, highly politicized, globalizing risks and risk effects. These risks and risk effects are linked with and affect globally-spreading scenarios of fears and anxieties, which, in effect, shape, discipline and control our daily practices. Under conditions of a world risk society we constantly have to decide upon our futures precisely against the background of these self-manufactured uncertainties and global risks that render their spatio-temporal ontologies empirically open. Hence, a world risk society is an attempt to unravel the complexities of trans-local, transcontinental and global phenomena *in the making*.

Taking the risk of risk practices (eg the financial speculation as described above) is risky and produces risky decision where it remains risky, ie undecidable, if the effects are good or not. This threefold tautological argument describes most precisely the 'strange' ontology of risks. Risks do not have a beginning nor an end; they are no essences, no substances, no beings, no self-sufficient phenomena in space and time. Rather, they depend on human and social practices that put at risk the unquestioned reality of things. Risks, then, visualize the human and social dimension of things: they are disputed matters of concern. If things are seen as the effect of risk practices they unfold their more or less fragile sociality, which nevertheless opens up spaces to think and do things otherwise. Still, sociality – and that is its ontology – is essentially risky. In that sense, risk is our prime educator to understand the social dimension of our world, which in turn allows the conception of the social dimension of education in the first place. However, it is the very sociality of education that puts at risk any global form of education. The mediation of risks transforms institutionalized forms of education into publicly discussed 'self-educated' future orientations of our life.

Risk practices are social inasmuch as they mediate beginnings and ends of societal dynamics. Risk practices, we may say, mediate things into being and thereby constitute the sociality of affairs. This, obviously, entails 1) a huge potential for creative action (principle of agency by anticipation of risks), 2) may have good and bad effects (principle of undecidability) and 3) refers to a highly demanding situation where communication, and with it the production and consumption of knowledge, is entrenched by non-knowledge, ignorance and unawareness (principle of uncertainty). Communication may also fail due to the 'tyranny of contingency' of things, which as self-made, risky objects may always refer to something else (principle of contingency). Generally speaking, when talking about things as risk objects we have to acknowledge that these objects are mediated practices.

IV. The Virtuality of Risks

According to Beck, financial risks are, next to ecological risks, terror risks (and biographical risks, *cf.* Tulloch and Lupton 2005) the most serious versions of high order risks that describe 'world risk society' (Beck, 2007). High order risks transcend the idea of risks as mathematically, economically and scientifically calculable and insurable since world risks extend beyond local, regional or national affairs, transcend the logics of clear identification and blur the differentiation of risk producer, risk decider and the affected by these risks (*ibid.*, Luhmann, 1991)ⁱⁱ. Such 'systemic risks' (Renn et al, 2007) and risk effects originate as highly mediated and complex assemblages of societal practices (Urry, 2004). They protract into an unknown future where they may relate with other risks and risk effects. Thus, systemic risks are highly difficult to deal with or compensate with common modes of institutionalized practices (like the insurance principle, limit values etc.) (*cf.* Renn, 2007a,,2007b).

Globalizing risks are anticipated virtual realities that have not yet materialized but nevertheless induce complex ways of acting in the present (Beck, 2007; van Loon, 2002; Schillmeier, 2008a; Schillmeier and Heinlein, 2009a; Shields, 2006). When such virtual,

anticipated future events become actual and true, then risks turn into adverse risk effects. Both risks and their effects are real inasmuch as they provoke (re-)action. What makes world risks so challenging for contemporary societies is, according to Beck and others, that they transcend the possibilities of institutionalized forms of action that have provoked the risk in the first place. Conceived like that, risks and risk effects demand societal practices that experiment more and more with 'the virtual' and less with the 'the possible' (Deleuze, 2001, Levy, 1998, van Loon, 2002, Shields, 2002). What does this mean? And what does this mean for educational issues?

Realizing societal practices obviously means a narrowing down of possibilities. These possibilities are always more than can be realized. At the same these possibilities lack existence. Such a real/possible relationship gains a total different meaning if considered virtual. This is precisely what risk practices make us aware of: being virtual, risks are not opposed to the real, rather virtual risks are always real inasmuch as they pose, discuss and affect actions, action, in very political sense to do things differently. Whereas the possible is less than the real, the virtual actualizes reality. In effect, the virtual doesn't resemble the real it actualizes, but introduces the new: it is a creative act. As Elizabeth Grosz (1999, p27) stresses:

While the concept of the possible doubles that of the real, the virtual is the real of genuine production, innovation, and creativity. It is only actualization that engenders the new. The process of actualization is one of genuine creativity and innovation. Where the possible/real relation is regulated by resemblance and limitation, the virtual/actual relation is governed by the two principles of difference and creation. For the virtual to become actual, it must create the conditions for actualization: the actual in no way resembles the virtual. Rather, the actual is produced through a mode of differentiation from the virtual, a mode of divergence from it, which is productive. The process of actualization involves the creation of heterogeneous terms. The lines of actualization of virtuality are divergent, creating multiplicities, the varieties that constitute creative evolution. This is a movement of the emanation of a multiplicity from a virtual unity, divergent paths of development in different series and directions.

The realization of the possible and the actualization of the virtual can be understood as two intersecting ways of societal change that describe world risk society. Within world risk society we are dealing with a rather paradox situation. Precisely because we anticipate the risk that future possibilities may harm us (dangers, hazards, catastrophies), that future possibilities may be limited due to our present life activities (life as global hardship, global inequalities, global limited growth etc.) or even extinguished (endangered future and existence), we actualize the virtual that 1) makes us aware of the limits of the real and its possibilities, and in consequence may 2) demand or provoke the chance to do things differently, transgressing and re-configuring common modes of societal orders. Moreover, the anticipation of negative risk effects may evoke 3) pre-cautionary practices and may lead to the discourse of sustainability and new forms of reflexive governance that address the very risk-character of socio-political regulation (Beck, 2006, 2007; Voss, Bauknecht and Kemp, 2006; Renn, 2008; Stridom, 2002; Zinn, 2008).

Due to the 'vague ontology' (Schillmeier, 2005) of risk – its anticipated reality, its virtuality – risk is 1) a highly societally disputed issue and according to Beck (2007, p36), the more risk is contradictory, not-known, disputed and publicly discussed the more it gains existence (*cf.* also Powell, 2007). 2) It remains empirically open if individuals, organizations, institutions or nation-states are able to address risk issues adequately along their own possibilities. 3) Anticipating risks may lead to new forms of social organization that offer new models of risk practices (obviously posing new risks and risk disputes), and 4) the risk discourse often reinforces social practices and

organization that protect themselves against the vague ontology of risk by denying, ignoring or simplifying risk; risks, then, appear un-mediated.

The latter strategies are the extreme version of turning the virtual (the not-known) and its forms of actualisation into the possible (the known) and related, taken for granted forms of realisation. Here, 'the possible' equates with 'the real': self-manufactured uncertainties and questionabilities turn into unquestionable certainties, vague ontologies switch into fixed ontologies. Again, it remains open if the former (real/possible) or latter (virtual/actual) status is good or bad, it remains an empirical question. What makes risk practices such a challenging societal issue is due to its double bind of mediating the realm of the real/possible and the virtual/actual. The ethical question that governs world risk society concerning good and bad becomes a matter of ontologically undecidable risks and related risk effects.ⁱⁱⁱ

These dynamics enact the logic of 'inclusive differences' (Schillmeier, 2008b, 2009a) that bring to the fore the global (educational) demand of inclusion, and not exclusion of difference and heterogeneity in order to act adequately and responsibly within a world risk society. Such inclusive dynamics stipulate the reframing of societal practices linking minds, bodies and things in multiple ways. It enables us to comprehend the transgression of traditional (b)orders precisely as a non-linear process of risk practices. These practices require and acknowledge heterogeneity and difference instead of separating off exclusive spaces that do not recognize the interdependency and inter-connectedness of diversity and otherness (*cf.* Appiah, 2006; Cheah and Robbins, 1998).

V. The Becomings of Risk

Following from the above, risk practices mediate cognitive, cultural, spatial, temporal, material and affectual relations in highly complex, undecidable and uncertain ways. These practices may turn into risk effects that may configure good and bad societal issues. Both risk as the anticipation of something negative and unintended as well as risk effects (as risks that came aversely true) do have a double signature: they may endanger *and* enable societal practices. It is the risk of a self-endangered future as well as the experience of risk effects that turned into catastrophies (like Chernobyl, 9/11, Hurricane Katrina, floodings, Contagan-Affair, Wars, SARS, etc.) that become visible as publicly mediated 'matters of concern' (Latour, 2005) that bring to the fore the risks, uncertainties and dangers that evolve by associating vs. mediating heterogeneous entities.

Matters of concern 'gather' difference and heterogeneity (Heidegger, 2004) and can be described as actor-networks (Schillmeier, 2008a, 2008c, 2009; Schillmeier and Heinlein, 2009). Generally speaking, the notion of the 'actor-network' tries to capture the idea that actors, human and non-human alike, their abilities or disabilities to do things (feeling, thinking and acting) are the effects and affects of associated/ing heterogeneous entities. Hence a network is an actor as much as an actor is a network. By association actor-networks relate time and space. Such a movement refers to a double process of displacement of time and the event of chance, as Elizabeth Grosz (1999, p1/2) has argued:

Time is that which disappears as such in order to make appearance, all appearance and disappearance, that is, events, possible. Its disappearance is twofold: it disappears into events, processes, movements, things, as the mode of their becoming. And it disappears in our representations, ..., whether it is tied to, bound up in, and represented by means of space and spatiality. It suffers, or produces, a double displacement: from becoming to being, and from temporal to spatial. ...Chance is that which signals the openness of the future, its relative connection to but also its relative freedom from the past, the possibilities of paths of development, temporal trajectories uncontained in the present. Chance here

cannot be regarded as indetermination (as it is represented in classical philosophy); rather it is the excess, superfluity, of causes, the profusion of causes, which no longer produces singular or even complex effects but generates events, which have a temporal continuity quite separate from that of their "causes".

With this in mind, one may say that actor-networks translate time into space and space into time: they make up 'time-spaces'. I borrow the notion of 'time-space' from the German philosopher Martin Heidegger. Heidegger's '*Zeit-Raum*' (Heidegger, 1994) marks the *event* that neither refers to 'time' as a mere subjective construction nor 'space' as an objective one. Time-Spaces cannot be thought of properly as the mere effect of the succession of 'nows'. Accordingly time-spaces shouldn't be conflated with measured and countable spaces of time – although the latter play a crucial role in understanding, perceiving and acting in modern times. The process of eventful and thus risky and uncertain association I have called throughout the text *mediation*.

Only through mediation does the composite of our world come into individual being, endures and/or changes. Thus, actors can be understood as mediated mediators. The elements involved may differ in the ways they work as associates: they can be either 'intermediaries' or 'mediators'. An intermediary 'transports meaning or force without transformation', whereas mediators 'transform, translate, distort, and modify the meaning or the elements they are supposed to carry' (Latour, 2005, p39ff). In that sense actor-networks mediate spaces of time and time-spaces and the relationship between time-spaces and spaces of time is that of 'mediation' and 'intermediation'.

An actor-network, then, addresses the very fragile sociality as a process of mediated association; it makes us aware that we live in extension (in time and space). This means that we are mediated through the other (human and non-human alike) mediating time and space as spaces of times and time-spaces. An actor-network conceived as an eventful mode of associated heterogeneities is very much what Gilles Deleuze and Felix Guattari have called a 'rhizome' (Deleuze and Guattari, 1987). Interestingly enough the etymology of the notion 'rhizome' already brings to the fore the close relation to risk:

The term *risk* comes from the Italian *risco*, *rischio* (danger, risk), derived from *rischiare*, *risicare*. The origin of the word is surprising. It must be traced to Greek *rhiza* (root). The word *rhiza* came to designate, in Greek, all which is extended from a trunk in the manner of a root, and later, in Crete, the beach cliffs, formed by the protruding rocks at the foot of the mountain, rather similar to the roots protruding from the foot of a tree. Thus, from *rhiza* came *rhizicon*: something with a similarity to a cliff and hence presents a danger, a *risk*.' (Mathieu-Rosay, J., *Dictionnaire Etymologique*, 1985. In: Recchia, V., 1999, p6).

Next to its etymology that shows the ontological double bind between risk and rhizome, the very characteristics of a rhizome as described by Deleuze and Guattari, proved to be very helpful to understand risk as mediation.

A rhizome is about 1) connectivity and 2) heterogeneity, eg signs and things, humans and non-humans, local and global etc. 'Collective assemblages of enunciation function directly within machinic assemblages; it is not impossible to make a radical break between the regimes of signs and their objects.' (pp8/9) As we have already seen above, modern world risks always have this status of connecting heterogeneous terms. Risks are real *and* virtual, signs *and* things, local *and* global, human *and* non-human, social *and* non-social, material *and* immaterial, good *and* bad, etc. Their vague ontology is given precisely by and through the 'and ... and ... and'.^{iv}

A rhizome is, as a 3rd principle, nothing but mediated association and association is the origin of risk's vague ontology. A rhizome is 'multiplicity' that 'has neither subject nor object, only determinations, magnitudes, and dimensions that cannot increase in number without the multiplicity changing in nature. ... an assemblage is precisely this increase in the dimensions of a multiplicity that necessarily changes in nature as it expands its connections.' (p9) Obviously this principle of multiplicity is not restricted to 'cultural' others (humans); it includes the non-human as well. To include the non-human is the very strength of an actor-network and makes it even stronger for contemporary risk analysis and educational endeavour. The 4th principle refers to the principle of the 'virtual', or as Deleuze and Guattari say, 'unsignified rupture' or 'becoming'. (Deleuze and Guattari, 1987, pp262/63) unfold the 4th principle very lucidly:

[Rhizomatic] becoming is not a correspondence between relations. But neither is it a resemblance, an imitation, or, at the limit, an identification. ... To become is not to progress or regress along series. Above all, becoming does not occur in the imagination [but is] perfectly real [and] produces nothing other than itself ..., [a] becoming lacks a subject distinct from itself; ... it has no term, since its term in turn exists only as taken up in another becoming of which it is the subject, and which coexists, forms a block, with the first. ... Becoming is always of a different order than filiation. It concerns alliance ..., *symbiosis* that brings into play beings of totally different scales and kingdoms, with no possible filiation. [Becoming] does not go from something less differentiated to something more differentiated [but unfolds a movement] between heterogeneous terms (...) Becoming is a rhizome, not a classificatory or genealogical tree.

Becomings or the mediation of risk-actor-networks can be visualized as a map and not as a tracing – as Deleuze and Guattari stress with their 5th and last principle of the rhizome: 'What distinguishes the map from the tracing is that it is entirely oriented toward experimentation in contact with the real.' (p13) This happens precisely if we look at the diffusion and circulation of techno-scientific innovations that are thought to provoke systemic risks like gen-technologies, genetic modified organisms, nanoscale particles, etc. (Krohn and Weyer, 1990; Latour, 2005; Renn, 2008). Consequently, 'world society' turns into 'world experiment society' with tremendous effects. Whereas the experimental invention within a laboratory setting clearly defines the boundaries that separate off scientific from non-scientific practices (closed space, those who witness and those who don't), the diffusion and circulation of high risk techno-scientific innovation challenges these boundaries since virtually everybody may be mediated or affected by them. Consequently, risk and risk effects multiply and so may controversies around and due to these risks and their potential or real effects – as the risk controversies on gentechology and climate change show. Such outer-lab risk controversies dispute the authority and power of the scientific voice. They multiply educators of risks (lay people, NGOs, self-helping organizations, single issue movements, etc. cf. Beck, 2000; Doubleday, 2007; Renn, 2007a).^v The things themselves become prominent educators of risk and risk practices, if we consider risk objects as things that refer to societal controversies. These risk objects make up 'matters of concern', questioning an understanding of objects as mere 'matters of fact' (Latour, 2005).

One way of dealing with the mediation of rhizomatic risks is to produce cartographies of risk ontologies *in the making*. These cartographies try to trace the multiplicity of societal controversies of specific risk issues in contemporary societies. This may contribute and connect to standard models of risk communication and mathematical risk modelling. It may help 1) to outline a middle-range perspective to map the controversies of world risk society, and 2) to show how public risk disputes make up the realities of our present future and future present. These public risk discourses also provide the possibility of *education in the making* that gains a publicly contested form beyond the classical institutional framing of schools and colleges where education is traditionally taught.

Education has to open itself to the diversity of public forms of self-education in order to adequately deal with the education of risks and risk effects.

To do so, it seems important to pick up the differentiation between intermediaries and mediators as outlined above in order to classify risks. Intermediaries may refer to low-risk operators (low-risk actor-networks) which 'transport[s] meaning or force without transformation', whereas mediators name high-risk operators (high-risk actor-networks) that 'transform, translate, distort, and modify the meaning or the elements they are supposed to carry' (Latour, 2005, p39ff). Obviously, the differentiation between low- and high-risk operators depends on the ability to mediate risks into calculable risks or as non-calculable risks, which is one of the crucial objectives of education in world risk society. As we have seen above, money may function perfectly well as an intermediary when it is intermediating between labour and possible goods. It may also turn into a high-risk mediator when it becomes scarce. Nanotechnologies may function well as low-risk intermediaries when the relevant nanoparticles are well bound within safe structural limits. They may turn into high-risk actor-networks when they freely travel and circulate rhizomatically and uncontrollably, posing the risk of harming boundaries of life systems that secure human well-being.

Publicly accessible and assessable forms of education may add a clear understanding of what makes low risks turn into high risks. It may also give possible ways of addressing ways of dealing with high risks that escape present forms of institutional answers to risk scenarios. It may feed into an interactively conceived, practice-oriented account of education that focuses on risks *in the making*. It refers to late modern matters of concerns that mediate the vague ontology of risk and risk effects by public (often contradictory) discourse. Educational practice that is able to address risk maps may put effort in tracing risks. Acknowledging the *rhizomatic* characteristics of high risks (risk as map, high risk), education may play a crucial part to enunciate pre-cautionary principles and practices to avoid adverse risk effects (risk as trace, low risk). It may give advice to implementing specific modes of action that try to cope better with scenarios of high risks. This may also help increase the possibility of preventing low risks becoming high risks. Education that is part of producing and dealing with public dissent may provoke forms of *education in the making* that enable diverse modes of *self-education* under conditions of high risks and uncertainties.

VII. The SARS Case – Networks and Self-Education

In this last section, I briefly discuss the case of a high risk called SARS (Severe and Acute Respiratory Syndrome). It not only brings to the fore the importance of the risks as a matter of mediation but shows how such a high risk affected the type of education outlined throughout the text: self-education.

During late 2002, in the province of Guangdong, South-China, the first cases of an atypical respiratory disease appeared that later became known as SARS. At that stage, the challenge of SARS was its unknown causes, unknown future evolution and its unknown effects on human bodies. Nevertheless, SARS was considered to be a highly infectious and life threatening disease. What made SARS a global danger was its migration and diffusion along the international routes of commercial air traffic (Lovejoy, 1993). Just as air traffic speeds up people's access to highly distant places it may also hasten and broaden the transmission of such an infectious disease. As blind passengers travelling with transcontinental travellers the risk increased that SARS will develop from a regional epidemic into a global pandemic threat. And indeed, SARS proved to be highly dangerous: it was able to endanger and end individual lives and disrupted societal organization across continents (Schillmeier, 2008a; Schillmeier and Pohler, 2006). It turned private life into a public concern and *vice versa*. The duality of a virtual risk (to become pandemic) and a virulent risk (infectious disease without being known) was thought to become a global threat. Bodies that were moving between continents became

risk-bodies undermining the very functionality of globalizing networks that had enabled the successful performance of global mobility in the first place. In effect, the migration of SARS initiated transcontinental global responsibilities of enacted (world-)risk communities that tried to contain the disease. Global cities became *centers of mediating* the migration of SARS (Ali and Keil, 2006; Murphy, 2006; Roloff, 2007).

Within the first months of the outbreak, the life-threatening infectious disease remained as much mysterious as dangerous. The longer one did not know what the disease was all about, the more one was exacerbating the risk of the disease becoming a deadly hazard. The combination of unspecified bodily appearance ('Asian') with unspecified physiological reactions (coughing, high temperature, etc) turned into social/cultural ma(r)kers of high risk. In turn, these markers affected others and framed socio-cultural differences, producing social marginalization, personal exclusion and politically legalized oppression (quarantine) (CBC NEWS: Indepth: SARS). In big cities it was unspecified bodily appearance and bodies with flu-like symptoms that disrupted the practices of civil inattention so important for the performance of social normalcy, as Erwin Goffman (1963) showed so convincingly.

It was the anticipation of SARS becoming a globally spread infectious disease that necessitated the societal translation of local into global and global into local responsibility and action. SARS escaped, and in consequence, questioned for a considerable period of time the calculus of established and routinized personal and social risk practices. Paradoxically, but typically for high risks, they not only affect associated, heterogeneous networks and a wide public but question the very institutional settings that are thought to control and rule out risks. SARS showed how practices of risk containment (eg medical practices) turned into practices that produced and distributed the risk of becoming infected.

The risk of a worldwide spread of SARS was strongly linked (a) to the 'unprecedented nature of SARS, and the limited knowledge about it in both the public and clinical communities in the earliest days of the epidemic' (Murphy, 2006) and (b) to the different local habits and possibilities of clinical and isolation facilities and infection control (Groneberg et al, 2003; Peng et al, 2003). It was the spread within health care settings and by health care professionals (eg through the use of nebulizers for bronchodilators, being in close contact with patients or infected health care workers, travelling infected health care workers that acted without knowing as super-spreaders) (*cf.* Naylor, 2003).

From a global perspective (WHO), developing countries were missing standardized and universalized infection control practice, which, according to the WHO, was provoking an increased risk of global transmission. Through SARS, the WHO gained authoritative and regulative power within national and local contexts. The SARS outbreak in Asia led to a series of local control mechanisms and practices that were compliant with global standardized infection precautions and norms (SARS Watch Org). However, it also brought about the emergence of self-educated, local techniques and technologies that did not fit universalized practice but did function locally and strengthened the networks set up against a wider migration of SARS.

As a high-risk actor-network, SARS was able to enforce global regimes of life-threatening *uncertainties* that, precisely for being not known, demanded local, regional, national and transcontinental societal action. It enacted self-educated practices that nevertheless had to include others: the local perspective and practice was acting against the background of a global threat, the global perspectives had to focus most prominently on local practices. The SARS outbreak not only harmed (trans-)national economies, but made politicians, scientists and legal systems act, communicate, reflect upon and rethink their own practices and frameworks of action by re-configuring local, national and global scales of policy. One can say that the high-risk of a SARS pandemic enacted modes of self-education that made local, regional, national and trans-national organisations and

institutions associate in order to develop possible successful ways of dealing and containing the pandemic risk.

SARS being a cross-border phenomenon enacted cross-border reactions. In effect, local, regional and national scientific and medical institutions were forced to extend themselves and to leave their common cartographic and ideological space (eg local, regional or national frames of reference) in order to establish global virtual networks. Local laboratories became issue-specific, connected via the world wide web with other laboratories, organizations and institutions.

The specificities of local expertise, specialization and techno-scientifically mediated know-how were linked with transcontinental, e-based technologies. The mediation of local and virtual space proved to be a central public and professional platform to tackle the risk of SARS that was thought to spread globally and in a very short period of time. Those novel and global networks, net sources, e-articles, e-news, web blogs, SARS information sites, etc, traced the complex mapping of SARS. It allowed for interacting at a distance on a day-to-day basis, which proved to be vital in the case of a rapidly spreading infectious disease. It has been precisely the *virtuality* that defined the reality of SARS that enacted the complexities of related global practices, which in the case of SARS were quite a remarkable achievement of day-by-day virtual collaborations and networks of laboratories coordinated by WHO, including biomedical laboratories for expediting identification of the SARS causative agent, collaborative groups on epidemiology, clinical groups, medical journals reports online etc. (Ali, 2003). The virtual, global network to identify the SARS causative agent used

a secure website to post electron microscopic pictures of candidate viruses, sequences of genetic material for virus identification and characterization, descriptions of experiments, and results. The well-guarded secret techniques that give each laboratory its competitive edge have been immediately and openly shared with others. Laboratories also quickly exchange various samples from patients and post-mortem tissues. These arrangements have allowed the analysis of samples from the same patient simultaneously in several laboratories specialized in different approaches, with the results shared in real-time. This collaboration has resulted in the identification of the suspected causative agent, and the development of three diagnostic tests, with unprecedented speed (WHO Epidemic and Pandemic Alert and Response, SARS – multi-country outbreak – Update 27, 11 April 2003, page 8).

During the hot phase of the SARS outbreak human practices of self-education were organized precisely around *not knowing* what it is, why and how it acts as it does. The virtual risk of a highly mobile undefined 'something' that was thought to become a global threat made us act! It provoked virtual, e-ways of self-education that was trying to deal with the uncertain. It has been precisely the high-risk of a possible SARS pandemic which altered common scientific practices. It unravelled a process of self-education against the background of a global threat: resources were mobilized and shared, and insights were collectively exchanged *before* being published; networks of laboratories were founded and funded, new forms of diagnoses established and performed, etc. This was a first step into banning a pandemic risk from turning into a global catastrophe.^{vi} By following SARS around the globe (cf. SARS Watch ORG) a network of self-education was able to emerge that has been dealing most effectively with a situation of emergency. So much so that the mediation of local, regional, national and global efforts was successful in containing the 'microbial traffic' (Mayer, 2000) of SARS; SARS remained a global *risk* and did not develop into a pandemic with catastrophic effects.

Such newly self-educated and assembled 'extitutions', as Michel Serres (2004) calls them, visualize what institutions make invisible: the movement and relation from the local to the global and the materialized practices (virtual or not) this involves. Extitutions make things public. Extitutions differ from institutions in the ways publicity is performed. Extitutions use and refine the public space they perform. Public spaces then are always spaces of and for self-education. What became vital to stop the SARS outbreak was the *network* character of the SARS outbreak. Luckily, the risk map of SARS became traceable precisely since the relevant actors took the risk of self-education. In a considerably short period of time one was able to trace the lines of infection back to the very first possible infection and to feed this cartographic knowledge of the SARS migration back into the complex scientific definitional mapping of the specific SARS characteristics. Through the collective effort of trans-national networks, the risk of a SARS pandemic was effectively contained.

Summing up: The trans-continental migration of the SARS virus is a prominent example of how risks are mediated and how this may affect new modes of (self-)education. It gave evidence 1) of a rhizomatic high-risk actor-network and 2) of self-educated scientific practices that were able to tame the *rhizomatic map* of SARS by *tracing* the network-character of SARS. We were facing a rhizomatic high-risk that, by linking heterogeneous, non-affiliated entities (eg a non-human virus with human organisms, infected bodies with air traffic, people from all over the world unknown to each other, etc.), not only has been re-configuring human and societal order but provoked instant forms of self-education that has been mediating new forms of extitutional practices, opening the black boxes of institutionalized and territorially contained (local, regional, national) practices.

Conclusion

All the risks mentioned (ie financial, terrorist, ecological, techno-scientific and health risks) can be considered rhizomatic. SARS was described as a lucid example of such high risks. What makes high-risks like SARS so powerful is the very ability to disrupt, question and alter human societal affairs and their individual, local, regional, national and transnational organization. Like the financial crisis, the discourse of climate change, techno-scientific innovation, terrorism, etc., SARS has shown what it means to become a high risk-actor-network, ie (inter-)mediator of the risk to endanger human societal reality and related institutionalized forms of ordered action. At the same, the ways of handling such a risk also disrupted, questioned and altered human organization. In effect, it enacted the possibility of self-education that introduced the new, ie innovation and creativity.

High-risks mediate bad *and* good effects; this undecidable ambiguity articulates their reality. High risks will be a challenge for a middle range future of risk studies and are most important for conceiving educational efforts. As suggested above, contemporary institutions of education can be considered as centres of mediation that deal precisely with a comprehensive understanding of low and high risks. Nevertheless, it seems more than necessary to focus on the very processes of mediation involved in order to prepare ourselves for a life within world risk society that offers a myriad of risky chances – like the possibility of self-education that transgresses the routinized and institutionalized boundaries of social practices. Education may play a crucial part in turning risks into chances. However, as centres of mediation themselves, institutions of education have to have publicly accessible 'plug-ins', critically reflecting upon their own modes of mediation. Institutions of education may become centres of risk awareness and may also provide practical ways to adequately deal with the mediation of risks by acknowledging that education mediates practices of knowledge against the background of non-knowledge, ignorance, unawareness and related practices of self-manufactured uncertainties.

Such insights ask for a new (educational) ethos that primarily is concerned with the undecidability of how 'the social' is to be understood. The social, so my argument goes, is stabilized and constantly put at risk through the processes of mediation. This should be a main objective for institutions of education when dealing with all kinds of human societal life. Hence, the idea of mediation offers the possibility for 1) systematic research and education concerning the becoming of controversial, ambivalent and ambiguous high-risk issues, and 2) to deal systematically with their potential effects. It provides the chance to address the future multiplicity of contemporary societal change within educational practices. One major goal of education should be that issues of mediation have to become not only institutional but extititutional affairs, ie public, open sources and goods. Education, then, can be part of publicly interacting mediators that are able to outline cartographies of risks (Engel and Erlemann, 2007). The latter may offer the possibility of mapping the complexity of rhizomatic risks and make them individually traceable. In such a reading, educating risk becomes a trans-disciplinary and trans-local research activity of converging disciplines mediating the conditions of the possibility of emerging risks and their effects. Moreover, it may also mediate risk research into pragmatic accounts of risk practices and may help to give credibility and trustworthiness to practices that have to deal with the uncertainties and risks of a world risk society.

ⁱ On the effects of cutting a network, see Strathern (1995).

ⁱⁱ Obviously, Beck's list is not exhaustive: techno-scientific risks as well as health risks are most important.

ⁱⁱⁱ Not to forget that the agency of risk and risk effects are often mediated by emotions and bodily effects. Through the (medial, inter-personal etc.) experience, perception and communication of risks and risk effects, humans become affected (bodily and mentally) by risks and risk effects. These dynamics of affectual mediation constitute new forms of social organization and practices (NGOs, transnational politics, global solidarities with the Other who is suffering from risks and risk effects, planetary ethics).

^{iv} Referring to Gabriel Tarde's work, Bruno Latour (2002) proposes a shift from a traditional philosophy of being toward a philosophy of having. And indeed, a pragmatic philosophy of risk as mediation is nothing but putting at risk 'being' and turns toward the risks and uncertainties of having instead. Education, in my reading, may be a central to makes us aware of that and of offering possibilities to cope with it.

^v At the same time, the diffusion of techno-scientific innovation (genetics, biotechnologies, nanotechnologies, etc.) enforces the dependencies on scientific practices (Beck, 2007; Schillmeier, 2008c). The undecidability between the challenge and the enforcement, the chances and risks of scientific practice distributed on a global scale by circulating risk-actor-networks make 'world risk society' visible and durable.

^{vi} SARS networks were not entirely new inasmuch as they could benefit from the existence and experiences of an influenza network.

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