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ORGANIZING RISK:

ORGANIZATION AND MANAGEMENT THEORY FOR THE RISK SOCIETY

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Abstract

Risk has become a crucial part of organizing, affecting a wide range of organizations in all sectors. We identify, review and integrate diverse literatures relevant to organizing risk, building on an existing framework that describes how risk is organized in three 'modes' – prospectively, in real-time, and retrospectively. We then identify three critical issues in the existing literature: its fragmented nature; its neglect of the tensions associated with each of the modes; and its tendency to assume that the meaning of an object in relation to risk is singular and stable. We provide a series of new insights with regard to each of these issues. First, we develop the concept of a risk cycle that shows how organizations engage with all three modes and transition between them over time. Second, we explain why the tensions have been largely ignored and show how studies using a risk work perspective can provide further insights into them. Third, we develop the concept of risk translation to highlight the ways in the meanings of risks can be transformed and to identify the political consequences of such translations. We conclude the paper with a research agenda to elaborate these insights and ideas further.

INTRODUCTION: THE ORGANIZING OF RISK

If a reminder was needed, the COVID-19 pandemic has shown yet again, that risk is a prominent feature of contemporary organizing: organizations bear risks, their activities produce risks, and they are increasingly regulated by other organizations in attempts to avoid or contain risks (Czarniawska, 2009; Power, 2007; Scheytt et al., 2006). The concept of risk has become a powerful organizing logic (Power, 2004) as organizations have become "centres for processing and handling risk" (Hutter & Power, 2005: 1). We now live in a 'risk society' (Beck, 1992) that is increasingly preoccupied with "debating, preventing and managing risks that it itself has produced" (Beck, 2006: 332). Accordingly, organizations are as concerned with producing and bearing risks as they are with wealth creation (Tsoukas, 1999). It is, therefore, important that, as organizational scholars, we understand the ways in which risk and organizing are tightly bound up with each other.

The concept of risk has a long history, but its rise is strongly associated with early modernity (Beck, 1992; Giddens, 1999a, 1999b), when science and rationality, rather than religion, were brought to bear on intellectual and philosophical thought. The "mastery of risk" put paid to the notion that the future was merely "a whim of the gods" (Bernstein, 1996: 1). Risks could be 'good' or 'bad' (Lupton, 2013a; O'Malley, 2004). For example, with its early use in marine insurance, risk was associated with the chances of a ship returning safely and making its owner's fortune against the chances of it being lost at sea and bringing ruin (Douglas, 1992). By understanding the risks, organizations could decide the best action to take in order to exploit them, avoid them or insure against them. While it was desirable to avoid adverse outcomes when possible, it was often worth risking them in order to secure the associated rewards and returns (e.g., Jarzabkowski, Bednarek & Spee, 2015; Nowotny, Scott & Gibbons, 2001). Accordingly, many organizations engaged in risk-taking to obtain higher financial or entrepreneurial gains (Lupton, 2013a; McMullen & Shepherd, 2006). "By showing the world how to understand risk, measure it, and weigh its consequences … risk-taking [was turned] into one of the prime catalysts that drives modern Western society" (Bernstein 1996: 1).

Over time, the concept of risk travelled and expanded from economic and financial spheres to permeate other domains (Power, 2014), such as medicine, engineering, environmental studies, health and safety, and psychology (Scott & Walsham, 2005). In doing so, it became associated with more negative connotations. Instead of a focus on organizations which took risks and managed them (more or less) to their advantage, attention turned to organizations which produced risks borne by others – especially global, manufactured risks created by the "progression of human development" (Giddens, 1999b: 4). As a result, risk came to be seen as: "a threat, hazard, danger or some form of harm" (Gephart,Van Maanen & Oberlechner, 2009: 141), "the possibility of an unfortunate occurrence" (Society for Risk Analysis, 2018), the "anticipation of catastrophe" (Beck, 2006: 332), a "situation in which something of value (human well-being, property, or morals or beliefs) is threatened" (Beamish, 2019: 88), or "the chance of mishap" (Cranor, 2007: 38).

Whether associated with financial gain or some form of catastrophe, organizations sought to calculate risks – typically in statistical terms as the probability of an event multiplied by the magnitude of losses or gains associated with the event – so that appropriate actions could be taken. The aim of calculating risks was, then, to ascertain exactly what they were, how likely they were to arise, and what their effects would be if they did. The calculation of risk, as a result, became ever more 'scientized' with the proliferation of techniques and methodologies to assess and manage risk (Power, 2004). It is these techniques that differentiated risk from uncertainty: in the former, the probability of an event occurring is known; in the latter, it cannot be specified, making it far more difficult for organizations to take decisions to deal with it (Knight, 1921).

This clear distinction between risk and uncertainty no longer holds true – the concept of risk has changed "from one of probability to one of radical uncertainty" (Willms & Beck, 2004: 31; see also King & Kay, 2020).The global, manufactured risks produced in contemporary society are not only associated with negative outcomes, they are also novel, unfamiliar and involve considerable uncertainty "We often don't really know what the risks are, let alone how to calculate them accurately in terms of probability tables" (Giddens, 1999b: 4). Characterized by complex

causalities, global impacts, long lead times and catastrophic consequences (e.g., Arnoldi, 2009; Aven & Renn, 2009; Beck, 2006; Hardy & Maguire, 2019; Mazri, 2017), these risks are not amenable to current scientific techniques (Vlek, 2010). In fact, instead of science creating certainty as was once "triumphantly presumed," it now "generates even more uncertainty" (Tsoukas, 1999: 505). Seemingly simple questions as to whether a risk exists or not cannot easily be answered (Borraz, Gilbert & Joly, 2007; van Asselt & Vos, 2008). Accordingly, we define risk as "a phenomenon that has the potential to deliver substantial harm, whether or not the probability of this harm eventuating is estimable" (Lupton, 2013a: 10).

The confidence that the concept of risk once engendered through its ability to render uncertain, potentially hazardous futures into 'knowable' risks (Elliott, 2002; Binkley, 2009) has broken down, with the result that risks are "less readily identifiable, more problematic, less easily managed, and more anxiety-provoking" (Gephart, et al., 2009: 142). Accordingly, organizations are increasingly preoccupied with risks but, paradoxically, less able to manage them (Holt, 2004; Tsoukas, 1999). "The irony of risk here is that rationality, that is, the experience of the past, encourages anticipation of the wrong kind of risk, the one we believe we can calculate and control, whereas the disaster arises from what we do not know and cannot calculate" (Beck, 2006: 330). In studying risk, then, we can no longer limit ourselves to the study of the techniques used to calculate risks. Instead, we must examine how risk is *organized* (e.g., Hardy & Maguire, 2016; Power, 2004; Short & Clarke, 1992), by which we refer to the systems created, the procedures employed, and the accountability relationships that are enacted in and among organizations in order to deal with phenomena that are considered to have the potential to deliver substantial harm. As we will show in this article, organizing risk involves far more than calculating them before they arise; it also means containing risks that do arise and reflecting on how to improve how they are organized in the future.

The paper is organized as follows. In the next section, we explain how we identified the literature for our review. We then present our literature review in two parts. In the first, we focus on the diverse literatures that provide insights into what organizations do when they organize risk. We

identify three different 'modes' through which risk is organized – prospective, real-time and retrospective – which we characterize as a risk cycle. In each mode, we identify a potential tension between two sets of practices, whose implications we later explore. The second part of the literature review presents three important perspectives that researchers use when they examine risk from an organizational standpoint – risk culture, risk work and risk translation. We show how the three perspectives potentially cut across the three modes of organizing risk and, as such, provide an important resource for our subsequent insights. From this review of the literature, we identify three critical issues. The first concerns the tendency of the risk literature to focus on a single mode even though situations may require organizations to engage with multiple modes. Accordingly, we present a series of new insights into the concept of a risk cycle and discuss how organizations transition from one mode to another. The second critical issue concerns the tensions that characterize each of the three modes – although the existing literature acknowledges that such tensions exist, it offers little understanding of how organizations deal with them. Accordingly, we explore how the risk-culture and risk-work perspectives shed light on these tensions and stress the benefits from adopting risk work as an analytical framework for inquiry. The third critical issue concerns how risk translations not only change the meaning of objects in relation to risk, but also transform power relations among actors. Accordingly, we present a series of new insights to help researchers understand the way in which organizing risk is situated in a larger socio-political context. We conclude the article by offering suggestions for future research.

METHODOLOGY

Literature reviews vary significantly in terms of how they are carried out and what they are intended to achieve (Cooper, 1988). Our purpose is to review literature relevant to organizing risk in order to develop insights and suggest promising research directions that will increase the relevance of organization and management theory (OMT) to the contemporary risk society. Accordingly, our review can be described as 'integrative' – it "reviews, critiques, and synthesizes

representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated" (Torraco, 2016: 404). Such reviews are conducted critically and organized thematically with a view to reconceptualizing existing ideas and providing a catalyst for future research (Snyder, 2019). For a somewhat similar approach, see Amis, Mair & Munir (2020). Two notable features of our literature review are, therefore, the following.

First, our integrative review sought to elaborate and enhance a framework developed in earlier work (Hardy & Maguire, 2016). Accordingly, as we were reading the material, we were also synthesizing themes and identifying particular issues related to this framework that we wanted to pursue. We therefore conducted selective, purposeful searching (Grant & Booth, 2009) in order to track down particular publications that promised to add to our understanding by filling in gaps and/or contributing ideas for interesting new avenues of research. Second, 'organizing risk' is not a concept that lends itself to comprehensive database searches. It is not a common search term and relevant articles appear in a wide range of specialist journals outside OMT. These articles are difficult to identify through systematic searches, especially given the large number of highly technical articles that are not relevant, but which result from searches using 'risk' together with organizational search terms.

Recognizing that organizations are increasingly preoccupied with risks that are not necessarily amenable to calculation and being aware that the majority of the literature on risk is highly technical, our objective is to provide insight into how risks are organized. We therefore started with a comprehensive database search to identify articles with 'risk' in nine leading OMT journals – *Academy of Management Annals*, *Academy of Management Review*, *Academy of Management Journal*, *Administrative Science Quarterly*, *Journal of Management Studies*, *Organization*, *Organization Science*, *Organization Studies*, and *Strategic Management Journal* for the last twenty years. Three reasons underlie the selection of the journals chosen: they are held in high esteem in relevant journal rankings (Laing et al., 2015); they have been used in other Annals articles (e.g., Hällgren et al., 2018); and they include both US and European journals. The search

yielded returned 120 articles. However, the vast majority had to be excluded because they did not address the *organizing* of risk but, instead, covered a range of technical topics such as risk tolerance, risk preferences, risk-taking, risk-return relationships, risk-return paradox, political risk, acquisition risk, climate risk, and so forth. While the remaining 18 articles proved helpful, it was clear to us that numbers were insufficient to achieve our objective.

We therefore decided to target research in other journals that might also inform the three modes for organizing risk identified in Hardy and Maguire's (2016) framework, although this search proved equally unproductive. For example, in relation to the prospective mode, we searched for articles on 'risk and 'organization' or 'organizational' in their titles and published in leading risk journals – *Risk Analysis* and *Risk Management* yielded 33 hits, but a review of abstracts revealed that the vast majority of these articles were highly technical, as a result of which 32 were discarded because they provided no insight into organizing risk. A similar search of *Journal of Contingencies and Crisis Management* and *Disaster Prevention and Management* to identify material relevant to the real-time mode proved equally fruitless – we identified 76 articles, which we discarded as not being relevant. Finally, a search of *Safety Science* and *Journal of Safety Research* to identify papers related to the retrospective mode and addressing organizational reviews resulted in 57 hits but, again, we discarded them all because they did not directly address the organizing of risk.

Given the limited success of these database searches, we decided to employ a more selective, purposive search. An evolving search strategy is often required with integrative reviews in order to follow up various leads and shifts in thinking (Bates, 1989). Consequently, we employed what is known as forward and backward 'chaining' i.e., following up on promising references found in the bibliographies of material identified through comprehensive searching, as well as following citations forward to other work that cited it (Ellis, 1989). In this way, we were able to identify work that looked promising in terms of adding to our understanding of how risk is organized. This targeted searching alerted us to valuable material in diverse journals, books and chapters that would not have been identified by more standardized searches, but which contributed greatly to our

review. Through this combination of searches, we identified the articles, books and chapters listed in Table A in the Appendix which form the basis our review of the three modes of organizing risk.

As a result of our searching, it became increasingly clear – as we had suspected – that much of the material tended to be siloed, dealing with only a single mode (cf. Amis et al., 2020). This led us to develop a second objective: to provide a holistic understanding of how risk is organized in order to provide a firmer basis for new insights and future research. Accordingly, we conducted a second search phase – to identify work that had the potential to cut across more than one mode. Three particular perspectives appeared to offer the most promise: studies of risk culture, high reliability/resilient organizations, risk translation. We conducted standardized searches of these terms in the nine OMT journals, which identified few papers for our purposes. We therefore followed up on specific references and customized searches to identify the articles, books and book chapters listed in Table B in the Appendix.

A REVIEW OF THE LITERATURE ON ORGANIZING RISK

The study of risk does not constitute a "tightly unified and consensual field but instead consists of many distinct subdisciplines and specialisms, rather like the islands of an archipelago" (Hood & Jones, 1996: 3). As a result, there is a considerable amount of research that does not always engage explicitly with the terminology of risk but, nonetheless, can contribute greatly to our understanding of how it is organized (Hardy & Maguire, 2016; Power, 2014). We present our review of the literature in two parts – on different modes and on different perspectives.

Modes for Organizing Risk

In this section, we review different bodies of research which suggest that risk is organized in three modes – prospectively, in real-time and retrospectively.

Organizing Risks Prospectively

The prospective mode for organizing risk refers to how organizations identify risks that may materialize in the future in order to prepare for them. The most familiar body of work is that of

formal risk analysis where scientific techniques are used to identify and measure risks so that organizations can manage them. However, in order to understand how particular risks are singled out for some kind of intervention, whereas others are not, we must also consider the work on risk perception and risk controversies. We also discuss research on the discourse of risk, which provides an alternative approach by showing how risks are identified through processes of social construction. Finally, we identify an important tension between two sets of practices used to organize risk prospectively.

The scientific discipline of risk analysis is a community of practice (Whittaker, 2015) with its own professional association (the Society for Risk Analysis), specialized journals, and thousands of scientists from different disciplines working to create standardized approaches to identify and manage risk. Originally driven by regulatory organizations (Demortain, 2020), it has since been taken up by organizations in a wide range of sectors to "evaluate process, product, or site remediation safety, prioritize risk reduction measures, or demonstrate regulatory compliance (or lack thereof)" (Whittaker, 2015: 2131). It operates on the basis that risk is an objective phenomenon which, having been identified, can be represented in quantitative terms and then managed. In this way, risk is 'normalized' i.e., by being measured and predicted through the application of normal science, and then limited to tolerable levels such that risk becomes accepted and taken-for-granted (Maguire & Hardy, 2013).

Risk analysis comprises three interrelated components: risk assessment; risk management and risk communication (Fjeld, Eisenberg & Compton, 2007). Risk assessment is a systematic, quantitative process for identifying "risk sources, threats, hazards and opportunities" and determining their significance "using relevant criteria" (Society for Risk Analysis, 2018: 4). It provides a rational, formal basis for calculating exposure to risk when organizations are faced with the possibility of adverse events in the future. It conceptualizes exposure in probabilistic terms, drawing on actuarial science, statistics and hypothesis testing, as well as computer models for forecasting and scenario analyses (Miller, 2009). In the finance and insurance industries, the

'mathematizing' of risk (MacKenzie, 2005; Mikes, 2009; 2011) is undertaken with an objective of maximizing financial gains for a given level of risk (Millo & MacKenzie, 2009). In this case, the risk bearer is also the beneficiary, as with an investor who bears the risk should asset prices fall and reaps the rewards if they rise. In other settings, the organization may benefit economically from producing risks, while individuals – employees, consumers and members of the community – bear them. In this case, risk regulators typically intervene – engaging in risk analysis in order to identify the risk and decide on appropriate ways to manage it (Fjeld et al., 2007).

Risk management follows once the risk has been assessed. It is concerned with "exploring opportunities on the one hand, and avoiding losses, accidents and disasters on the other" in order to achieve "the proper risk level" (Society for Risk Analysis, 2018: 5). Whereas risk assessment is portrayed as the objective, scientific and fact-based component of risk analysis, risk management involves the use of value judgments. In simple terms, risk assessors ask: 'how risky is this situation?' Risk managers then ask: 'how much risk are we willing to accept?' and 'what shall we do about it?' (van Leeuwen & Vermeire, 2007). Risk management thus involves weighing alternative courses of action and selecting the most appropriate one by balancing the risk with "social, economic, and political concerns" (NAS–NRC, 1983: 18) or with the risk 'tolerance' or 'appetite' of the organization (Bromiley et al., 2015; Power, 2009). For example, the United Nations Convention on Persistent Organic Pollutants banned the use of a range of toxic chemicals but only restricted the use of the insecticide DDT because its benefits in reducing risks to human health (by combatting malaria) were considered to outweigh the risks it posed to the environment (Hardy & Maguire, 2010).

Risk communication is carried out to ensure that "important issues are identified for analysis and to facilitate stakeholder understanding of the risk management decisions" (Fjeld et al., 2007: 3). It helps regulators and organizations involve stakeholders in identifying, preventing and managing risks (Leiss, 1996), as in major infrastructure developments posing health and/or environmental risks such as the Keystone Pipeline or the expansion of London Heathrow Airport. It may also be

used to persuade stakeholders to modify their attitudes or behaviour to avoid risks or manage them differently, as with campaigns on the risks of smoking or drink-driving (Lundgren & McMakin, 2018). Risk communication is often informed by research on risk perception, which tries to explain why individuals have different perceptions of the likelihood and magnitude of a specific risk (Slovic 2016) and, particularly, why 'laypeople' have the 'wrong' perception (Jasanoff, 1998). Accordingly, this literature tends to contrast "the objective facts identified by experts with subjective understandings of lay people who are subject to bias" (Gephart et al., 2009: 143). For example, risks whose hazards are difficult to observe, as with risks from exposure to chemicals in everyday consumer products, are often understated, whereas 'dread' risks, such as the risk of aircraft crashes, tend to be overstated (Jagiello & Hills, 2018). Another area of interest in this literature has been the denial of risk as a psychological process (e.g., Sjöberg, 2006).

Another body of research that examines how risks are identified and acted upon focuses on risk controversies, where stakeholders have conflicting views of the risk and the values deemed to be 'at risk' (Boholm & Corvellec, 2011; Huault & Rainelli-Weiss, 2011). The causes of such controversies are manifold. Experts may disagree due to difficulties in quantifying the risk or because ambiguous data leads to divergent interpretations (Borraz, 2007; van Asselt & Vos, 2008). Even if technical experts produce convergent assessments, the public may disagree with them (Beamish, 2001; Leiss, 2001). Accordingly, this literature highlights the difficulties of assessing risks whose "very definition is the subject of debates," and which "lend themselves to phenomena of publicization and politicization" (Borraz, Gilbert & Joly, 2007: 989). Accordingly, there are studies of struggles among different groups over risks as diverse as those associated with the use of coal-fired power generating stations, the location of hazardous waste facilities and the development of salmon aquaculture (Jardine, Predy & Mackenzie, 2007; Renn & Schweizer, 2009; Young & Liston, 2010).

The literature above tends to take a realist approach (Jasanoff, 1998; Zinn, 2008) where a pre-existing risk is 'discovered,' albeit that organizations may not always agree about its existence,

magnitude or implications. The realist approach assumes that the existence of a risk "can be determined, accurately and objectively, through the application of scientific knowledge derived from the past in highly institutionalized ways, such as the employment of scientific measurement and analytical reasoning, and the application of specific, widely accepted risk analysis and measurement techniques" (Hardy & Maguire, 2016: 84). Risks are seen as objective features of reality that can be ascertained through analysis, on the basis of which organizations decide whether and how to act on particular objects in order to avoid or reduce unwanted, adverse consequences.

An alternative approach, informed by work in sociology, examines how risks are 'constructed', (e.g., Beck, 2006; Clarke & Short, 1993; Douglas, 1992; Douglas & Wildavsky, 1982; Lupton, 2013a; Power, 2004; 2007). This body of work focuses on how *meanings* in relation to risk are attached to particular objects through organizing processes (Maguire & Hardy, 2013). In other words, not everything that could be seen as a risk becomes recognized and represented as one (Douglas & Wildavsky, 1982). Only certain entities, activities and individuals are constructed as 'risk objects,' which occurs through a rhetorical process that identifies "an object deemed to 'pose' the risk, a putative harm, and a linkage alleging some form of causation between the object and the harm" (Hilgartner, 1992: 40). Accordingly, risks are constructed through "processes of negotiation and conflict resolution in settings ranging from the relatively closed quarters of a research laboratory to the public debate of a regulatory hearing" (Jasanoff, 1998: 94), as well as through "complex and necessarily incomplete processes of organizational attention involving information systems, incentive structures and narratives of explanation" (Scheytt et al., 2006: 1333). Accordingly, research has examined processes of constructing risks (e.g. Palermo, Power & Ashby, 2017; Malenfant, 2009; Wissman-Weber & Levy, 2018; Nyberg & Wright, 2017), as well as the role played by narratives therein (e.g., Corvellec, 2011; Mairal, 2008).

Some studies take an explicitly discursive approach (see Phillips & Oswick, 2012) by drawing on the work of Foucault (1980; 1991) to examine how these meanings are created and attached to objects within a dominant discourse of risk (e.g., Hardy & Maguire, 2016; Maguire &

Hardy, 2013). A discourse is "a bounded body of knowledge and associated practices, a particular identifiable way of giving meaning to reality via words or imagery. Through discourses we perceive and understand the social, cultural and material worlds in which we move. Discourses both delimit and make possible what can be said and done about phenomena such as risk" (Lupton, 2013a: 23). This approach does not deny the importance of quantitative techniques in prospectively organizing risk but argues that, rather than 'revealing' risks, "these techniques constitute the rhetorical means by which risk objects are constructed" (Hardy & Maguire, 2019: 5). In other words, the authoritative status of techniques for risk analysis produces "'truths' on risk that are then the basis for action" (Lupton, 2013a: 113).

The literature suggests that a tension may arise during the prospective organizing of risk between *normalizing* and *problematizing* practices. The emphasis on a realist approach has led to a predominant set of practices that involve normalizing i.e., transforming future uncertainties into knowable, calculable and manageable risks through scientific techniques (see, for example, Jarzabkowski et al., 2015). Specific practices include using prevailing scientific methods, referencing extant research and invoking established experts so that risk decisions are based on 'sound science' (Maguire & Hardy, 2006; 2013). An alternative set of practices, less commonly found, involve problematizing. These practices support a more 'precautionary approach' (Maguire & Hardy, 2006; Klinke & Renn, 2002) by questioning the ability of existing knowledge to identify risks, disputing putative 'facts' and challenging established experts as it draws attention to scientific uncertainty (Maguire & Hardy, 2013). The tension between normalizing and problematizing is significant because, while the tendency to normalize risk may help identify and measure familiar risks that are well understood, problematizing may be needed to organize novel, unfamiliar risks insofar as it enables action even when the science is uncertain.

Organizing Risks in Real-Time

No matter how sophisticated the techniques associated with the prospective organizing of risk, some risks will materialize and must therefore be organized in real-time, particularly in the

case of risk incidents such as crises and disasters. In fact, 'normal accident theory' (Perrow, 1984) argues that such incidents are a natural consequence of complex and supposedly rational organizational systems (Beamish, 2019: Dosdall & Nichelmann, 2019). Incidents like the Challenger shuttle disaster are inevitable from time to time simply because the context – space exploration – is extremely dangerous (Power, 2016a). Organizations that operate in 'risky contexts' face the "ever-present potentiality of catastrophe" and, when such contexts become disrupted or emergencies arise, risks will materialize (Hällgren et al., 2018: 125).

Accordingly, one body of literature that informs our understanding of this mode is research on crisis and disaster management (Gephart, Miller & Helgesson, 2019; Williams et al., 2017). This work often emphasizes the importance of implementing plans developed during the prospective mode and centralizing control in order to contain risks as soon as they begin to materialize (e.g., Alexander, 2005; Leveson et al., 2009; Perry & Lindell, 2003). For example, organizations may engage in stress tests, scenario planning or war-gaming (Kaplan & Mikes, 2012) during the prospective mode to find out how a risk is likely to materialize and then develop plans to deal with it in the real-time mode in the event that it does. This work also emphasizes the importance of complying with predetermined, top-down, command and control protocols to organize risks in real-time, "where successive hierarchical levels or external agencies cross-check attempts to contain the risk, monitor progress, coordinate actions, and approve changes in routines as the risk is deemed to worsen or diminish" (Hardy & Maguire, 2016: 89).

A planned, top-down approach, based on expert risk knowledge derived from past experience may, however, be inadequate to deal with the exigencies of the present (Weick, 1993). Plans only provide general guidelines regarding impending risks, which may manifest themselves in very different ways in real-time depending on the particular conditions in a specific local context (Sauer, 2003). Accordingly, risks are likely to materialize in unpredictable and unexpected ways during an incident, resulting in ambiguity and equivocality (Ash & Smallman, 2008; Macrae, 2007; Winch & Maytorena, 2009). As a result, sensemaking occurs to re-create a more sensible, ordered

environment and enable individuals to take action (Maitlis & Christianson, 2014). As individuals make plausible sense of rapidly changing conditions (Weick, Sutcliffe & Obstfeld, 2005), they may deviate from predetermined plans and protocols (Macrae, 2014; Weick, 2010; Whiteman & Cooper, 2011). In the case of the Fukushima disaster, for example, TEPCO employees were forced to improvise in order to vent the reactor without electricity because the company had no plans for doing so. Later on, it became clear to the plant manager on site that seawater would be needed to cool another reactor because fresh water was unavailable. This decision was challenged by an official at the head office in Tokyo, but the plant manager decided to proceed regardless. As a result of doing so, the individuals who stabilized the reactor at considerable risk to their personal safety – the 'Fukushima 50' – were subsequently ostracized by TEPCO and the Japanese government (Willacy, 2013).

High-profile risk incidents are not the only setting for the real-time mode – risks also have to be organized in real-time when the prospective mode has deemed that a certain level of risk is acceptable, perhaps because the risk is associated with a worthwhile return or because it is costly, impractical or even impossible to avoid the risk completely. In this case, the real-time organizing of risk involves monitoring the level of risk to ensure that it remains within prescribed standards and tolerances (Hood, Rothstein & Baldwin, 2001). This task is incorporated into many formal risk assessment frameworks, such as those produced by the Committee of Sponsoring Organizations of the Treadway Commission and the International Organization for Standardization, which provide methodologies for reporting and controlling risks once tolerable levels have been identified. In the airline industry, the level of risk is tracked in real-time through various flight data monitoring systems and the mandatory logging of any incident that occurs outside specified parameters (e.g., Palermo, 2016; Power, Ashby & Palermo, 2013). Similarly, risk mapping, risk matrices and various other forms of templates, such as 'value at risk' limits for an investment portfolio, are used in real-time to ensure that as risks materialize, levels stay within specified limits (e.g., Hall & Fernando, 2016; Jørgensen & Jordan, 2016; Mikes, 2016).

Risks can also be organized in real-time through informal practices that evolve incrementally, and which do not make reference to the language of risk or make use of prescribed risk techniques. As Corvellec (2009: 287) points out: the "absence of formal risk management and a reluctance to use a risk vocabulary … [is] not the same as an absence of risk management" because organizations may be capable of organizing risks in real-time through their ordinary managerial practices and routines. Insofar as the bulk of literature discussed so far tends to focus attention on formal mechanisms – the formal chain of command, formal decision-making processes, and formal monitoring and evaluating mechanisms – we know little about how risk is organized when the terminology of risk is not explicit and when practices are emergent rather than planned.

The literature suggests that a tension may arise during the real-time organizing of risk between *controlling* and *improvising* (Perin, 2005). The predominant set of practices used to organize risk in this mode revolves around controlling i.e., the implementation of predetermined plans and protocols based on deliberate, rehearsed action in a top-down way. In contrast, improvising practices emphasize emergent, exceptional action during incidents and the decentralization of authority and responsibility to frontline workers who are often better placed to recognize unanticipated trajectories than their superiors located further afield (Perin, 2005; Sauer, 2003). This tension is significant because, when risk incidents occur, the tendency is to centralize control in order to exercise hierarchical oversight standards (Power et al., 2013). However, if risk incidents do not follow a predicted trajectory and materialize in unpredicted or unpredictable ways, improvising may be called for. However, switching may be difficult because improvising contravenes organizational norms of hierarchy and responsibility and workers who do improvise are at risk of being blamed for not adhering to standard operating procedures (Hardy & Maguire, 2016).

Organizing Risks Retrospectively

Risk is also organized retrospectively, during which the earlier prospective and real-time organizing of risk is held up to scrutiny. The main bodies of work relevant to this mode are the literature on public inquiries into risk incidents and studies of internal safety reviews and audits.

Public inquiries typically take the form of an ad hoc, high profile committee or panel, often commissioned by governments following a major risk incident or 'near miss' ostensibly to investigate, reflect on and learn from what happened. Risk incidents provoke "both disappointment with the way risk was managed and a search for reform. These events are often spectacular and headline grabbing … They generate public enquiries, diagnoses, blame and post-disaster introspection about what went wrong and how it might have been prevented" (Power, 2016a: 2). Recent examples include the Royal Commission into the 2009 Victorian bushfires in response to Australia's most damaging natural disaster; the Financial Crisis Inquiry Commission (FCIC) set up by Congress in 2009 to examine the causes of the financial crisis in the US; and the 2017 Grenfell Tower Fire Inquiry, set up by the UK government after the death of 72 people trapped in a fire caused by unsafe cladding. Public inquiries are also held as a result of an accumulation of smaller incidents, such as problems for consumers arising from risky lending practices (e.g., the Australian Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry) and health problems for patients arising from blood transfusions (e.g., the Infected Blood Inquiry in the UK). In such cases, individual incidents may not attract much attention but, at some point, trends generate closer inspection, often as a result of media attention or political priorities.

Hilgartner (2007: 154) argues that public inquiries are an important way to persuade the public that the state can successfully deal with future risks: "authorities must address the meaning of a disaster as well as the materiality of it. Reclaiming a sense of normalcy may depend on placing the episode securely within a narrative frame that restores confidence in the capacity of social institutions, especially the state, to protect the citizenry." Similarly, Burgess (2011) argues that public inquiries are a mechanism to meet expectations that pervasive, diffuse risks can – and should – be eliminated. Accordingly, research has examined inquiries set up to investigate risk incidents as diverse as those involving train travel (Cullen, 2000), gas plants (Hopkins 2008), health care (Newdick & Danbury, 2015), terrorism (Parker & Dekker, 2008) and public events (Huber & Scheytt, 2019). It has been pointed out that establishing inquiries and generating extensive

recommendations does not allay fears about risk. On the contrary, it 'amplifies' risk (Pidgeon, Kasperson & Slovic, 2003), not only "raising the profile of particular threats, but tending to act as a permanent reminder. Far from drawing a line under experiences, risk-averse concern tends to become embedded" (Burgess, 2011: 6).

The retrospective organizing of risk also occurs less visibly, inside organizations. Safety and/or accident reviews may be mandated by regulatory and/or organizational policy (e.g., Madsen, 2009). They also follow from the reporting of 'mishaps' in the form of debriefing sessions (Catino & Patriotta, 2013), as well as 'after-action' and 'post-project' reviews designed to review safety and enhance learning (Ron, Lipshitz & Popper, 2006). Similarly, internal auditors are responsible for retrospectively organizing risk in the 'third line of defence' used in many financial organizations (e.g., Luburic, Perovic & Sekulovic, 2015). The exponential growth of auditing provides the means for 'back tracking' the circumstances related to a particular risk incident, thereby facilitating the retrospective organizing of risk (Power, 2019). Such investigations take place in settings as diverse as transport accidents, crime scenes and economic fraud (Roed-Larsen & Stoop, 2012), and revise internal management systems to improve how risks are handled (Stoop & Dekker, 2012).

Public inquiries and internal reviews involve investigations that span the 'epistemological' by establishing what happened, the 'preventive' by identifying pathways to avoidance, the 'moral' by tracing the transgressions that were committed and reinforcing moral and regulatory boundaries, and the 'existential' by finding an explanation for any suffering that occurred (cf. Dekker, 2015). Various forms of deliberation are used to produce an account of what happened, as well as to make recommendations for improving how risk is organized in the future (Hardy & Maguire, 2016). The past is reconstructed after the event by actors such as judges, experts, professionals and witnesses, only some of whom were directly involved in the incident under investigation. Public inquiries tend to rely heavily on expert knowledge (e.g., Ainsworth & Hardy, 2012; Brown, 2004; Gephart, 1993; Topal, 2009), while, in the case of internal reviews, senior managers, internal auditors and other technical experts are charged with ascertaining what happened (Dechy et al., 2012; Dekker, 2002,

2015). In this regard, risk acts as a 'forensic resource' that is used to hold persons accountable and to attribute blame (Douglas, 1990).

The main focus of the research into such investigations is their *failure* to improve practices (Boin, 2008; Dechy et al., 2012; Hayes & Maslen, 2019). Some researchers attribute this failure to the type of knowledge that is produced by reviews and inquiries i.e., an authoritative account of what happened that is assembled "by aggregating and abstracting the partial knowledge of various participants in the hearing or review into a holistic account of the past" (Hardy & Maguire, 2016: 92). This narrative is then revised and fine-tuned as it is passed among lawyers, safety experts, and technical advisors so that "the viewpoints of multiple stakeholders are literally written into the regulatory process" (Sauer, 2003: 47). However, this ex post facto knowledge – 'know-that' in Ryle's (1949) terms – is very different to 'know-how' i.e., the knowledge of those immersed in action (Dekker, 2002; Hadjimichael & Tsoukas, 2019). When carrying out their work in situated contexts, actors have only partial views of risk and know only of conditions as they unfold around them. In contrast, for investigators reviewing an incident, the outcome is known and the sequence of events leading to it is reconstructed with the outcome in mind. Therefore, hindsight "does not equal foresight. Investigations that are anchored to outcome knowledge run the risk of not capturing the complexities and uncertainties facing sharp end personnel and why their actions made sense at the time" (Henriksen & Kaplan, 2003: ii46).

A second reason for the failure of the retrospective mode to bring about improvements in how risk is organized is, according to some critics, because inquiries are designed first and foremost to deflect criticism of authorities and powerful business interests (Kendra, 2007; Birkland, 2009). While reports may make suggestions about how to deal with future risks, their recommendations may be more political than remedial, calling for existing systems to be maintained albeit with minor modifications (Brown, 2004; Topal, 2009). Linked to this issue is the tendency of the retrospective mode to allocate blame and avoid liability (e.g., Alves, Ometto & Guimarães, 2019; Hood, 2002; Huber & Scheytt, 2019). Since responsibility can be allocated in many different ways,

investigations serve to create new links in a sociotechnical system by producing accounts that hook "people and things together in a network of cause and blame and guilt" regarding how risk has been organized (Hilgartner, 2007: 155).

The literature suggests that a tension may arise during the retrospective mode between *blaming* and *learning*. The predominant set of practices used to organize risk in this mode revolves around blaming, including the tendency to search for single, linear causes of risk incidents and attribute risk incidents to 'human' error (Power, 2009; McArdle, Burns & Ireland, 2003; Rose, 2004). Hood (2002: 36) suggests that there is no such thing as a 'blame-free' risk – "the way risk is managed depends on the way the blame game plays out" (also see Douglas, 1992). In contrast, learning practices emphasize a wider focus on multiple, interacting causalities, acknowledging possible systemic defects in risk knowledge and allowing organization-wide participation in reporting systems (Palermo, 2016). These practices encourage individuals to admit to errors and to be willing to reflect on them, thereby "enabling the organization to identify problems and make systemic improvements to its operations" (Lupton & Warren, 2018: 41). The tension between blaming and learning is significant because the former appears to preclude the latter (Edmondson, 2018; Vince & Tahir, 2004). Fear of blame leads managers to initiate inquiries with limited scope (Elliott & McGuinness, 2002; Hutter, 1992) and reduces employees' willingness to report errors and near misses, thereby eliminating learning opportunities (McArdle et al., 2003; Waring, 2005).

Perspectives on Organizing Risk

The first part of the literature review has focused on the diverse literatures that illuminate how risk is organized in three different modes, providing insight into what organizations do when they organize risk. In the second part, we discuss three perspectives that researchers use when they examine risk from an organizational standpoint – risk culture, risk work, and risk translation. As we will show, this work not only adds to our understanding of how risk is organized, but also has the potential to cut across multiple modes. As such, it provides an important resource in developing the

insights that we present in the second half of the paper.

Organizing Risk through Risk Culture

Connections between risk and culture can be traced back to Mary Douglas's work which established cultural links between group values and collective perceptions of specific risks (Douglas, 1992; Douglas & Wildavsky, 1982). Douglas was particularly interested in increased perceptions of technological risk among members of 'radical' groups on the 'borders' of society. Her explanation was cultural in that she argued that these risks were constructed as part of symbolic struggles against mainstream communities. According to this view, risk cultures characterize communities that are "constructed in the context of institutional uncertainty of risk, and which may work to identify environmental and other risks" (Lash, 2000: 49). This collective notion of risk helped to set the scene for viewing groups as having their own, distinct risk cultures, where individuals "notice, address, and respond to particular phenomena as risks and fail to attend to other potential risks based on cultural logics and beliefs" (Gephart et al., 2009: 144).

Accordingly, recent research has focused on discrete organizations with cultures in which risk is seen as the collective responsibility of all members. One example is research on safety cultures (Barton & Sutcliffe, 2009; Hoffman & Stetzer, 1998), where "safety is understood to be, and is accepted as, the number one priority" (Cooper, 2000: 113). Early work by James Reason argued that an ideal safety culture was "the engine that continues to propel the system toward the goal of maximum safety health, regardless of the leadership's personality or current commercial concerns" (Reason, 1997: 195). Since then, the concept has become widespread based on an assumption that a culture can be engineered to reduce accidents and contain risks (Silbey, 2009). Studies single out the importance of such features as training, extensive communication on the importance of safety, low thresholds for reporting incidents, flexible employees who are able to learn, and protections for whistle-blowers in creating a safety culture (e.g., see Flin et al., 2000; Reason, 1998, 2000; Silbey, 2009). However, this work has been criticized for its inability to demonstrate causal relationships between such features and safety performance, a lack of

conceptual clarity as to what, exactly, constitutes a safety culture, and a neglect of inequalities in power and authority and competing sets of legitimate interests in organizations (Clarke, 2000; Kim & Wang, 2009; Silbey, 2009).

Another example of work that directly or indirectly attends to the notion of a risk culture are studies of 'high-reliability' organizations (HROs) such as aircraft carriers, chemical plants, health care teams and nuclear energy plants (e.g., Bierly & Spender, 1995; Bigley & Roberts, 2001; Klein et al., 1995). HROs operate safely in domains where high reliability is important as a result of an organizational culture in which leaders prioritize reliability; consensus exists around clear goals; wide-ranging redundancies of organizational systems ensure that if one fails another can take over; and there is an emphasis on organizational learning. Employees are attentive to minor deviations in operations and engage in 'mindfulness' or 'heedful interrelating' in ways that allow them to prevent, respond to and/or learn from risk incidents (e.g., Christianson et al., 2011; Weick & Roberts, 1993; Weick, Sutcliffe & Obstfeld, 1999). Similar cultural attributes are also reported to feature prominently in resilient organizations (e.g., Powley, 2009; Van Der Vegt et al., 2015; Williams et al., 2017). However, studies of reliability and resilience have been criticized for: failing to demonstrate how specific features improve reliability and resilience; concentrating on very specific kinds of organizations whose processes may not be transferable, especially to organizations facing budgetary or market pressures; taking the organizational hierarchy for granted; and ignoring the wider social and political context (e.g., Boin & Schulman, 2008; Busby, 2006; Silbey, 2009).

The notion of a risk culture has been extended into studies of financial services (Power, 2020; Power et al., 2013) organizations where some level of risk-taking to capitalize on opportunities is viewed as desirable. Rather than focusing on risk avoidance, financial services firms strive for an organizational culture that balances the logics of precaution (i.e. safety) and opportunity (Palermo et al., 2017) in accordance with their appetite for risk (Pan, Siegel & Wang, 2017). This balance (or lack thereof), along with the norms, attitudes and behaviours that produce it, represent the organization's risk culture, which, importantly, is viewed as malleable by managers

and, hence, subject to optimization (e.g., Banks, 2012; Bozeman & Kingsley, 1998; Revet & Langumier, 2015).

Many studies present successful examples of organizations whose risk cultures allow them to organize risk across all three modes. Insofar as risk culture is seen as an ideational entity – "a unified system of values or norms that unequivocally direct the way we think and act" (Giorgi et al., 2015: 13) – the effort is to engineer an 'optimal' culture that can address the three modes. Accordingly, risks can be prospectively organized through a culture that focuses employees' attention on anticipating and preventing potential dangers. This reduces the chances of a major risk incident occurring but, if one does, then an appropriate risk culture facilitates the real-time organizing of risk by activating procedures designed to cope with unexpected events and adapt to emerging, unforeseen problems. Finally, organizations with robust risk cultures can retrospectively organize risk through the systematic analysis of incidents and near misses to enhance organizational learning. The underlying assumption of this work is that an 'optimal' risk culture can – or at least should – be engineered. Conversely, the failure to organize risk is often attributed to defects in an organization's risk culture (Hopkins, 1999; Palermo et al., 2017; Power et al., 2013).

Organizing Risk through Risk Work

A second perspective draws on the concept of 'risk work,' which is defined as "situated human effort, in combination with material infrastructure, through which risk management and governance practices come to be constructed" (Power, 2016a: 3). Following the 'turn to work' (Phillips & Lawrence, 2012) more generally, this perspective examines how risk is organized through the interactions of embedded, embodied agents in particular contexts as they engage in day-to-day activities (e.g., Palermo, 2016). It assumes that organizational encounters with risk are "a routine and systematic part of daily organizational life" (Vaughan, 2005: 33). This perspective thus adopts a finely grained, bottom-up focus that directs attention to "the actions and routines through which organizational actors make sense of risk, of themselves and their roles, and collectively try to enact institutional scripts" (Power, 2016a: 8). It is therefore concerned more with everyday

processes and practices rather than high-profile, momentous events associated with risk incidents; and it sees the identification of risk as an outcome of various forms of risk work rather than resulting from applications of expert knowledge grounded in statistical thinking (Corvellec, 2010; Boholm, 2010).

Studies show that risk work can take a number of different forms. For example, Demortain's (2016; 2020) study of the development of a framework for risk assessment in the US government (see NAS–NRC, 1983) shows how risk work takes the form of institutional work – formalizing and standardizing practices across diverse organizations in fields such as food safety, occupational health and environmental protection, thereby reinforcing institutionalized assumptions such as the boundary between science and policy. Seemingly mundane practices – forming a committee, establishing its terms of reference and setting its agenda, and drafting and redrafting its report – strongly influenced the subsequent institutional design of how risk came to be organized. Horlick-Jones (2005) discusses how risk work in both corporate and government sectors is shaped by institutionalized governance guidelines. Maguire & Hardy (2016) show how the institutionalized nature of risk work varies depending on the nature of the risk. When the risk is familiar, risk work is conducted by experts who occupy central roles in the field and enact routine, institutionalized practices. When the risk is unfamiliar or novel, risk work is undertaken by peripheral actors who question the appropriateness of the incumbent body of risk knowledge and advocate alternative methods and procedures, often generating conflict among organizations in the field.

Studies of risk work also indicate an important emotional-affective dimension despite risk's strong association with detached, rational calculation. For example, Boholm and Corvellec (2016) show how risk work to identify risks involves the enactment of valuation practices. For something to be 'at risk', it must first be considered sufficiently valuable to merit protection. These authors illustrate how value is an outcome of ongoing, situated activities of defining, hierarchizing and calculating that serve to condition actors' preferences. Mikes (2016) shows how risk work can involve struggles to make risk more emotionally salient in order that action might be taken. Other

studies show how risk work may involve actions to reduce the emotion associated with risk (Gayle et al., 2016). For example, as crises emerge, the risk work of authorities may take the form of emotion work to avoid panic (Fein & Isaacson, 2009). A study of health risks in hospitals shows how risk work by health care workers is performed to manage both workers' emotions and patients' fear (Fischer & McGivern, 2016).

Studies adopting the risk work perspective have also demonstrated the important role that material artefacts play in organizing risk (Power, 2016b). Whereas work on culture emphasizes the symbolic aspects of materiality (see Giorgi, Lockwood & Glynn, 2015), risk work attends to the 'affordances' of materiality (Orlikowski & Scott, 2008) insofar as studies show "action possibilities for individuals … inscribed in the material nature of the environment or artefacts" (Carlile et al., 2013: 4). For example, Vargha's (2016) study of risk work in financial services organizations illustrates how artefacts such as questionnaires and pre-packaged software structured employee-customer interactions, shaping conclusions concerning customers' attitudes to risk as well as subsequent risk management decisions. Jordan and colleagues (2013) show how the device of the risk map, for all its design flaws and simplifications, facilitated a convergent, shared understanding of risk among different groups. In an airline setting, Palermo (2016) shows how risk work prior to an incident was made easier for pilots by a software application for reporting safety incidents; but this same artefact then served as a forensic resource after incidents, constraining pilots while enabling the risk work of investigators. Hall and Fernando (2016) study the use of standardized risk metrics across diverse divisions in an NGO, showing how an unreflective reliance upon these artefacts crowded out local knowledge, leading to too much emphasis on compliance and too little on emerging threats.

These studies of risk work are compatible with the three modes of organizing risk, even though they do not explicitly engage with them. Many identify risk work undertaken during the prospective mode to identify risks (e.g., Boholm, 2010; Boholm & Corvellec, 2011; Horlick-Jones, 2005). Some focus on risk work undertaken after risks begin to materialize, such as real-time efforts

to reduce negative emotions (e.g., Corvellec, 2009; Hall & Renuka, 2016; Jørgensen & Jordan, 2016), while others show risk work during the retrospective mode (e.g., Palermo, 2016).

Organizing Risk through Risk Translation

Our literature review identified a small but insightful body of research which shows that meanings can change – and be changed – through a process known as risk translation. These studies draw on the constructionist/discursive approach to risk which emphasizes how meanings in relation to risk are attached to particular objects through organizing processes. Insofar as translation, in general, refers to the process whereby meanings are transformed (Czarniawska & Sevón, 1996; Maguire & Hardy, 2009; Zilber, 2006), risk translation refers to the process through which an object's meaning in relation to risk is changed (Czarniawska, 2019). Through translation, a risk to an individual may become a risk to one or more organizations; an object that was safe can become risky; and, in fact, actors at risk can become safe (Hardy & Maguire, 2019). Risk translations can result in strategic or political advantages by helping to "redistribute responsibility for risks, change the locus of decision-making, and determine who has the right – and who has the obligation – to 'do something"' (Hilgartner, 1992: 47). Separate bodies of work have identified two forms of risk translation, described below.

One form of risk translation has been noted in the organizational literature. It occurs when risks to individuals are translated into risks to organizations as, for example, when the risk to a customer of slipping on a wet floor in a store is translated into a legal risk to the organization (Power et al., 2009). As the discourse and language of risk have become more pervasive (Hardy & Maguire, 2016; Power, 2004), new categories of organizational risks have emerged. Organizational risks now reflect "many different concerns, from the loss of money, time, or other scarce resources, to loss of legitimacy and damaged reputation" (Beamish, 2019: 88; also see Annett, 2019). They include more recent, operational (Power, 2005), reputational (Power et al., 2009; Scott & Walsham, 2005) and strategic risks (Slywotzky & Drzik, 2005), in addition to longstanding regulatory, financial, legal and economic risks. The growing number of risk categories increases opportunities

for organizational risk translation (Maguire & Hardy, 2019) and a single risk object can be translated into multiple risks to diverse organizations. For example, Hardy and Maguire (2019) show how health risks to individuals from products containing the potentially toxic chemical bisphenol A (BPA) were translated into a wide range of different organizational risks – regulatory risk to manufacturers, reputational risk to retail organizations and NGOs, operational risk to regulators, and professional risk to scientists.

A second form of risk translation has been noted in the governmentality literature, although the specific term has not been used (e.g., Ewald, 1991, Rose, 2001; O'Malley, 2004). This literature draws explicitly from the work of Foucault (1980; 1991) and focuses on how risks such as unemployment, old age, illness, etc., which once would have been borne by the state, have become 'individualized' i.e., risks to state organizations have been translated into risks to individuals (Binkley, 2009; Elliott, 2002; Stypinska, 2018; Vaz & Bruno, 2003). For example, the neo-liberal discourse of 'enterprise' (Du Gay, 1996) encourages citizens to be enterprising – to take on more risks and assume responsibility for managing them (Ainsworth & Hardy, 2008; Hacker, 2006). In this way, individualizing risk helps to remove state obligations to manage risks by shifting the welfare state "away from shared responsibility for managing social risks through collective pooling mechanisms towards more individualized responsibility for managing life course risks such as unemployment, parenthood and disability" (Hamilton, 2014: 453).

The consequences of this form of risk translation can be significant. Whereas citizens and governments once shared these risks, citizens are now expected to bear more of the risks and to take responsibility for managing them. If they fail, they can become viewed as risk producers: individuals at risk of mental health problems are held responsible for producing risks that endanger the public (Callaghan & Grundy, 2018); refugees at risk from persecution become risks to national borders (Watkins, 2017); and HIV-positive individuals facing various health risks are seen as posing risks to others (Davis, 2007). This, in turn, authorizes the state to implement sanctions against individuals it labels as unsatisfactory risk managers and/or recalcitrant risk producers.

Vulnerable, marginalized individuals are thus further disempowered as they "are exposed to more risks but are also themselves categorized as bad risks" (Doyle, 2007: 8). We can see, then, a link between how risk is organized and inequality (Curran, 2016): many environmental and health risks disproportionally affect disadvantaged groups; the disadvantaged are less able to address the risks they face than society's elites; and techniques for managing risk often distribute costs and burdens in ways that exacerbate levels of inequality (Centre for the Study of Risk Inequality, 2020).

As with the other two perspectives, the work on risk translations does not explicitly articulate any reference to the three modes of organizing risk. However, we argue that it, too, is consistent with this conceptualization. Insofar as risks to individuals are translated into new categories of organizational risk, the assumption is that the organizations that translate them will then organize them, whether it be prospectively, in real-time, or retrospectively. Translations that individualize risk help to ensure that individuals will take over organizing risk from government organizations. In other words, organizing risk still occurs when risks are translated, albeit that a different actor takes on – or is made to take on – responsibility.

Recapping our review of the literature (see Table 1), we first examined how separate bodies of literature on risk provide insight into three different modes for organizing risk. Our review also examined three perspectives which use different analytic frameworks for understanding how risk is organized – risk culture, risk work and risk translation. While these perspectives do not explicitly engage with our conceptualization of three modes, they nonetheless contribute to our understanding of them and, potentially, cut across more than one mode. In this regard, they provide an important resource for our subsequent insights into a cycle of organizing risk, discussed in the next section.

—Table 1 near here—

CRITICAL ISSUES AND NEW INSIGHTS

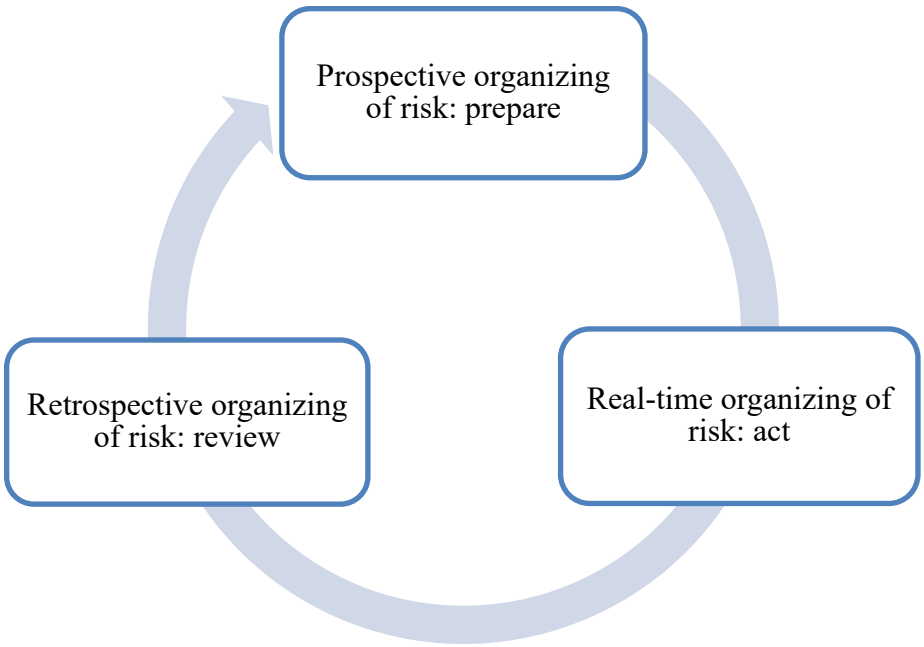
In this section, we present three critical issues that we identified from our review of the literature. The first critical issue concerns the tendency of the risk literature to focus on a single mode even though situations commonly arise that require organizations to engage with multiple

modes. Accordingly, we present a series of new insights that allow us to develop further the concept of a 'risk cycle' and discuss how organizations transition from one mode to another. The second critical issue concerns the tensions that characterize each of the three modes – although the existing literature acknowledges that such tensions exist, it offers little understanding of how organizations deal with them. Accordingly, we present a series of new insights that show how the risk work perspective can contribute to our understanding of these tensions. The third critical issue concerns how risk translations not only change the meaning of objects in relation to risk, but also change power relations among actors. Accordingly, we present a series of new insights that help researchers understand the way in which organizing risk is situated in a larger socio-political context.

The Risk Cycle

The first critical issue arises because much of the literature focuses on only one of the three modes for organizing risk. In contrast, our integrated approach enables us to develop the insight that organizations are involved in more than one mode and, in fact, engage with a *cycle* of organizing risk (Figure 1). A cycle of risk arises when, despite using various techniques to organize risks prospectively, some risks nonetheless materialize and have to be organized in real-time; and, subsequent to such incidents (including near misses), these risks are then organized retrospectively through some sort of review or investigation, ostensibly with the aim of improving how risk is organized in the future. For example, firefighting organizations engage with a risk cycle when they prospectively take steps to reduce the likelihood of bushfires breaking out (Chen, Blong & Jacobson, 2003). However, as recent events in California and Australia show, fires inevitably break out, resulting in real-time firefighting (Barton & Sutcliffe, 2009). After a fire, particularly if there is a notable loss of life and/or property, there is usually some kind of review to investigate, attribute causality, and recommend changes in future firefighting practices (Dwyer & Hardy, 2016; Stern, 2018) with a view to improving how future fire risks are organized.

Figure 1: The Risk Cycle



The risk cycle can take different forms. A single organization may engage with all three modes as in the bushfire example above. Alternatively, different organizations may be involved. For example, in case of foot & mouth disease in the UK (Delgado et al., 2017), farmers play a key role in the prospective mode by monitoring their livestock; the government becomes more actively involved in the real-time mode by culling affected herds and implementing quarantine measures; and, following a breakout, an independent inquiry is often assigned responsibility for the retrospective mode. Many organizations start to engage with the risk cycle during the prospective mode – as they identify risks that they then seek to prevent or reduce. However, if the risk was not anticipated, the organization may only start to engage with the risk cycle when the risk materializes (i.e., in the real-time mode). It is also possible for the risk cycle to begin with the retrospective mode if the language of risk is first used during a review to reconstruct prior events, which then forms the basis of how similar events will be organized during subsequent modes in the future, i.e. as risks.

The fragmented nature of the literature is problematic because it diverts attention away from the ongoing, continuous way in which risk is organized. This, in turn, makes it difficult to

understand how organizations transition between modes. Consequently, researchers know very little about a range of questions. What sets transitions between the modes in motion? What is the nature of any 'handover' between actors involved in the transition? What is the nature of the demarcation between the two modes involved in the transition? Why is the transition important? Accordingly, in the remainder of this section we offer our insights regarding these questions (see Table 2 for a summary).

—Table 2 near here—

Transitions from the prospective to the real-time mode: we propose that the switch from predicting and/or avoiding risk incidents to dealing with them as they materialize is more likely to be set in motion when there is a familiar, widely recognized trigger. In the bushfire example above, when a planned, precautionary fire carried out to reduce fuel loads during the prospective mode breaks through designated containment lines, the real-time mode quickly follows. In some cases, however, the trigger may not be so clear. For example, in the early days of SARS (and more currently, in the case of COVID-19), organizations were slow to recognize and act on its symptoms, which are similar to those of influenza (Hong & Collins, 2006). The result was that the transition into the real-time mode – taking steps to contain the spread of SARS in the community – was delayed, leading to the infection of additional individuals (Salehi & Ali, 2006).

As far as handovers during this transition are concerned, different dynamics are likely to occur if the actors involved in prospectively organizing risk are also responsible for organizing it in real-time, compared to situations where responsibility is handed over to other actors. In the former case, abandoning the 'cool' monitoring of risks associated with the prospective mode and switching into a 'hot' emergency response as a risk begins to materialize may be difficult, even though lives may depend on it as, for example, when bushfire risks materialize (Weick, 1993). If different actors are involved, it seems likely that the transition will be adversely affected if there is conflict or a lack of collaboration among them, as appears to have been the case of the 2003 outbreak of SARS in Canada where the transition into real-time management of the crisis was hampered by "conflict

between federal, provincial, and territorial governments over the division of jurisdictional responsibilities" (Salehi & Ali, 2006: 378).

A third insight regarding this transition is that it is important not to assume that the different modes are necessarily clearly demarcated. In some cases, organizations may intentionally blur the boundary between them. For example, the risk associated with mid-air collisions is organized prospectively through 'rules of separation' that establish a minimum allowable distance between aircraft (Vaughan, 2005). If these rules are violated, pilots are instructed to change the aircraft's speed and/or trajectory to regain adequate distance from other aircraft. In this way, the real-time organizing of a 'proxy' risk, i.e. breaching rules of separation, is, therefore a way of organizing the 'high stakes' risk prospectively. Given that the negative consequences of the latter are significant, blurring the boundary between the prospective and real-time modes through proxy risks may be an important way to organize particularly consequential risks.

Transitions from real-time to retrospective mode: we suggest that this transition – whereby a risk incident *becomes* subjected to investigation – can be triggered either routinely or exceptionally. In the former case, particular features of an incident, such as aircraft malfunctioning or losses from bad loans that exceed some threshold in a banking context, automatically lead to an inquiry or review. In the latter case, deliberations after an incident influence its status as earlier events are *re*-constructed as having been sufficiently significant to be submitted to retrospective organizing protocols. In both routine and exceptional cases, the transition involves an event being categorized as a 'risk incident' through various practices, whether they involve taken-for-granted triggers that prompt automatic responses or idiosyncratic ones that emerge from highly contested, politicized deliberations. What constitutes a trigger, how they are selected and whether they are constructed after the fact are all questions that deserve further investigation. Similarly, we also need to know more about the *failure* to set this transition in motion by, for example, sweeping incidents 'under the carpet' through risk denial and risk minimization.

This transition typically involves a handover between different sets of actors as the actions

of those involved in the real-time organizing of risk are scrutinized by separate, 'independent' investigators, who may be from a different organizational unit or from outside the organization, to pinpoint what "people missed and should not have missed; what they did not do but should have done" (Dekker, 2002: 373). Such handovers are taken-for-granted and the ability of individuals who were not involved in the risk incident to look back – over time and from a distance – and to judge the actions of actors who were directly involved is rarely questioned. Moreover, the two modes are assumed to be clearly demarcated insofar as an incident is seen as a self-contained episode whose 'facts' can be ascertained at a later stage even though the two modes may, in fact, interpolate each other. What can be known after an incident depends on what was measured, observed and noted during it; and the past can be 'rewritten' during an inquiry or review and, in this way, become the official account of what happened.

Transitions from retrospective to prospective mode: we know little about what happens after an inquiry and whether it has an impact on subsequent risk cycles – whether the retrospection associated with some form of inquiry leads to action regarding how risk is organized in the future. With regard to the handover, recommendations made by an external inquiry are typically handed back to the organization(s) involved in the incident to implement. Internal handovers often involve employees with forensic roles, such as accountants and engineers, handing responsibility back to management for any recommended restructuring, retraining, etc. In neither case do we know much about how these handovers take place or how abstract knowledge produced through an inquiry becomes embedded in organizational practices and processes. Nor do we know much about the circumstances that produce a clear demarcation between the modes i.e., a 'fresh start' – with the implementation of dramatically different organizational practices and processes for organizing risk, such as significant changes in personnel, new technologies, etc. – compared to those that lead to minor adaptations or no change at all.

In sum, the insight that organizations engage with a risk cycle draws attention to the need for both researchers and practitioners to develop a better understanding of how organizations

engage with multiple modes and transition between them. It is important to learn more about how organizations move through the risk cycle because delays or failures in transitioning can intensify the negative effects of a materializing risk, making it harder to organize effectively in real-time; result in risk incidents being swept under the carpet; and/or preclude opportunities for actioning new risk knowledge.

Addressing Tensions in the Risk Cycle

Our review of the literature indicated that each of the three modes was associated with potential tensions between two sets of practices. These tensions are a critical issue insofar as the existing literature fails to explain why they exist or identify how organizations might address them. Consequently, researchers know very little about a range of questions. Why do the tensions arise i.e., why do organizations find it difficult to enact alternative practices, switch between predominant and alternative practices or combine the two sets of practices contemporaneously? Why are the tensions important? Why is the existing literature limited in terms of shedding light on these tensions? What contributions can research adopting the risk culture perspective provide? What does the newly emerging risk work perspective offer in terms of studying, explaining and resolving the tensions? Accordingly, in the remainder of this section, we offer our insights regarding these questions (see Table 3 for a summary).

—Table 3 near here—

The tension between normalizing and problematizing: this tension arises because of common preconceptions about the nature of risk knowledge and power relations. Specifically, the knowledge on which normalizing is based is assumed to be value-free and apolitical even though it may be the outcome of prior contestation; while the dominance of science and legitimacy of experts is taken-for-granted. In contrast, problematizing involves challenging experts and questioning scientific knowledge. As a result, it is often seen as leading to the politicization of risk, making it difficult to build consensus, and even providing space for the denial of important risks like climate

change. Accordingly, organizations are more likely to enact normalizing practices and view the alternative – problematizing – with suspicion. This is problematic since, while normalizing practices may allow organizations to address familiar risks prospectively, problematizing may be needed to organize novel risks.

The problem is compounded because the dominance of the realist approach in the literature pertaining to the prospective mode results in many more studies of normalizing than of problematizing. Studies based on the idea of a risk culture as an ideational entity offer some insights into this tension by providing rich examples of organizations that have been successful in preventing risks from materializing. If risk culture is also seen as ongoing process whereby actors draw upon established practices, categories and meanings in the course of their work (see, for example, McQueen, 2020), the concept of risk culture becomes more open-ended, allowing for the consideration of the difficulties associated with problematizing, such as when risks cannot be calculated.

Research based on the risk work perspective focuses on the day-to-day actions and struggles of all actors – expert and non-expert – to create and apply risk knowledge of some form or another to identify risks. In doing so, it is able to specify the distinct practices that are enacted, by whom, where and why, thereby helping to add additional insight into how risk cultures are created, maintained and changed. In identifying these practices, it is agnostic as to whether the apparent certainty associated with the existing scientific body of risk knowledge should serve as a basis for organizing risk or whether organizations should pay more attention to scientific uncertainty and take a precautionary approach. Also, risk work's attention to the affordances of materiality takes into account the way in which many artefacts used in the prospective mode – such as instrumentation for assessing water quality and associated health risks that has been designed to detect only a limited number of familiar, known contaminants – promote and reinforce normalizing rather than problematizing. In this way, studies of risk work have the potential to identify difficulties in enacting problematizing practices, as well as shed light on whether and how

normalizing and problematizing practices can be combined, substituted for each other and/or distributed across different roles and units.

The tension between controlling and improvising: this tension arises because of common preconceptions that privilege risk knowledge embedded in pre-existing, formal protocols and plans and the authority of senior members of the hierarchy. As a result, controlling practices are more likely to be enacted as risks materialize; in fact, the centralization of formal authority is a common and immediate response to many crises. In contrast, individual attempts to improvise may be interpreted as challenges to authority based on imperfect knowledge and deemed irresponsible, especially during emergencies. In addition, organizations may find it hard to identify in advance the circumstances under which, or degree to which, they will allow employees to improvise. This is problematic because, while controlling may ensure the centralization and standardization needed to deal with anticipated, well-rehearsed risk incidents, improvising may be needed if the risk materializes in unexpected ways.

The problem is compounded since much of the literature pertaining to the real-time mode involves studies of controlling rather than improvising. Studies of crises and disasters often feature the implementation of previously prepared plans that employees are expected to follow during an emergency. The research on risk monitoring also emphasizes the use of standard operating procedures that have been developed centrally – either within the organization or by regulators – to assess on an ongoing basis whether stipulated risk levels are being exceeded and, if so, prescribe corrective actions. Sensemaking studies do examine improvising during crises, but they rarely interrogate it by investigating how the fundamental organizational conflict between centralizing and decentralizing responsibility is resolved to allow improvising to occur. Studies of risk cultures show that certain organizations, such as HROs, are able to engage in both controlling and improvising, although they rarely discuss how the local, tacit and embodied risk knowledge of front-line employees is incorporated into organizational decisions and actions.

Research based on the risk work perspective focuses on the day-to-day actions and struggles

of all actors as they navigate codified and tacit forms of knowledge, regardless of their place in the hierarchy. It therefore contributes to our understanding of risk cultures by identifying the specific ways in which the risk knowledge of front-line employees is incorporated into organizational decisions and actions, as well as how those lower down the hierarchy are able to secure sufficient autonomy and discretion to improvise. In doing so, this perspective accepts both pre-existing, codified knowledge and local, tacit/embodied knowledge as a viable basis for organizing risk in real-time. Additionally, its attention to materiality helps to explain why certain artefacts used in the real-time mode – such as checklists that direct workers' attention to anticipated equipment failures but not to equipment assumed to be fail-safe, or communications infrastructure that channels facility operational data to a remote, centralized crisis management location, but not to local workers during an emergency – often promote and reinforce controlling rather than improvising. In this way, studies of risk work have the potential to illuminate difficulties in enacting improvising practices, as well as shed light on how controlling and improvising can be combined, substituted for each other and/or distributed across roles or units.

The tension between blaming and learning: this tension arises because of common preconceptions that privilege new risk knowledge developed by post hoc, independent reviews and inquiries, where the expertise of experts and the authority of adjudicators are considered more legitimate than the experience of frontline workers and laypeople involved in, or witnesses to, a risk incident. Blaming often plays a major role in the retrospective mode because inquiries are charged with a wider remit of assigning accountability and dispensing justice. Blaming may also be accepted because, when directed at individuals rather than systems, it avoids more fundamental critiques that might threaten vested interests. This is problematic because, although blaming may assuage demands for accountability and justice, it can preclude the learning required for improvements to be made in how risk is organized in the future.

The problem is compounded because studies of public inquiries tend to focus on explaining why blaming occurs but have spent less attention on exploring how learning might be brought

about. Studies of risk culture help us understand how particular cultural attributes contribute to organizational learning from risk incidents. However, by focusing on the risk cultures of individual organizations, they tend to underplay broader social/political pressures, such as a strong public appetite for blaming, a media industry that revels in 'blameworthy' stories and the vested interests favouring the political status quo. Without acknowledging the moral function of inquiries and political interests of stakeholders, it is difficult to develop a deeper understanding of why this tension arises.

Research based on the risk work perspective focuses on the day-to-day actions and struggles of all actors – independent experts and lay persons, as well as those inside and outside the organization – in interpreting risk incidents. It is open to the idea that both holistic, convergent accounts and local, partial, potentially contradictory accounts can contribute to the development of new risk knowledge. Additionally, its attention to materiality helps to explain why certain artefacts used in the retrospective mode – such as, following an accident, the forensic use of data generated by software that recorded all interactions that workers had with it during the accident – may promote blaming rather than learning. In this way, studies of risk work have the potential to illuminate the difficulties in enacting learning practices, as well as shed light on whether it is possible to combine demands for justice with demands that incidents never happen again.

In sum, the risk tensions are important in that they make it difficult for organizations to navigate between different sets of practices which, in turn, may hamper their ability to organize risk across the risk cycle. The work on risk culture offers some insights into organizations that have addressed these tensions. Studies of risk work enrich these insights by focusing on what actors do in specific contexts through the mobilization of particular resources and material affordances to generate risk-related understandings. By exploring tensions as an emergent, evolving outcome of the enactment of situated, socio-material practices, the risk work perspective helps to illuminate the ways in which organizations resolve, adapt to, embrace or overcome them.

Translating Risk: Towards a Bigger Picture

Our review of the literature indicated that the meaning of an object in relation to risk is not singular and stable and can, in fact, change through risk translation. However, risk translation remains an under-researched area in the organizational literature, giving rise to a critical issue insofar as researchers know very little about a range of important questions. What are the dynamics of different translations? What discourses facilitate risk translation? What are the implications of risk translation for power relations? What are the implications for the risk cycle? Why is it important to study risk translations? Accordingly, we offer our insights regarding these questions by building on the two forms of risk translation identified in the existing literature – organizational risk translations and individualizing risk translations. In this way, we help researchers to understand the 'bigger picture' i.e., the way in which organizing risk is situated in – and contributes to – a larger socio-political context (see Table 4 for a summary).

—Table 4 near here—

Organizational risk translations: as discussed in the literature review, one form of risk translation occurs when the meaning of a risk object that threatens an individual is translated into one or more categories of organizational risk, thereby potentially affecting multiple organizations. Accordingly, risks can proliferate as the original object continues to pose a risk to something valued by individuals, but also becomes associated with risks to things valued by organizations. For example, risks of modern slavery to vulnerable workers working in upstream manufacturers can be translated into reputational and legal risks to downstream retailers and, if retailers then demand 'slavery-free' practices on the part of suppliers, into operational and strategic risks to these organizations (Hardy, Bhakoo & Maguire, 2020). This form of risk translation is facilitated by the intensification of the dominant discourse of risk which, by creating ever more nuanced subdivisions of risks to organizations' reputations, operations, finances and so forth, has expanded the conditions of possibility for this form of translation. It is also facilitated by the intersection of the discourse of risk with other, new discourses – such as the discourse of modern slavery in the example above.

While this form of risk translation increases the number of risks that an organization may face, it also increases its power to act on those risks. Organizations may struggle to understand risks to individuals associated with, for example, climate change, pollution, or infectious diseases since these risks are complex and organizational responsibilities are unclear. However, organizations usually *do* know what to do when they face specific legal, financial, regulatory, reputational, operational or strategic risks to themselves. Policies, routines and techniques are often already in place. Accordingly, this form of risk translation is potentially 'performative' (cf. Austin, 1962) in that the language of risk does not simply bring a new organizational risk into existence, it also generates capabilities that enable organizations to deal with it.

Additionally, by reconfiguring power relations among actors, organizational risk translation may be harnessed by some actors to pressure organizations to act on risks to individuals which they otherwise might not. In the example of modern slavery, early research indicates a relatively low level of compliance with recent legislation because financial penalties are small and the costs of making supply chains compliant are high (e.g., Kim & Davis, 2016). However, the cost-benefit analysis of compliance or not changes if, for example, NGOs and the media translate individual risks to vulnerable workers into reputational risks to organizations through naming and shaming campaigns. Consumers can then exercise power by buying brands whose supply chains are not marked by modern slavery. Translating organizational risks is, then, a way to encourage organizations to engage with the risk cycle, thereby indirectly taking action on risks to individuals.

Individualizing risk translations: in this form of translation, risks to organizations are translated into risks to individuals. While existing research has focused almost exclusively on government organizations, we suggest that this form of risk translation also takes place in the organizational sphere more generally, and that it increases the power of organizations over individuals. Further, it may contribute to inequality as, often, vulnerable individuals are required to bear the burden of risks that once would have been the responsibility of organizations. For example, the recent increase in the use of independent or contract workers (e.g., Petriglieri, Ashford &

Wrzesniewski, 2019) means that, rather than the organization having to bear the risks of an economic downturn and fluctuating demand, it is now workers who risk losing their jobs and who must take responsibility for making themselves employable in order to find a new one (Neff, 2012), with unskilled workers in precarious roles particularly vulnerable. Similarly, the decline of defined benefits pension plans means that employees now bear risks that have been shifted to them from their employers (Cobb, 2015). Employees are also encouraged to manage more risks inside organizations. For example, in the case of workplace safety, it has been noted that employees are increasingly expected to practice individual responsibility by asking questions, making complaints and exercising safety rights (Gray, 2009). A similar process appears to be occurring with other workplace risks such as bullying, sexual harassment and discrimination as employees are required to undertake the necessary training and then to carry out designated steps to organize risks individually.

Individualizing risk translations are facilitated by discourses such as 'flexibilization,' which emphasizes the importance of ensuring that workforces are flexible and organizations are agile (see, for example, Dunford et al., 2013), 'privatization,' which emphasises the importance of individuals taking responsibility for risks associated with work (see for example, Neff, 2012), and 'responsibilization' (Silbey, 2009). These discourses are not new to organizations, having long been bound up with the broader discourse of neo-liberalism (see Fairclough, 2002). However, they have intensified with new information technologies, expansion of the gig economy and deregulation.

Individualizing translations increase the organization's power over individuals by forcing the latter to take on more risk work. This form of risk translation is repressive: organizations bear fewer risks themselves, have fewer obligations to help their employees shoulder the risks that they face, and are less accountable when they fail to organize workplace risks to individual employees. As a result, the organization's need to invest in measures for dealing with risks to individuals are reduced as this responsibility falls on employees. As far as the risk cycle is concerned, individuals are required to contribute more to organizing risks prospectively and in real-time, in place of the

organization. However, organizations tend to retain control of the retrospective mode, enabling them to label any 'failures' in organizing risk by individual employees and to sanction them accordingly.

In sum, we argue that risk translations are an important complement to the risk cycle – instead of studying a single risk in isolation as it is organized through the risk cycle, researchers should ascertain how the meaning of certain objects in relation to risk changes and, in so doing, reconfigures power relations among actors. In this way the study of risk translations helps organizational scholars to see the bigger, socio-political picture in two ways. First, organizational risk translations may be leveraged to generate organizational action on significant individual and societal risks. Second, individualizing risk translations often involve increasing the power of the organization at the expense of individual employees, which can contribute to inequality insomuch as vulnerable individuals have bear the burden of risks that would once have been the responsibility of organizations.

IMPLICATIONS FOR FUTURE RESEARCH

In this section, we discuss avenues for future research on organizing risk. Having raised substantive questions regarding risk that future research could investigate in the previous section, we now explore methodological and analytical approaches that would seem to be particularly useful for investigating these questions.

Processual Studies of Risk

Given the fragmented nature of the risk literature, there is clearly a need for more integrative, processual research that takes into account all three modes of the risk cycle, as well as the transitions between them. To do so, researchers first need to select settings for their studies where the different modes can be investigated. One such setting concerns organizations operating in risky contexts which engage with the entire risk cycle over time and under extreme conditions. The processes for dealing with and transitioning between the different modes should be highly visible in

these circumstances, making it easier for researchers to study them. Future research could also study the risk cycle in organizations that operate in more 'mundane' risk environments. For example, most universities require academics to organize risks to research subjects prospectively as part of securing ethics approval. In the event that risks materialize during the study, universities have procedures for dealing with them, as well as for reviewing incidents after the fact, which may then lead the university to revise its subsequent approval processes. Risk is being organized cyclically albeit in a more low-key manner than organizations in more extreme conditions. Comparisons could be made between 'high profile' and 'low profile' risk cycles. Researchers interested in exploring intra-organizational vs. inter-organizational coordination in organizing risk could compare settings where a single organization is responsible for the entire risk cycle with those where multiple organizations are involved.

Another setting for future integrative, processual research would be situations where risk cycles have 'failed' in some way, particularly where consequences have been significant. For example, in the case of the Global Financial Crisis (GFC), it appears that the failure of financial institutions to organize risk effectively in the prospective mode led them to take on too much risk. These risks then materialized as major companies started to collapse, at which point it appears that the government failed to organize the risks effectively in real-time, thus adding "to the uncertainty and panic in the financial markets" (FCIC, 2011: xxi). Many commentators also point to the failure of the retrospective mode since, despite many investigations and reviews, the financial system is "in many respects, still unchanged from what existed on the eve of the crisis" (FCIC, 2011: xxvii). The lens of the risk cycle could be used to investigate examples like this one, which involves the failure of multiple organizations, and compare them with studies of failed risk cycles inside individual organizations.

The adoption of an explicitly processual methodology (Langley et al., 2013) would aid in tracing the activities of organizations as they transition through the risk cycle. The easiest way would be to conduct what Langley and Tsoukas (2017: 9) call 'developmental' process research –

starting with an outcome such as an incident or inquiry and then tracking backwards to see how risk was organized during preceding modes using interviews and/or archival data. In these settings, there is likely to be a 'thread' of documentation that could be tracked backwards relatively easily. Processual studies can also track events forwards (Langley, 2007). However, this option is likely to be more challenging and open-ended insofar as it would require a longitudinal study using an ethnography or multi-phased interviews to follow a risk being organized in one mode to see whether and how it moves through subsequent modes and/or what happens if these transitions do not occur. Processual studies will help to shed light on how organizations switch from planning to acting as risks materialize, what leads to a risk incident becoming the subject of an inquiry or not, and the circumstances under which the retrospective mode leads to significant changes in how risk is organized.

Practice-based Studies of Risk

To investigate the risk tensions, we advocate ethnographic studies that capture rich descriptions of the practices that constitute risk work and provide grounded, bottom-up and less rationalistically biased accounts of how actors recognize, experience and manage the tensions. By adopting a finely-grained 'turn to work' methodology (e.g., Barley & Kunda, 2001; Phillips & Lawrence, 2012), researchers can examine how actors, immersed in a practice, draw on certain discourses, use material artefacts, and engage in 'skilful' risk work to resolve the tensions that may arise in each mode (cf. Sandberg & Tsoukas, 2011; Sandberg & Tsoukas, 2016). In this way, a practice approach would both contribute to studies of risk cultures and help to develop the concept of risk work.

Additionally, by highlighting how the material and the social are 'entangled' with each other (Barad, 2003; Lupton, 2013b), practice-based research is able to ascertain the significant role that corporeality and materiality play in organizing risk. Taking materiality seriously is important given that the practices used to organize risk involve a wide range of artefacts. When we claim to 'see' a

risk, we see only an inscription of it: a balance sheet prospectively indicates a risk of bankruptcy; a Geiger counter denotes a real-time risk of radioactivity; a CCTV video played at an inquiry signifies an earlier risk of overcrowding in a football stadium. To develop our understanding of the role of materiality in organizing risk, studies could, for example, follow a particular artefact through the risk cycle to see how something like a pilot's checklist does not only identify particular risks prospectively, but also influences how risk is organized in real-time and provides a forensic audit trail after incidents which shapes the retrospective mode (see Power, 2016b).

Critical Studies of Risk

Finally, if we are to understand the power effects of risk translations, we advocate an explicitly critical perspective. This involves designing studies that are sensitive to "themes of social injustice and environmental destruction wrought by organizations" (Adler, Forbes & Willmott, 2007: 1). A critical approach 'de-naturalizes' the taken-for-granted nature of managerial interests and instrumental reasoning and focuses, instead, on "exploitation, repression, unfairness, [and] asymmetrical power relations" (Alvesson & Deetz, 2006: 256). As far as risk is concerned, the vast majority of research adopts rational, managerialist assumptions – studies of the power effects of risk translations are rare in organizational research. Accordingly, we suggest that critically oriented case studies of the risk cycle would explicitly investigate how power asymmetries both shape and emerge from organizing risk. Freed of managerialist assumptions, such studies can engage in more integrative theorizing that does not simply look at risk from the perspective of particular power holders but takes into account the network of the diverse stakeholders that are involved.

CONCLUSION

In this paper, we have explored how risk has become a crucial part of organizing, affecting a wide range of organizations in diverse sectors. We have shown that risk is organized in three different, though sometimes overlapping, modes – prospective, real-time, and retrospective – that constitute a cycle of organizing risk. There is a large amount of literature relevant to all three modes

although it does not always use the language of risk, and it tends to be fragmented insofar as each stream of research tends to focus on a single mode. Accordingly, our aim has been to integrate diverse bodies of research in order to identify a cycle of organizing risk and to provide new insights into the transitions, tensions and translations related to risk.

In some respects, risk is reminiscent of the way in which the concept of strategy permeated organizations in the latter decades of the last century, extending far beyond its base in multi-divisional manufacturing firms to infiltrate all kinds of public, private, governmental and NGOs. Today, there are few organizations that do not 'have' a strategy; 50 years ago, there would have been few that did. A similar expansionary phenomenon can be seen in the case of risk. In the case of strategy, academics scrambled to catch up with the growth of strategy initiatives in organizations. Initially, they focused on refining technical models for elaborating how strategy should be formulated (Ansoff, 1965; Porter, 1979). It took some time before critics started to detect the limitations of strategy (Mintzberg, 1973; Pascale, 1984); and longer still, before scholars identified the practices associated with 'doing' strategy (Whittington 1996) and unpicked the discourse of strategy to show its dominating effects (Knights & Morgan, 1991).

We cannot afford to waste time with risk. Risk has a far wider domain than strategy – it does not just pertain to organizational success but is bound up with pressing grand challenges (Ferraro, Etzion & Gehman, 2015) and wicked problems (Palmer, 2012). Many of the biggest risks confronting humanity cannot be well defined, much less neatly quantified (Beck, 1992; Giddens, 1999a, 1999b) and, yet, a considerable amount of research on risk continues to rely on a realist, technical approach. There is, then, considerable opportunity for organizational scholars to submit dominant understandings concerning risk to greater empirical and theoretical scrutiny, which, in turn, could greatly benefit the planet and the peoples on it. In fact, the importance of understanding how risk is organized and, in particular, the implications of the risk cycle have been unmistakably underlined by the COVID-19 pandemic, which is occurring as we write. Governments, private companies and NGOs have been engaging with all three modes of the risk cycle on an

unimaginably rapid and continuous basis. Each day has seen a cycle of trying to prevent momentous health risks from materializing; frantically addressing them in real-time – juggling command and control protocols with significant improvisation in order to do so; and then reflecting upon efforts and outcomes in order to recalibrate attempts to organize the risks only a few days later. Governments have taken decisions based on quantitative risk modelling but the fact that COVID-19 is a *novel* coronavirus introduces extensive scientific uncertainty. Various governments – and, many would argue, the more effective ones – have adopted a precautionary, problematizing approach in addition to actions based on scientific advice. Accordingly, we see the need for organizations to transition through the risk cycle regularly, repeatedly and rapidly, addressing the tensions as they play out in each mode. We also see the importance of risk translation as organizations of all kinds have translated the health risks to individuals into risks to themselves, the economy and society, which reverberate back into risks to other organizations. We hope that when this paper is published, the pandemic will be over and, as we look back, blaming about the origins of the pandemic will have been superseded by efforts to learn from it.

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TABLE 1: Summary of the Literature Review on Organizing Risk

	Prospective Mode	Real-Time Mode	Retrospective Mode
Relevant bodies of research	Risk analysis/perception; risk controversies; risk construction/risk discourse	Crises, disasters/accidents; risk/crisis sensemaking; risk monitoring	Public inquiries; organizational reviews
Key findings	Risk analysis is guided by realist, objectivist understandings of risk and optimism regarding organizations' ability to deal with it Laypersons' perceptions of risk are subject to bias Divergent views of risk are common and result in conflict and controversy The constructionist approach challenges the existence of pre-existing risks The dominant discourse of risk shapes the way in which meanings related to risk are attached to objects	Plans and protocols are an important way of preparing for risk incidents The (in)adequacy of plans and protocols can only be known during the real-time organizing of risk Risks can materialize in unanticipated ways which necessitate sensemaking and improvisation Organizing risk in real-time also occurs through continuous monitoring and adjustment of activities to keep them within tolerable limits	Public inquiries serve multiple purposes in addition to official objectives of improving the future organizing of risk, including restoring confidence, advancing political interests, and deflecting criticism Public inquiries can unintentionally amplify concerns about risk Auditing and safety reviews may help organizations to learn from errors The retrospective organizing of risk is prone to hindsight bias, blaming and failures of organizational learning
Predominant practices	*Normalizing:* using prevailing scientific methods, referencing extant research, invoking established experts, and encouraging action based on precedents	*Controlling:* implementing predetermined plans and protocols, centralizing decision authority, responding rigidly, and taking deliberate, practiced action	*Blaming:* adopting a limited scope of inquiry, framing problems to be solved narrowly, using linear cause-effect thinking, and focusing on human error in need of correction
Alternative practices	*Problematizing:* questioning the ability of existing knowledge to identify certain risks, disputing putative 'facts', challenging established experts, and promoting the need for new types of risk knowledge	*Improvising:* deviating from predetermined plans and protocols, decentralizing or delegating decision authority, responding flexibly, and taking emergent, exceptional action	*Learning:* adopting a broad scope of inquiry, framing problems to be solved widely, using systemic cause-effect thinking, and focusing on system design in need of correction
Risk culture perspective	Assumes that an optimal risk culture will result in effective prospective organizing of risk; however, because of extreme contexts, it may be impossible to prevent risks from materializing	Assumes that an optimal risk culture will result in effective real-time organizing of risk, even if the extreme context has prevented the risk being prospectively organized	Assumes that an optimal risk culture will result in effective retrospective organizing of risk, i.e. organizational learning, and subsequent changes in how risk is organized in the future
Risk work perspective	The majority of studies examine risk work undertaken to construct risks in organizations i.e., during the prospective mode	Some studies, particularly those involving efforts to manage emotions, examine risk work undertaken as risks materialize i.e., during the real-time mode	Some studies, particularly those involving forensic use of artefacts, examine risk work undertaken after a risk incident i.e., during the retrospective mode.
Risk translation perspective	Draws attention to translated risks that may be organized prospectively by different actors	Draws attention to translated risks that may need to be organized in real-time by different actors	Draws attention to translated risks that may need to be organized retrospectively by different actors

TABLE 2: Insights into Risk Transitions

Transition	Prospective to Real-Time	Real-Time to Retrospective	Retrospective to Prospective
What sets the transition in motion?	Transitions are more likely to be set in motion when there is a familiar, widely recognized trigger Transitions are more likely to be delayed or abandoned if triggers are unfamiliar, confusing or ambiguous	Transitions are set in motion routinely when there is a shared understanding that certain features of an incident automatically trigger a review or inquiry Transitions can also be set in motion exceptionally when triggers are debated and (re-) constructed after the incident	It is not clear what particular triggers set this transition in motion or whether and how retrospection leads to action
What is the nature of any 'handover' between actors during the transition?	If the same actors are involved in the two modes, they may find it difficult to switch to radically different practices, thus delaying or preventing the transition If different actors are involved in the two modes, conflicts of interest may delay or prevent the transition	Different groups of actors are typically involved in the two modes The ability of actors who were not present at the incident to judge the actions of others who were, and to do so after the risk incident, is usually taken-for-granted	Independent actors (from inside or outside the organization) typically hand recommendations over to another set of actors inside the organization for implementation Abstract knowledge developed during the inquiry or review has to be embedded in organizational practices and processes
What is the nature of the demarcation between the two modes involved in the transition?	There are circumstances that may lead organizations to blur the demarcation between these two modes e.g., by organizing a proxy risk in real-time as a way to organize another, 'high stakes' risk prospectively	The two modes are assumed to be clearly demarcated when in fact they may interpolate each other: what can be known after a risk incident is influenced by what data is compiled during it; and the past can be 'rewritten' afterwards to become the official account of the incident	We do not know the circumstances that lead to radically different practices being implemented (i.e., a 'fresh start') compared to the continuation of existing organizational practices and processes
Why is the transition important?	We need to know more about this transition because delayed or failed transitions can make it harder to organize risks that are beginning to materialize and/or worsen their adverse effects when they do materialize	We need to know more about this transition because it determines whether and how a risk incident is investigated	We need to know more about this transition because it is key to ensuring that new risk knowledge improves how risk is organized in the future

TABLE 3: Insights into Risk Tensions

	Prospective Mode	Real-time Mode	Retrospective Mode
Tension	Normalizing/Problematizing	Controlling/Improvising	Blaming/Learning
Why does the tension arise?	Actors privilege existing risk knowledge and defer to experts Problematizing is often associated with risk politicization and risk denial	Actors privilege existing risk knowledge embedded in plans and protocols, and defer to senior members of the hierarchy Improvising is often associated with challenges to prevailing notions of hierarchy	Actors privilege new risk knowledge developed by post hoc, independent inquiries and defer to independent adjudicators Learning is often associated with radical, systemic change that threatens vested interests
Why is the tension important?	Normalizing practices predominate, even though problematizing may be needed to organize novel risks prospectively	Controlling practices predominate, even though improvising may be needed to organize risks that materialize in unexpected ways	Blaming practices predominate, even though learning may be needed to improve how risk is organized in the future
Why is the existing literature limited?	Realist approaches dominate research on this mode; studies take normalizing for granted; studies of problematizing are rare	Studies of crises tend to emphasize controlling practices; when they do study improvising, they rarely explore associated hierarchical conflicts	Studies of inquiries tend to focus on blaming practices and failures to learn; they rarely examine when and how learning practices are enacted
What insights does research adopting the risk culture perspective provide?	Studies provide examples of organizations that have been successful in preventing risks from materializing	Studies show how certain organizations, such as HROs, are able to engage in both controlling and improvising	Studies have contributed an understanding of how organizations have instituted processes to learn from risk incidents
How can the risk work perspective help to shed light on the tension?	It is capable of specifying practices that address the tension by focusing on actions and struggles of all actors – experts and non-experts – to create and apply this knowledge as they identify and attend to specific risks It is agnostic about whether certainty associated with the prevailing, scientific risk knowledge or the uncertainty associated with challenges to existing risk knowledge can serve as a basis for organizing risk It takes material affordances into account	It is capable of specifying practices that address the tension by focusing on actions and struggles of all actors – regardless of their position in the hierarchy – to draw on and mobilize different types of knowledge as risk incidents arise It is agnostic about whether pre-existing, codified knowledge or emergent, embodied/tacit knowledge can serve as a basis for organizing risk It takes material affordances into account	It is capable of specifying the practices that address tension by focusing on actions and struggles of all actors – lay and expert, inside and outside the organization – to interpret risk incidents after the fact and revise (or not) how they organize risk It is agnostic about whether holistic, convergent accounts of risk incidents or local, partial and potentially contradictory accounts can serve as a basis for organizing risk It takes material affordances into account

TABLE 4: Insights into Risk Translations

	Organizational Risk Translations	Individualizing Risk Translations
What are the dynamics of risk translation?	The meaning of a particular risk object is translated into categories of organizational risk The result is risk proliferation: the original risk object becomes associated with multiple risks affecting diverse organizations	The meaning of a particular risk object is translated into categories of individual risk The result is risk individualization: the original risk object is shifted from an organizational responsibility to an individual one
Which discourses facilitate risk translation?	Intensification of the dominant discourse of risk	Intensification of discourses such as flexibilization, privatization and responsibilization
What are the implications for power relations?	Organizational power to act on risk is increased Risk translation is performative in enabling organizations to take action on risk, since they typically have routines in place to deal with the organizational risks that they translate Individuals may be able to pressure organizations to take action by translating risks for them	Organizational power over individuals in relation to risk is increased Risk translation is repressive in enabling organizations to gain power at the expense of individuals, and to reduce the likelihood of being held accountable for organizing risk Individuals become responsible for managing translated risks and subject to sanctions if they fail to do so
What are the implications for the risk cycle?	Organizations are more likely to engage with all modes in the risk cycle due to risk proliferation; and are more likely to have routines in place that enable them to do so	Individuals are more likely to take over responsibility for the prospective and real-time organizing of risk; while the organization usually keeps control of the retrospective mode.
Why is it important to study risk translations?	Given that grand challenges are associated with complex, systemic risks, research on risk translation may provide a way to learn more about how to engender organizational action on significant risks facing society	Given that risk is an important source of inequality in society, research on risk translation may provide a way to learn more about how to engender organizational action that addresses inequality in relation to risk

APPENDIX

TABLE A: Literature Providing Insight into Modes for Organizing Risk

Literature relevant to the prospective mode	Literature relevant to the real-time mode	Literature relevant to the retrospective mode
Risk analysis/perception	***Crises, disasters/accidents***	***Public inquiries***
Bromiley et al., 2015	Alexander, 2005	Ainsworth & Hardy, 2012
Fjeld et al., 2007	Ash & Smallman, 2008	Birkland, 2009
Jarzabkowski et al., 2015	Beamish, 2019	Boin, 2008
Leiss, 1996	Dosdall & Nichelmann, 2019	Brown, 2004
Lundgren & McMakin, 2018	Gephart et al., 2019	Burgess, 2011
Jagiello & Hills, 2018	Hällgren et al., 2018	Cullen, 2000
MacKenzie, 2005	Kaplan & Mikes, 2012	Elliott & McGuinness, 2002
Mikes, 2009, 2011	Leveson et al., 2009	Gephart, 1993
Miller, 2009	Perin, 2005	Hayes & Maslen, 2019
Millo & MacKenzie, 2009	Perrow, 1984	Hilgartner, 2007
NAS-NRC, 1983	Perry & Lindell, 2003	Hopkins 2008
Power, 2009	Power, 2016a	Huber & Scheytt, 2019
Sjöberg, 2006	Sauer, 2003	Hutter, 1992
Slovic, 2016	Williams et al., 2017	Newdick & Danbury, 2015
Society for Risk Analysis, 2018		Parker & Dekker, 2008
van Leeuwen & Vermeire, 2007	***Risk/crisis sensemaking***	Topal, 2009
Whittaker, 2015	Macrae, 2007	
	Macrae, 2014	***Organizational reviews***
Risk controversies	Maitlis & Christianson, 2014	Alves et al., 2019
Beamish, 2001	Weick, 1993; 2010	Catino & Patriotta, 2013
Boholm & Corvellec, 2011	Weick et al., 2005	Dechy et al., 2012
Borraz, 2007	Whiteman & Cooper, 2011	Dekker, 2002
Borraz et al., 2007	Winch & Maytorena, 2009	Dekker, 2015
Demortain, 2020		Douglas, 1992
Huault & Rainelli-Weiss, 2011	***Risk monitoring***	Hood, 2002
Jardine et al., 2007	Corvellec, 2009	Kendra, 2007
Leiss, 2001	Hall & Renuka, 2016	Luburic et al., 2015
Renn & Schweizer, 2009	Hood et al., 2001	Lupton & Warren, 2018
van Asselt & Vos, 2008	Jørgensen & Jordan, 2016	Madsen, 2009
Young & Liston, 2010	Mikes, 2016	McArdle et al., 2003
	Palermo, 2016	Palermo, 2016
Risk construction/risk discourse	Power, 2007	Power, 2009; 2019
Clarke & Short, 1993	Power et al., 2013	Roed-Larsen & Stoop, 2012
Corvellec, 2011		Ron, Lipshitz & Popper, 2006
Douglas, 1992		Rose, 2004
Douglas & Wildavsky, 1982		Sauer, 2003
Gephart et al., 2009		Stoop & Dekker, 2012
Hardy & Maguire, 2010, 2016, 2019		Waring, 2005
Hilgartner, 1992		
Jasanoff, 1998		
Klinke & Renn, 2002		
Lupton, 2013a		
Maguire & Hardy, 2006, 2013		
Mairal, 2008		
Malenfant, 2009		
Nyberg & Wright, 2015		
Palermo et al., 2017		
Power, 2004; 2007,		
Scheytt et al., 2006		
Wissman-Weber & Levy, 2018		
Zinn, 2008		

TABLE B: Literature Providing Insight into Perspectives on Organizing Risk

Literature relevant to Risk Culture	Literature relevant to Risk Work	Literature relevant to Risk Translations
Safety culture Barton & Sutcliffe, 2009 Boin & Schulman, 2008 Clarke, 2000 Cooper, 2000 Flin et al., 2009 Hoffman & Stetzer, 1998 Kim & Wang, 2009 Reason, 1997; 1998; 2000 Silbey, 2009 ***High reliability/resilient organizations*** Bierly & Spender, 1995 Bigley & Roberts, 2001 Busby, 2006 Christianson et al., 2011 Klein et al., 1995 Powley, 2009 Silbey, 2009 Van Der Vegt et al., 2015 Weick & Roberts, 1993 Weick et al., 1999 Williams et al., 2017 ***Risk culture*** Banks, 2012 Bozeman & Kingsley, 1998 Douglas, 1992 Douglas & Wildavsky, 1982 Hopkins, 1999 Lash, 2000 Palermo et al., 2017 Pan et al., 2017 Power, 2020 Power et al., 2013 Revet & Langumier, 2015	***Risk work*** Boholm, 2010 Boholm & Corvellec, 2011; 2016 Corvellec, 2009; 2010 Demontain, 2016; 2020 Fein & Isaacson, 2009 Fischer & McGivern, 2016 Gale et al., 2016 Hall & Fernando, 2016 Horlick-Jones, 2005 Jordan et al., 2013 Jørgensen & Jordan, 2016 Maguire & Hardy, 2016 Mikes, 2016 Palermo, 2016 Power, 2016a; 2016b Vargha, 2016 Vaughan, 2005	***Organizational risk translation*** Czarniawska, 2019 Hardy & Maguire, 2019 Maguire & Hardy, 2019 Power et al., 2009 ***Governmentality*** Ainsworth & Hardy, 2008 Binkley, 2009 Callaghan & Grundy, 2018 Curran, 2016 Centre for the Study of Risk Inequality, 2020 Davis, 2007 Doyle, 2007 Elliott, 2002 Ewald, 1991 Hacker, 2006 Hamilton, 2014 Neff, 2012 O'Malley, 2004 Rose, 2001 Stypinska, 2018 Vaz & Bruno, 2003 Watkins, 2017