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FROM BOUNCING BACK TO BOUNCING FORWARD: A TEMPORAL TRAJECTORY MODEL OF ORGANIZATIONAL RESILIENCE

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Resilience research has extensively addressed how organizations cope with disruptive events and their immediate impact. The focus of this research has been on how organizations "bounce back" to a pre-disruption state. However, organizations are also challenged to "bounce forward" toward unprecedented and uncertain futures in the wake of disruptive events without losing sight of their pasts. In this article, we develop a trajectory model of organizational resilience that focuses on how actors *project* temporal trajectories of responses toward disruptive events, *reconstitute* the trajectories in immediate response to the event, and *reconfigure* the trajectories toward the ensuing future. The model addresses the need to distinguish combinations of probability and the impact of disruptive events in organizational resilience research. We develop a typology of disruptive events from ecological research representing a distinct combination of probability and impact, labeled stochastic events, probabilistic transformations, and tipping points. We examine critical transitions in the trajectory model at which organizational resilience may or may not materialize. We conclude by considering the implications for theorizing organizational resilience between organizational levels and between different disruptive events, and for temporal organizational theorizing.

Organizations are increasingly confronted with exogenously generated disruptive events that cut across organizational levels unpredictably and create unprecedented futures for individual organizations and sometimes for entire organizational fields. Disruptive events can threaten organizational survival, particularly when caused by phenomena with temporalities that exceed those of organizations and magnitudes that might be difficult to imagine, let alone expect. A particular case is nature, which represents temporalities ranging from the imminent to thousands, and even millions, of years (Wolkovich, Cook, McLauchlan & Davies, 2014). Such events do not just impact single organizations, but may propel clusters of organizations as well as entire sectors in new and unanticipated directions (Bohn & Gümüsay, 2024). The effects of disruptive events can be far-reaching as they extend to organizations that are not directly exposed to them via global value chains, exposing many other organizations to disruptive events with varying degrees of impact.

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Disruptive events not only create unforeseeable futures in their wake but also force actors to draw novel connections between past and future events. That is the case because actors need to decide which operations, strategies, or solutions should be discontinued and which should be maintained toward the ensuing future. Failure to do so may disable an organization's ability to set a new direction toward that future (Christianson, 2019). Against this background, it seems puzzling that the vast majority of research on organizational resilience has focused on explaining how organizations "bounce back" (Raetze, Duchek, Maynard & Wolgemuth, 2022) toward a pre-disruption state (Boe-Lillegraven, Georgallis & Kolk, 2024; Hillmann & Guenther, 2021; Ponomarov & Holcomb, 2009; Roulet & Bothello, 2023; van der Vegt, Essens, Wahlström & George, 2015). With few exceptions (e.g., Boe-Lillegraven et al., 2024; Branzei & Fathallah, 2023; Ortiz-de-Mandojana & Bansal, 2016), research on organizational resilience has examined the immediate effects of disruptive events and how organizations return to "normal," leaving how organizations move into an uncertain future in the wake of such events underexamined.

By limiting analyses to how organizations navigate the immediate impact of disruptive events, scholars have downplayed the different ways in which disruptive events may unfold over time. The prevailing research approach has been to describe disruptive events in terms of the probability of occurrence and magnitude of impact. However, as shown by ecological research (e.g., Lenton et al., 2022), disruptive events may take different temporal forms, meaning that the probability of occurrence should be seen as evolving rather than being defined by crude measures. Moreover, the varying temporal forms of disruptive events invite reflections on their levels of organizational impact. While organizational resilience research has largely privileged operational disruptions in the form of sudden roadblocks or obstacles to organizational functioning, some events create disruption at strategic and systemic levels and force organizations to connect events to more distant pasts and futures. In conclusion, if we are to understand how organizations respond to disruptive events as varied as pandemics, climate-related disasters, and technological breakthroughs, we need to consider different ways in which probability and impact evolve through time.

In this paper, we develop a trajectory model of how organizations reconnect past and future events in response to disruptive events. The model offers a perspective of organizational resilience that is underpinned by a process lens of time (Blagoev, Hernes, Kunisch & Schultz, 2024; Hernes, 2022). This lens focuses on the processes through which actors maintain a sense of coherence between present, past, and future in the face of disruptive events. We develop the model against a typology of three distinct disruptive events identified from ecological research—stochastic events, probabilistic transformations, and tipping points. We discuss how organizations exercise resilience in response to each event type by *projecting* their trajectories toward disruptive events, *reconstituting* their current temporal trajectory in response to the event, and *reconfiguring* their trajectory toward the ensuing future. We further argue that the primary targets of projection, reconstitution, and reconfiguration differ depending on a disruption's primary organizational level of impact. That is, stochastic events require the recreation of operational trajectories, probabilistic transformations demand the recreation of strategic trajectories, and tipping points compel organizations to recreate the trajectories of the larger systems in which they are embedded.

Our paper makes three main contributions. First, aided by the distinctions between stochastic events, probabilistic transformations, and tipping points, our temporal trajectory model extends current resilience research by considering combinations of probability and the impact of disruptive events that have not yet been addressed in organizational research. This enables our theorization to cover a broader range of temporal forms of disruptive events than previously engaged in resilience research. Second, our ecology-based analysis enables us to understand organizational resilience concerning more complex combinations of environmental disruptions. Disruptive events involving different combinations of probability and impact have increasingly become the new normal for organizations. While research has primarily focused on singular events, such as the 9/11 terrorist attacks in 2001, it is essential to understand how multiple disruptive events connect through time. Third, our temporal trajectory model extends time-based theorizing in management by inviting reflections concerning how actors create and recreate present–past–future dynamics in response to disruptive events. Temporal theorizing has not contrasted the experienced nature of past events and the hypothetical nature of future events. Our theorizing invites reflections on how present–past–future dynamics are influenced by the challenge of connecting known past events with

radically uncertain future events along the same trajectory.

THEORETICAL BACKGROUND

In organizational research, resilience has most commonly been related to the ability to successfully navigate disruptive events (Boe-Lillegraven et al., 2024; Hillmann & Guenther, 2021; Ortiz-de-Mandojana & Bansal, 2016; Ponomarov & Holcomb, 2009; Roulet & Bothello, 2023; van der Vegt et al., 2015). The concept of resilience emerged in ecological studies (Folke, 2006; Holling, 1973, 1986) concerning how ecosystems continuously prepare for, cope with, and learn from disturbance and surprises. Holling's (1973: 14) definition of resilience—as the ability of systems to "absorb change and disturbance and still maintain the same relationships between populations or state variables"—inspired organizational resilience researchers to examine how organizations uphold and modify key processes in the wake of disruptive events (Williams, Gruber, Sutcliffe, Shepherd & Zhao, 2017).

To understand how organizations prepare for and recover from disruptive events, scholars have conceptualized resilience as a process that unfolds in three phases. In the *anticipation* phase (Vogus & Sutcliffe, 2007), organizations prepare by developing contingencies to ensure preparedness to handle disruptive events (Ponomarov & Holcomb, 2009) should they occur. This phase includes forward-looking processes such as scenario-based approaches (Winn, Kirchgeorg, Griffiths, Linnenluecke & Günther, 2011), foresight (Hillmann & Guenther, 2021), and environmental scanning (Boin, Comfort & Demchak, 2010; YahiaMarzouk & Jin, 2023). In the *adaptation* phase, organizations address the circumstances created by a disruptive event by maintaining the operation of some organizational structures and systems (Weick & Sutcliffe, 2015) to ensure continued performance. Finally, during the *recovery* phase, organizations try to return to a pre-event state of functioning (Hillmann & Guenther, 2021), or, ideally, to bounce back (Linnenluecke, 2017; Pérez-Nordtvedt & Harrison, 2025) as stronger and more resourceful (Williams et al., 2017).

Although resilience research has described phases of moving toward and beyond disruptive events, most analyses have primarily focused on the occurrence of the disruptive event and its immediate impact (usually at the operational level), after which the organization bounces back to a form that resembles the pre-event state (Raetze et al., 2022). For example, Hillmann and Guenther (2021) assert that organizational qualities such as buffering, efficacy, quick response, adaptive capacity, and dynamic capabilities may help organizations bounce back in the wake of disruptive events. However, resilience research has not specified what bouncing back may entail in the case of events of varying combinations of probability and impact, particularly when the impact of events extends beyond the operational level. In many cases, returning to a pre-event state is neither possible nor desirable. Some disruptive events may set entire systems onto a new path, meaning that organizations cannot bounce back and instead must bounce forward into a new and uncertain future while not losing sight of their past.

Drawing inspiration from the process lens on time (Blagoev et al., 2024), we posit that when confronted with disruptive events, organizations must bounce forward into the ensuing future. Bouncing forward does not imply losing sight of the past; on the contrary, it assumes that the past accompanies actors as they move toward a new future, but in a modified form. In this regard, organizations must recreate a new sense of direction between the past, present, and future (Feldman, Worline, Baker & Lowerson Bredow, 2022; Kaplan & Orlikowski, 2013) rather than bounce back to a pre-event state. From this perspective, disruptive events do not merely disrupt organizing processes, but also upset the coherence of actors' conceptions of their past, present, and future (Ortiz-de-Mandojana & Bansal, 2016), challenging them to redefine and reconnect events from the past to imagined or expected events in the future following a disruptive event. Disruptions such as climate-related events sometimes upend taken-for-granted coherence between past events while imposing a future that differs radically from what actors imagined it would be. The attempt to explain how organizations recreate a sense of coherence between events invites a focus on temporal trajectories.

Organizational scholars have increasingly drawn on the trajectory concept to explain how actors develop a sense of direction through time by connecting events (e.g., Cloutier & Ravasi, 2020; Danner-Schröder, 2020; Morgeson, Mitchell & Liu, 2015; Kaplan & Orlikowski, 2013; Pérez-Nordtvedt & Harrison, 2025). While much of the literature has considered trajectories to be accomplished patterns of events through time, some scholars have recently defined trajectories as emergent phenomena (e.g., Hernes, 2017; Williams & Shepherd, 2021). For example, Williams and Shepherd (2021) use the trajectory concept to explain how local communities and organizations co-constructed new emergent

trajectories of reconstruction ("Build Back Better") in the aftermath of the 2010 Haiti earthquake. Consistent with a process lens (Blagoev et al., 2024), we understand temporal trajectories as emergent phenomena that are created and recreated through ongoing processes of connecting past and future events (Danner-Schröder, 2020; Reinecke & Lawrence, 2022). Applied to resilience, this perspective enables us to analyze how disruptive events confront actors with the challenge of *recreating* temporal trajectories by considering alternative connections between past and future events through ongoing processes.

We focus on two main features of temporal trajectories. First, temporal trajectories are described by their directionality (Hernes & Feuls, 2024) and defined as mutual coherence (Kaplan & Orlikowski, 2013) between selected events through time. Coherence should not be confused with consistency; while consistency implies a degree of sameness, coherence may include tensions, contrasts, or opposition. Actors may sometimes have to recreate the temporal trajectory in response to disruptive events by connecting events that represent a different sense of coherence—and, hence, direction—through time. For example, one study shows how reintroducing ancient methods of using clay in house construction that are inconsistent with modern housing standards can be a viable future technology in several regions of the world (Giyasov, Barotov & Naimov, 2019). In this way, evoking the past (Schultz & Hernes, 2013) may help form a future that does not resemble the present at all, yet is still coherent (Kaplan & Orlikowski, 2013) with the overall trajectory.

Second, trajectories have been described by how *far* back or forward in time actors deem events to be significant, which is referred to as temporal depth and defined by Bluedorn (2002: 114) as the distance into the past and future that actors "typically consider when contemplating events that have happened, may have happened, or may happen." Bluedorn's definition brings attention to the temporal range from which actors select events for consideration when faced with disruptive events. According to organizational time scholars, when faced with crises, organizations must search their (sometimes distant) pasts for events, solutions, or experiences that can be translated into a novel future (Hernes & Schultz, 2020; Suddaby, Israelsen, Mitchell & Lim, 2023). This in no way suggests a repetition of the past, but rather indicates that "history doubles back [such that] the developments involved are not reverses, but advances toward new states of affairs" (Miller, Gomes & Lehman, 2019: 2).

A TEMPORAL TRAJECTORY MODEL OF RESILIENCE

While resilience research considers the three phases (anticipation, adaptation, and recovery) to be sequentially ordered and separate from one another, we propose a temporal trajectory model considering the temporal depth of past and future events that spans the three phases as actors move through a trajectory from beginning to end. Our process-based model is premised in the idea that in a later phase, actors may search back into a previous phase for ways to move forward; conversely, they may use future imagined solutions to shape the processes of a current phase. This approach perceives resilience as a process that unfolds *through* time and not simply *over* time, which is a view that resilience theory has yet to engage with in depth (Branzei & Fathallah, 2023). Table 1 summarizes the trajectory model, which is further elaborated below in terms of the three phases of projecting, reconstituting, and reconfiguring trajectories.

Projecting Temporal Trajectories toward Disruptive Events

In the first phase, trajectory *projecting* replaces what resilience scholars have called anticipation of events (Boe-Lillegraven et al., 2024; Hillmann & Guenther, 2021; Linnenluecke, 2017; Williams et al., 2017). While dominant resilience perspectives limit the focus to how actors anticipate responses to a singular event, a trajectory view assumes that actors project a trajectory of responses toward and beyond disruptive events. Examples of response trajectories are found in the literature on multiple-scenario development. For instance, Schoemaker (1993) details a list of 10 interconnected processes in scenario construction that would constitute a trajectory of responses. Projecting entails the "imaginative generation by actors of possible future trajectories of action" (Emirbayer & Mische, 1998: 971) toward and beyond disruptive events. Projecting implies that actors predominantly consider a forward-looking temporal depth. The temporal depth of projecting may vary from including the occurrence of the disruptive event to considering the ensuing future beyond the event.

We expect that various combinations of probability and impact influence how organizations project resilience trajectories. When actors imagine possible trajectories toward lower-impact events, they primarily focus on how their projected responses will enable them to cope with the immediate

TABLE 1
A Temporal Trajectory Model of Organizational Resilience

Phase	Projecting Temporal Trajectories (before the Disruptive Event)	Reconstituting Temporal Trajectories (during the Disruptive Event)	Reconfiguring Temporal Trajectories (in the Wake of the Disruptive Event)
Description of phases and processes	Processes to plan or imagine trajectories of responses to disruptive events.	Processes to recombine projected responses in temporal trajectories to tackle the immediate consequences of such events.	Processes to select and combine responses that can form a basis for a new direction into the ensuing future.
Temporal depth considered	Between the present and the eventual future occurrence of disruptive events and their immediate consequences.	Between projected measures along the trajectory and the perceived end of the disruptive event.	Between the organization's past and events in the ensuing future.

consequences of the event, as they will, in most cases, assume that the ensuing future may not be radically different. For example, Herbane (2019) demonstrates how small and medium-sized enterprises that integrated events faced by other companies into their plans were able to better cope with disruptive events than companies that did not, implying that preparedness for the event and the immediate aftermath may be sufficient for low-impact events. On the other hand, higher-impact events imply more uncertain futures after the disruptive event and demand that organizations anticipate responses to futures that may be very different from what they have experienced in the past. Futures ensuing from high-impact events may include radically new technologies that demand new skills, or different interfaces between technology and humans, such as the use of artificial intelligence (AI) for decision-making (Murray, Rhymer & Sirmon, 2021).

Reconstituting Temporal Trajectories during Disruptive Events

In the second phase, the model suggests that actors *reconstitute* the existing temporal trajectory during the disruptive event. As shown by several resilience scholars, disruptive events pose an immediate threat to continued organizational functioning (Boe-Lillegraven et al., 2024; Pearson & Clair, 1998; Williams et al., 2017). While current resilience research has focused on maintaining ongoing operations, a trajectory view focuses on how actors adapt the temporal trajectory to the new situation. We use the term reconstituting to describe how actors reorganize resources (Weick & Sutcliffe, 2015) by recombining projected responses in their temporal trajectory to tackle the immediate consequences of such events. They do so by exploring ways in which to orient different combinations of responses toward the emerging situation—for example, by improvising responses with "flexible use of the past in the light of the present" (Boe-Lillegraven et al., 2024: 328). We expect such processes to span a limited temporal depth into the past and future, as actors have limited time to restore organizational functioning. A case in point is the recent collapse of the Francis Scott Key Bridge in the U.S. city of Baltimore, Maryland, due to a collision with a cargo ship, which caused the immediate closure of the Port of Baltimore. The bridge's collapse was expected to affect not just the U.S. northeast's economy, but possibly the global economy. Still, according to news reports, authorities had only days or weeks to exploit existing approaches to facilitate transportation to and from the port (*Guardian*, 2024).

Reconstituting temporal trajectories may demand different processes depending on the combination of probability and the impact of the disruptive event. Danner-Schröder's (2020) study of the aftermath of the Great East Japan Earthquake detailed how residents reached back in time to reconstitute their trajectories during the recovery phase, and used various artifacts to help them evoke events from before the earthquake. Whereas, in this case, people focused the reconstitution of trajectories on recreating a similar existence to what they had before the earthquake, in the case of high-impact events where the future becomes radically different from the past, reconstitution may take a different form. In some cases, organizations are thrown into disarray because their existing trajectory fails to capture the nature and impact of a disruptive event (Boe-Lillegraven et al., 2024) and does not fit the new

future (Pérez-Nordtvedt, Shin & Lee, 2023), offering little foundation for moving into the ensuing future. In such cases, reconstituting the trajectory will aim to enable organizational functioning during the disruptive event while the organization prepares for further changes in anticipation of the ensuing future.

Reconfiguring Temporal Trajectories in the Wake of Disruptive Events

In the third phase, the model suggests that actors *reconfigure* the temporal trajectory by reorienting it in response to the unprecedented futures emerging from the disruptive event. While reconfiguration holds different meanings in organizational theorizing (see, e.g., Furnari, Crilly, Misangyi, Greckhamer, Fiss & Aguilera, 2021), we follow Hernes and Obstfeld's (2022) view of temporal (re)configuration as the selective weaving together of past events in the face of novel futures.[1] From this perspective, reconfiguring entails searching retrospectively into the organization's past to select and combine responses that can form a basis for a new directionality into the ensuing future after the disruptive event. Whereas reconstituting relies on recombining responses from existing trajectories, we assume that reconfiguring occurs over a greater temporal depth into the organization's past to include a broader spectrum of responses. Reconfiguring temporal trajectories entails a creative search (Emirbayer & Mische, 1998) into the organization's distant past to connect responses with plausible events in the ensuing more distant future.

For example, a severe hurricane might disrupt the direction of the trajectory to the extent that it destroys the material infrastructure inherited from the past that would have typically provided a foundation for moving toward the future (Feldman et al., 2022). At the same time, such events may create opportunities for actors to establish new directions for the more distant future, such as by building new infrastructure with new materials. However, recreating a direction toward the ensuing future may require modifying alliances from the past or refining past technologies through new research and development activities. In some cases, reconfiguring may span large temporal depths. For example, the occurrence of an extreme weather event might inspire local actors to revive past building techniques and materials to meet similar weather events in the future. Reconfiguring temporal trajectories could be particularly challenging for actors who have not developed foundational knowledge or capabilities in the past. Hence, the need to explore the more distant past to identify potential trajectories from a broader range of events that can be used to imagine a radically different future.

ORGANIZATIONAL RESILIENCE IN RESPONSE TO THREE TYPES OF DISRUPTIVE EVENTS

A temporal trajectory model of organizational resilience should be based on distinct types of disruptive events that represent the widest possible variety of combinations of probability and impact that organizations may be expected to confront. However, current resilience research has left how probability and impact may unfold differently over time unexamined. Instead, resilience scholars have referred to low probability and high impact in general terms, such as low-probability events as exceptional, surprising (Williams et al., 2017), random, or rare (Erol, Sauser & Mansouri, 2010); and disruptive events as devastating (Williams et al., 2017) or destructive (Boin et al., 2010).

We draw on the social-ecology literature (e.g., Folke, 2006; Holling, 2001) to propose a typology of combinations of probability and impact. The social-ecology literature includes studies of phenomena with temporalities that greatly exceed organizations, and therefore offers combinations of probability and impact that are not readily found in organizational research. For example, climate change may move slowly for hundreds or thousands of years, then accelerate within a short period to disrupt organizations, just as extreme weather events may occur suddenly without any warning (Zscheischler et al., 2020). We next discuss how organizations exercise resilience in response to three distinct types of disruptive events derived from the ecology literature, labeling these types *stochastic events, probabilistic transformations,* and *tipping points*.[2] These three

[1] Hernes and Obstfeld (2022) draw on Ricoeur's (1984) work on time and narrative in which (re)configuration of time plays a key role for understanding the situated dynamics by which actors move through time.

[2] Our typology is not meant to be exhaustive, but to be representative of the widest plausible range of combinations of probability and impact that organizations may confront. The configuration of the types corresponds to recent reviews of extreme weather and climate event typologies. For example, Zscheischler et al. (2020) propose a typology of four different compound weather and climate events that reflects the typology used in this paper.

TABLE 2
Temporal Trajectories and Three Disruptive Event Types

Type of Disruptive Event	Probability	Level of Impact	Projecting Temporal Trajectories	Reconstituting Temporal Trajectories	Reconfiguring Temporal Trajectories
Stochastic events	Unpredictable and sudden	Operational; for example, interruption of routines	Develop contingencies and conjectures to respond to stochastic events	Reassemble operations to meet the challenges of the immediate future	Redefine the conjectures for the ensuing future
Probabilistic transformations	Plausible and emerging	Strategic; for example, disruption of planned solutions	Develop solutions and strategic narratives for probabilistic transformations	Recombine solutions for the new realities	Realign the strategic narrative with the ensuing future
Tipping points	Unexpected and accelerating	System-wide, encompassing actors, relations, and governance structures	Develop field-level innovation and socio-material imaginaries to prepare for systemic change	Harness field-level innovations to counter the immediate impact of the event	Translate socio-material imaginaries for the ensuing future

types of disruptive events exhibit different combinations of probability and impact (Table 2). In what follows, we discuss how temporal trajectories may be used to describe organizational resilience in response to these three types of disruptive events identified in the ecology literature. Figure 1 illustrates the three types of disruptive events, focused on the differences in probability and impact across time.

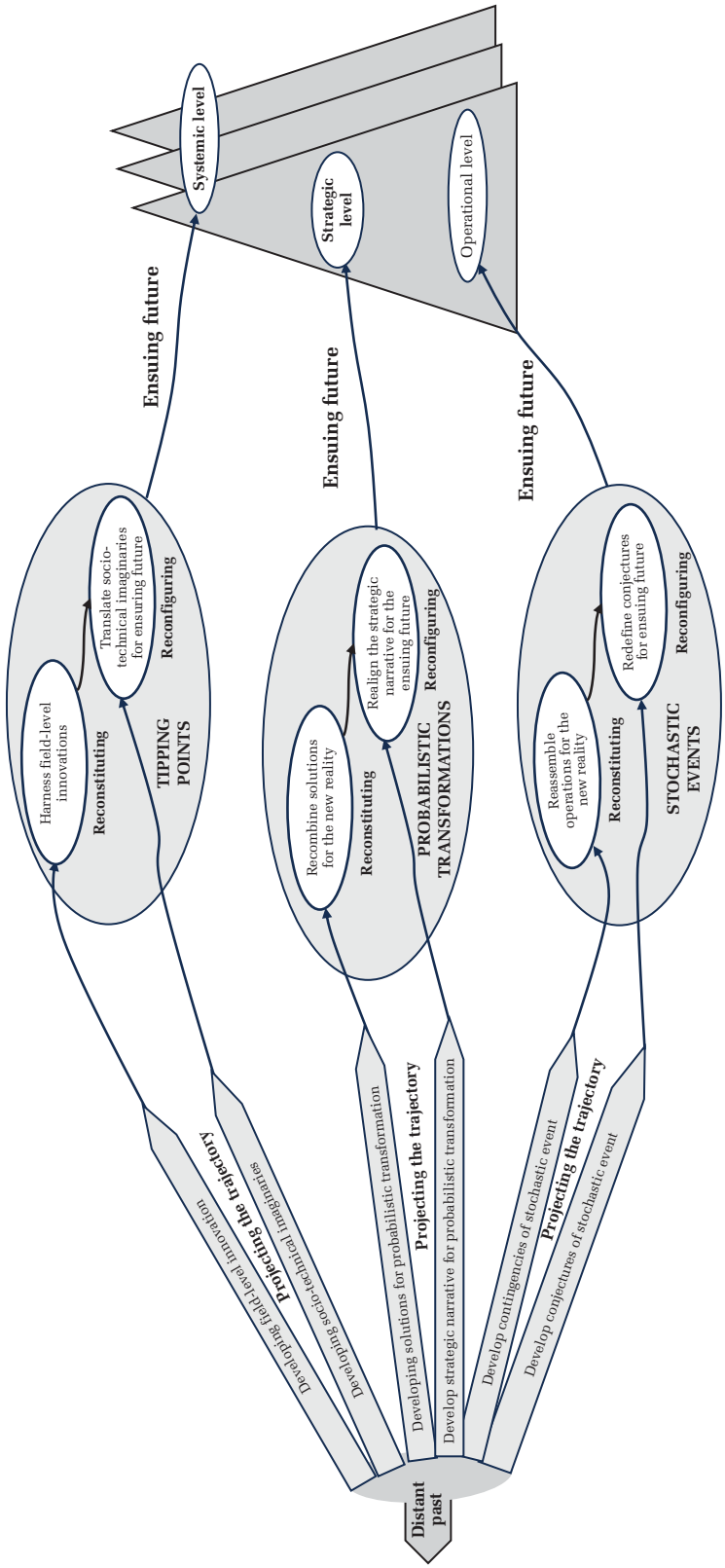
Organizational Resilience in Response to Stochastic Events

Stochastic events in the natural environment include sudden events that result from naturally disruptive variations and consequences of human intervention (Light, Gunderson & Holling, 1995). Although they must reckon with the events' occurrence (Boe-Lillegraven et al., 2024), organizations cannot predict when and where stochastic events (e.g., climate disasters) may occur, the form they will take, or the eventual consequences (Clarke, 2008). Clarke (2008: 676) refers to such approaches as possibilistic (as opposed to probabilistic), providing an illustrative example: "A possibilistic approach acknowledges a civilian nuclear power plant is unlikely to melt down, but [still explores] what happens if a plant has a particularly bad day." For example, in the natural environment, stochastic events can take the form of extreme weather events, defined as situations in which a local weather variable exceeds a certain threshold or when multiple variables combine to produce extreme conditions (Linnenluecke, Griffiths & Winn, 2012). Stochastic events can also result from unusual combinations of foreseeable events. For example, in May 2024 a ferocious windstorm hit Houston, Texas at more than 100 miles per hour and caused loss of electricity in almost a million households. However, had the same storm hit several days later, with temperatures roaring at almost 100 degrees, the impact could have caused thousands, if not tens of thousands, of deaths from heat exposure in a matter of days (Goodell, 2024).

Projecting temporal trajectories toward stochastic events. Although stochastic events are unpredictable by definition, organizations can draw on various processes to develop a degree of organizational resilience to their possible occurrence (Huiskamp, ten Brinke & Kramer, 2022). Such processes assume that organizations must reckon with the occurrence of stochastic events, although they cannot predict their timing, form, or impact. They also aim to minimize the long-term impact of stochastic events by widening the space of possible directions in the ensuing future.

The first set of processes that give direction to the projecting of temporal trajectories involves the preparation of responses to possible events that can be quickly drawn upon if an event occurs. This includes developing operational *contingencies* that follow an "if–then" logic (Sánchez & De Batista, 2023), such as plans to access alternative energy sources and make them operable with existing technologies. A common assumption about stochastic events is that they disrupt organizations' operational

FIGURE 1
Temporal Trajectory Model of Organizational Resilience



direction first and foremost. Organizations that regularly face unexpected situations, such as those focused on firefighting, continuously train members on implementing alternative processes when faced with contingencies (Geiger, Danner-Schröder & Kremser, 2021). Crisis research has offered multiple examples of how organizations further removed from the direct consequences of environmental events develop resilience in areas such as supply chains (e.g., Sánchez & De Batista, 2023). Without functioning supply chains, most organizations face collapse because they will be unable to continue operating long enough to respond to disruptive events successfully. Therefore, as Ponomarov and Holcomb (2009) argue, some companies actively develop logistics processes and systems to be activated as contingencies at stochastic events so that the organization can continue to function operationally when such events occur.

A second set of processes is *conjectural*, and addresses the eventual impact of stochastic events. Preparing for such events demands that actors produce conjectures to prepare for the aftermath of events (Williams et al., 2017). A conjecture is an inference from the contingencies about what may happen as a consequence of a disruptive event. Conjectures form around an "if–could" logic, asking, if such contingencies occur, what could be the consequences? Such processes aim to enable hypothetical events and implied directions to come alive in actors' minds as they collectively engage in scenario development (Wack, 1985a, 1985b). Conjecturing enables actors to envision the context of stochastic events and imagine possible responses in their aftermath. Wack (1985a, 1985b), whose analysis of scenario planning is a case in point, argues that actors need to think beyond the immediate operational disruption of stochastic events and prepare for broader implications, such as policy and price changes. When such events occur, conjectural processes also enable actors to recognize the nature of the new situation and reorient the trajectory toward the immediate future.

Reconstituting temporal trajectories during stochastic events. Stochastic events are rare, but can potentially be devastating if processes that are vital for continued organizational functioning are severely disrupted (Boin et al., 2010). In terms of impact, stochastic events primarily disrupt the sense of direction of the organization's operations. In such situations, organizational environments are experienced as loosely coupled, and decision-making processes may be fragmented and erratic (Lanzara, 1983). When operations are disrupted by stochastic events, actors are faced with the need to reconstitute existing temporal trajectories to uphold operations in a quickly changing situation (Weick & Sutcliffe, 2015). Given the uniqueness of stochastic events, contingency plans are unlikely to be executed as originally conceived. For example, operational breakdowns of the magnitude associated with extreme weather events create considerable uncertainty about which parts to retain, change, or jettison from the existing trajectory. As stochastic events impose limitations on the organization's resources, it is reasonable to expect actors to *reassemble* established operations rather than reinvent them during the event (Ortiz-de-Mandojana & Bansal, 2016). Reassembling operations enables organizations to meet the challenges of the new reality. For example, in their study of health care after Hurricane Katrina, Feldman et al. (2022) illustrated how actors immediately sought to reestablish their interrupted trajectories so as to be able to pursue their lives following the event.

Reconfiguring temporal trajectories in the wake of stochastic events. Given that an organization can continue to function, albeit in "some degraded form" (Weick & Sutcliffe, 2015: 96), during stochastic events, the next step in our model is to reconfigure the trajectory toward the operational demands of the ensuing future. Stochastic events sometimes create an unforeseeable future for organizations, particularly when the temporal trajectories of multiple interconnected organizations are affected, which can trigger radical shifts in technologies or organizational relations (Oborn, Barrett, Orlikowski & Kim, 2019). As noted above, because stochastic events are unpredictable by definition, their eventual impact may be very different from what may have been anticipated. Still, organizations have no choice but to recreate their trajectories toward the ensuing future based on the reconfigured temporal trajectory.

While the reconstitution of temporal trajectories often draws on operational contingencies that were developed before stochastic events, reconfiguration is more likely to rely on conjectural processes during the projecting phase as conjectural processes aim to address the realities that emerge following the event. For instance, more exploratory scenarios are likely to be helpful when reconfiguring a new direction into the ensuing future. Börjeson, Höjer, Dreborg, Ekvall, and Finnveden (2006) describe exploratory scenarios as normative (as opposed to predictive), arguing that they apply to longer time horizons and profound changes. This implies that exploratory scenarios apply to lesser-known and more disruptive

futures such as those engendered by stochastic events.

Organizations are sometimes forced to explore new directions into the ensuing future because stochastic events might physically destroy the material infrastructure necessary for continued organizational functioning (Feldman et al., 2022). When such infrastructure is damaged, the ensuing future may demand novel and radically different operational technologies and routines, and although conjectures were developed for a stochastic event, they may only partially apply to the ensuing future. Hence, an important element of reconfiguring trajectories in response to stochastic events is *redefining* conjectures, which demands that actors revisit the basis for past conjectures to create a better fit for the ensuing future. For example, Kougkoulos, Merad, Cook, and Andredakis (2021) analyzed precedents and consequences of unprecedented and sudden floods in the French village of Saint-Martin-Vésubie that occurred in October 2020. While emergency services were able to evacuate villagers and restore a sense of order, the flash floods overpowered the preparatory measures in place, including prevention plans, warning systems, and maximum threshold for emergency calls. As a result, the French Ministry of Ecological Transition suggested holding an action week in which all past events could be discussed between major stakeholders, which meant going back 30 years in time. Based on their analysis, the authors suggested how authorities should reassess the processes of preparing for extreme weather events in view of the increasing concentration of urban centers combined with the changing patterns of hazard behavior (Kougkoulos et al., 2021: 1972). Consequently, the existing process of preparing for such events, extending decades into the past, would be substantially changed, integrating routines and practices for the actors responsible for risk prevention, emergency management, and disaster recovery.

Organizational Resilience in Response to Probabilistic Transformations

Probabilistic transformations are disruptive events whose probability and impact actors try to influence strategically. Organizations may not be able to prevent a certain transformation from occurring, but they can strategically prepare by considering it more, or less, probable and mitigate its impact (Boin et al., 2010). Probabilistic transformations such as the transition to green energy represent considerable impact, particularly when they entail new ways of living, working, and organizing (Huang, Kerstein, Wang & Wu, 2022; Lê, 2013), and actors may influence the probability of such transformations occurring while orienting themselves toward the ensuing future. For example, the contemporary automotive industry is facing a probabilistic transformation toward a future of carbon-free mobility. Although many details of this future remain unknown, some of its cornerstones are currently being defined as automotive firms embrace trends such as electrification, car-sharing, self-driving cars, and connectivity. In other words, they are taking part in shaping the future forms of mobility that are collectively perceived as desirable (Gümüsay & Reinecke, 2022; Rindova & Martins, 2022).

Probabilistic transformations require organizations to imagine strategic trajectories toward futures that may be at odds with the current strategies being pursued, which creates a sense of disruption when such transformations occur. For example, an automotive firm facing the probabilistic transformations toward carbon-free mobility may imagine a future as a sustainable mobility provider that might no longer be producing or selling cars. Creating coherence between such a radically different future and the organizational present or past is the core temporal challenge of probabilistic transformations, as developing solutions for a future not yet in existence is a costly, uncertain, and time-consuming process for organizations that are compelled to experiment proactively with alternative solutions while continuing to pursue existing approaches (Feuls, Hernes & Schultz, 2024).

Projecting temporal trajectories toward probabilistic transformations. In terms of projection, organizations may employ two types of processes toward probabilistic transformations. First, they may develop solutions that could plausibly influence the probability of disruptive events and accommodate their impact. For example, in an analysis of how Arla, a Danish dairy company, developed packaging solutions for a carbon-free future, Feuls et al. (2024) demonstrate how sustainable packaging managers and technologists examined a variety of solutions that did not exist yet but could be parts of potential future trajectories. Managers and technologists engaged in collaborative processes to obtain a qualitative understanding of possible future actors and solutions, and performed calculations to compare the quantitative and qualitative aspects of the potential solutions. Calculations helped them envisage ways to scale up alternative future solutions for domestic and international markets while pursuing

their current strategies. Hence, investing in solutions for future transformations is a key aspect of projecting trajectories toward probabilistic transformations while preserving or developing strategic advantages.

A second form of projection involves the development of strategic narratives for the ensuing future. Probabilistic transformations invite new actors into the field who can offer novel solutions and technologies that are consequential for the further development of strategies. Although a company may have developed novel solutions in anticipation of a probabilistic transformation, it may not be able to predict the roles it is likely to play in the transformed environment. Therefore, actors need to develop strategic narratives that function as "persuasive vehicles that shape beliefs about possible futures and firms' potential roles in them" (Rindova & Martins, 2022: 200). Narratives are important for strategy development under uncertainty as they enable strategic conceptions between the actual and the possible; between the reconfiguration of resources and the pursuit of opportunities. Because probabilistic transformations require long-term resource investment, narratives should be developed to help identify new directions into the future from a broader slate than previously considered. Narratives also help establish trajectories through time by connecting imagined future directions to present-day actions, such as leveraging existing organizational capabilities (Rindova & Martins, 2022: 210).

Reconstituting temporal trajectories during probabilistic transformations. Even when they enact solutions toward a probabilistic future, organizations are confronted with the need to fit those solutions into the new reality after disruptive events occur. Different actors may hedge their bets on similar solutions while basing their strategies on different relations, actors, and technologies. The development of wind turbines and solar panels are examples of similar technologies that are pursued by competing alliances and networks in different regions in preparation for replacing fossil-based energy sources. Such circumstances create new environments with different opportunities and constraints, compelling organizations to *recombine* solutions. By recombining solutions for the new reality, organizations can retain the ability to innovate to take advantage of the new situation (Sánchez & De Batista, 2023) and become part of emerging networks and partnerships. For example, Kühn and Klaus (2013) describe how, once probabilistic transformations in the German wind energy field began to take hold, companies began to address the technological features of turbines developed in the past, such as the pitch and velocity of rotor blades. It was also important to address emerging constraints and opportunities such as novel ways to organize grids, including pricing mechanisms and energy storage solutions. The authors assert that the new generation of turbines can be integrated into grids based on technological innovations that enabled new blade and rotor configurations.

Reconstituting temporal trajectories during probabilistic transformations might also require organizations to create structural arrangements that enable them to pursue multiple trajectories simultaneously. For example, Bohn and Gümüsay (2024: 217) show how some former regional monopolists in the German energy market approached the probabilistic transformations toward renewable energy by "split[ing] up into two entities—one with a focus on the old fossil fuels and nuclear power plants and one concentrating on renewable energies." Such restructuring became acutely necessary as energy firms were compelled to reconstitute their existing trajectories following the 2011 Fukushima meltdown. In the aftermath of the meltdown, the German parliament resolved to phase out nuclear energy, immediately shutting down eight nuclear power plants and setting a 10-year horizon for shutting down the remaining nine. Hence, organizations faced the challenge of quickly reconstituting their temporal trajectories by prioritizing the transition toward renewable energy while deemphasizing—but not fully discontinuing—existing nuclear and fossil-fuel trajectories.

Reconfiguring temporal trajectories in the wake of probabilistic transformations. In addition to reconstituting temporal trajectories during probabilistic transformations, organizations are faced with the challenge of developing novel strategic directions for the ensuing future. Although strategic narratives may have been developed concerning impending probabilistic transformations, actors must *realign* their strategies toward the ensuing future to enable replication and upscaling (Cohen-Shacham, Walters, Janzen & Maginnis, 2016). For example, electric vehicles might have been projected as a possible trajectory into a sustainable mobility future, but scaling their production can create new problems in the natural environment, including an overreliance on rare earths.

The occurrence of strategic disruptions can sometimes trigger a retrospective search into previously developed strategies to reconfigure the current strategy in response to a probabilistic transformation. Reconfiguring the current strategy in response to an

event may take the form of strategy restoration, which Miller et al. (2019: 5) define as the "current creative reenactment of an historical strategy with a view toward an imagined future." The imagined future corresponds to the ensuing future in the wake of the disruptive event in our model, which may force the organization to search the foundations of its intended strategy leading up to a probabilistic transformation. The resulting strategy for the ensuing future may then be a fusion of previous and current strategies. For example, Feddersen, Koll, and Geraldi (2023) show how energy company Ørsted (formerly DONG Energy) began to expand offshore wind farms in the late 2010s. When the transition to offshore wind energy began to gain momentum, the company evoked its previous experimentation with Vindeby, the world's first offshore wind farm, two decades earlier. These processes enabled the company to redefine and recombine past strategies for the future with ongoing processes of defining events of the reconfigured trajectory toward the ensuing future. Reconfiguring past strategies may be effortful, as noted by the authors, as even the same past events were interpreted differently and hence presented multiple ways of reconfiguring the trajectory toward the ensuing future.

Organizational Resilience in Response to Tipping Points

Tipping points belong to what Boin et al. (2010) call transboundary threats, which we associate with the interorganizational level that is impacted by disruptions in the ecosystem in which the organization operates. As defined in ecological research, tipping points mark an accelerating shift in ecosystems toward a state from which reversal is difficult, if not impossible (Ferraro, Etzion & Gehman, 2015). The systemic nature of tipping points corresponds to what Winn and colleagues (2011: 157) called "massive discontinuous change," which unfolds through unprecedented mutual interaction between natural, social, and socio-ecological systems (Holling, 2001). Although tipping points have been associated with temperature thresholds in the distant future, the world is already beginning to experience their effects (Carrington, 2022; Rockström et al., 2009), such as the melting of Alpine glaciers and methane-rich permafrost (Wright, Nyberg, Rickards & Freund, 2018).

The accelerating probability combined with the systemic (and interorganizational rather than organizational) impact of tipping points may escape most organizations. In an article entitled "Like the flip of a switch, it's gone," Greene (2024) describes how the sudden disappearance of a species of fly from the United Kingdom's largest lake, which supplies more than 40% of Northern Ireland's drinking water, could be an ominous sign that the ecosystem of the lake is collapsing. Representing "disasters in slow motion" (Hansen, 2023) that are prone to rapid acceleration, tipping points can have an intractable long-term impact on organizational trajectories. The consequences of tipping points may be dramatic and seriously threaten organizations' efforts to recreate their temporal trajectories to move toward an ensuing future that bears little to no resemblance to the present. The major challenge in such circumstances is to recreate an organizational trajectory with entirely new directions that may involve abandoning previous solutions or technologies and conceiving radically new ones for the future.

Projecting temporal trajectories toward tipping points. Analyzing how organizations respond to ecological tipping points is challenging because evidence is currently scarce. Still, tipping points in ecology are systemic (Winn et al., 2011), meaning that they trigger processes that transcend individual organizations as well as clusters or sectors of organizations. Global value chains connecting organizations worldwide around, for example, food, energy, and precious metals expose many organizations to the potential impact of tipping points. The accelerating systemic changes associated with tipping points demand that sustainable technologies and solutions are propagated between societies and organizations to set actors on a new and sustained course of action into the ensuing future. Given the systemic impact of tipping points, organizations aim to develop *field-level innovation* to conceive technologies and solutions for a world that does not yet exist.

Such widespread adoption is not accomplished overnight, but demands the concretization of imaginaries among actors in society more broadly (Augustine, Soderstrom, Milner & Weber, 2019). Lenton et al. (2022: 8) argue that (negative) environmental tipping points should be mitigated by innovation-driven "upward scaling cascades" that occur in sectors such as agriculture, energy, transport, and lighting. For example, the Great Green Wall project in the Sahel desert, which is driven by thousands of coordinated minor agricultural and forestry initiatives, has already restored 20 million hectares of land for agricultural use (Bruckmann, Chotte, Duponnois, Loireau & Sultan, 2022). Another example is from the study of German and

Greek agriculture by Chatzimichael, Genius, and Tzouvelekas (2014), who show how organic farming became more widely shared through an "upward cascading" process of accelerated adoption through informational networking. Upward-scaling cascades necessitate the development of innovations that activate feedback between different parts of the sociomaterial system that can be amplified throughout societies and sectors. From this perspective, aspects such as critical mass, diffusion of innovations, and social contagion (Lenton et al., 2022) become critical for triggering "upward-scaling tipping cascades" (Sharpe & Lenton, 2021: 421) to mitigate the consequences of crossing environmental tipping points.

A second type of process to project temporal trajectories toward tipping points involves what Flyverbom and Garsten (2021) call *socio-material imaginaries.* This implies imagining possible futures through the lens of what Augustine et al. (2019) called "as-if realities" that do not correspond to a known past or baseline but consider an imagined hypothetical state of the world (Beckert, 2016) that is sufficiently compelling to motivate action. Engaging with as-if realities enables actors to imagine and work toward novel future directions that fundamentally differ from the past and present. For example, Turrell (2023) reports how companies in the United States, Finland, Denmark, and Austria are working to develop technologies for extracting protein for human consumption from carbon dioxide (CO_2). Such technologies aim for systemic change to transform food habits as society prepares for the advent of nutrition that bypasses traditional agriculture. For such technologies to become viable solutions, actors depend on interorganizational collaboration for finance, research, expertise, and institutional support, as some solutions will require regulatory measures to be viable. Such processes would address the broader implications of a future world in which systemic relations are transformed and baselines are radically changed (Alagona, Sandlos & Wiersma, 2012; Hirsch, 2020). In a large-scale ethnographic study, Hirsch (2020) observes that activities to restore the Columbia River Basin involved imaginaries of a future with different baselines than had been previously applied. In this case, new baselines were defined using imaginaries of irreversible change that involved factors such as environmental protection, tribal treaty rights, and environmental justice (Hirsch, 2020: 45).

Reconstituting temporal trajectories during tipping points. The accelerated change near tipping points renders the development of new technologies and solutions challenging because organizations lack the necessary time to develop and scale up solutions. The sweeping nature of tipping points, combined with the urgency of reconstituting temporal trajectories, indicates that organizations must rely on existing field-level innovation processes to move into the new reality. Because tipping points have systemic impact, organizations are challenged to coordinate field-wide innovation processes toward specific objectives (Watson, Wilson, Smart & Macdonald, 2018). Actors will have likely engaged in multiple trajectories of innovation across which they need to identify synergies to leverage momentum (Oborn et al., 2019) and *harness* innovative efforts (Watson et al., 2018) to counter the immediate impact of a tipping point. For example, Guthey and Whiteman (2009) describe how wine industry entrepreneurs in California prepared for a more sustainable agricultural economy amid environmental restoration efforts following decades of unsustainable farming. Wineries updated traditional winemaking processes by innovating methods and technologies to ensure compatibility with an emerging future of sustainable winemaking, while integrating additional parts of the ecosystem into the developing vineyards. The wineries consequently became instrumental in building resilience into the local ecosystem, where tipping points prompted changed regulations related to soil health, watersheds, fish-friendly farming, and pesticides, to name but a few. These approaches subsequently led to system-wide change in the broader winemaking ecosystem in California.

Reconfiguring temporal trajectories in the wake of tipping points. Having reconstituted existing temporal trajectories, actors must confront a new future in a systemically disrupted environment. Although the empirical literature is sparse on this point, sociomaterial imaginaries can become a basis for recreating temporal trajectories in the wake of tipping points. The challenge is to search the past for circumstances that connect to events in an ensuing future unlike anything yet seen. In such circumstances, actors face the challenge of *translating* between sociomaterial imaginaries, the distant past, and the emerging future. For example, climate-related disruptions are not just temporary obstacles to agricultural value chains, but also fundamentally challenge existing philosophies of industrialized agricultural production. A resilient response to such disruptions implies remaining adaptive to, for instance, an accelerating and widespread drought, but possibly reimagining what regenerative farming would look like in a world

of permanent droughts and the associated social consequences for such scenarios.

Reconfiguring temporal trajectories sometimes demands that organizations connect events from a distant past to a long-term future. Hernes, Feddersen, and Schultz (2020) discuss how Carlsberg Group Copenhagen was able to launch a new brew using 120-year-old yeast cells to enable the brewery to advance toward the future goal of achieving carbon neutrality. Workers at Carlberg's site recovered old beer bottles that were still intact and contained yeast cells from which they could reproduce beer from 120 years earlier. The process was resource-demanding and presented high uncertainty concerning its outcomes. Carlsberg scientists began testing 130-year-old barley seeds obtained from the Svalbard Global Seed Vault and experimenting with how to grow them. Notably, this process yielded outcomes beyond making beer when it was discovered that the old crops could serve as a foundation for developing more climate-resistant types of barley and paving the way for regenerative farming processes toward a sustainable future. The Carlsberg case demonstrates how an emerging socio-material imaginary may form the basis for reconfiguring a long-term trajectory spanning more than a century into the past and decades into the future. Anticipating a new future of complete sustainability, the company has embarked on a course to introduce sustainable and robust seeds for future brewing.

Critical Transitions of Temporal Trajectories

The model illustrated in Figure 1 suggests that the three phases (projecting, reconstituting, and reconfiguring) follow one another; however, this may not always be the case. If a previous phase does not lay a foundation for the succeeding phase to occur, the resilience trajectory will likely collapse, making its recreation extremely difficult. If, for example, contingencies developed in the projecting phase for stochastic events fail to enable continued operations, the organization may not have the resources to reconstitute its temporal trajectory. We next examine what may constitute critical transitions between the phases of the model for each of the three types of disruptive events. These proposed transitions are not meant to be exhaustive. Empirical research employing a trajectory perspective would enable fuller descriptions of the critical transitions to be established. Nevertheless, the transitions suggested here indicate the precarious nature of temporal trajectories in the face of disruptive events (see Table 3 for a summary).

Figure 1 illustrates how each of the three types of disruptive events implies a "pair" of complementary processes during the projecting phase. Each pair includes two types of processes. The first type involves developing concrete responses that are aimed at the occurrence of the event and its immediate consequences, whereas the second type includes preparing for the ensuing future. For stochastic events, we propose that actors engage in two types of projection processes, which we label contingencies and conjectures. We similarly contend that projecting for probabilistic transformations involves solutions and strategic narratives, and field-level innovation and socio-material imaginaries for tipping points. On closer scrutiny, a commonality among the three pairs is that the first type of projecting process (contingencies, solutions, and field-level innovation) is typically intended to address the immediate, direct consequences of the disruptive event, whereas the second type of projecting processes (conjectures, strategic narratives, and socio-material imaginaries) are aimed at the post-event future. We argue that the former type enables the transition from projecting to reconstituting trajectories, whereas the latter type enables the transition from reconstituting to reconfiguring trajectories.

TABLE 3
Critical Transitions between Phases

Phase	From Projecting to Reconstituting	From Reconstituting to Reconfiguring
Stochastic events	Contingencies ensure organizational functioning during reconstituting.	Conjectures enable actors to recognize the nature of the new situation as a basis for reconfiguring the trajectory into the ensuing future.
Probabilistic transformations	Developed solutions fit the new realities.	Strategic narratives may be used to develop a strategic direction for the ensuing future.
Tipping points	Field-level innovation fits the new reality.	Innovations can be translated into new socio-material imaginaries.

From Projecting to Reconstituting

The first critical transition that influences the recreation of a temporal trajectory occurs between the projecting and reconstituting phases. For *stochastic events*, this requires that the contingencies developed in response to the disruptive event enable continued organizational operation during the event. If contingencies do not fit the new reality, operations may collapse. Although the organization will likely experience bursts of activity (Tyre & Orlikowski, 1994), operations may not be developed in a coherent direction that provides a foundation for reconstituting operations and preparing for the ensuing future. In the case of *probabilistic transformations*, the strategic solutions must address the immediate impact of the event. Solutions developed in anticipation of environmental changes inevitably incur side effects; for example, the United Nations has criticized ethanol fuel development to reduce carbon emissions for diverting corn from the poor (Ferraro et al., 2015). For *tipping points*, the transition depends on the extent to which field-level innovation enables organizations to address the new reality.

From Reconstituting to Reconfiguring

For stochastic events, operational solutions are enacted to confront the crisis, but they may not necessarily form a sound basis for reconfiguring the trajectory toward the ensuing future. In such circumstances, a critical transition depends on whether selected solutions can be extended into the ensuing future. Such extension demands that the conjectures developed during projecting enable actors to recognize a range of ways that new operations may be designed. Probabilistic transformations confront organizations with the challenge of reconstituting the trajectory such that the solutions developed may be used in the reconfiguring phase to provide a new direction into the ensuing future (e.g., continuing to produce fossil-based vehicles while committing to a zero-carbon future). While organizations may survive the occurrence of a disruptive event, they may still fail to address the long-term impact of the event (Akrich, Callon & Latour, 2002). In the case of *tipping points*, the transition from reconstituting to reconfiguring temporal trajectories may hinge on the extent to which projecting processes have addressed broader imaginaries of the post-tipping-point circumstances. For example, if processes are based on past models or algorithms developed for a different reality, they are not likely to correspond to the new reality (Venkataraman, 2023). A criterion for transition could be that projecting phase processes provide actors with socio-material imaginaries to enable subsequent reconfiguring for the ensuing future.

DISCUSSION

The acceleration of ecological change implies that disruptive events with different combinations of probability and impact will likely become the new normal rather than exceptions. We developed a temporal trajectory model of resilience against the background of environmental change because it creates combinations of probability and impact that organizations are not designed to cope with. Our approach considers how organizations recreate their temporal trajectories by reconnecting their pasts to events in the ensuing future. Rather than assuming that actors respond to disruptive events at the time of the event as prescribed by the bouncing-back approach, our model highlights how actors consider different temporal depths of their trajectories, both backward and forward in time in a bouncing-forward movement.

While prior research on resilience has adopted a view of time as a forward succession of separate phases, taking a process lens our model assumes that actors reach back and forth across phases to recreate the direction of trajectories. According to our model, the temporal depth considered by actors depends on which phase they are in (projecting, reconstituting, or reconfiguring) and which type of disruptive event is being faced, as shown in Table 1. Considering three distinct types of disruptive events (stochastic events, probabilistic transformations, and tipping points), our model demonstrates the different processes of projecting, reconstituting, and reconfiguring temporal trajectories. By differentiating between the three events, we extend resilience research to account for different combinations of probability and the impact of disruptive events.

Implications for Studying Resilience across Organizational Levels

Previous research has typically focused on selected levels of organizational functioning. The thrust of resilience research particularly addresses the operational level (i.e., value chain operations) (Sánchez & De Batista, 2023). However, considering the ripple effects of disruptive events, it is crucial to recognize how such events can propagate across several organizational levels (Howard-Grenville & Lahneman, 2021) and how it can influence organizational

resilience. In the contemporary economy, organizations and societies are interconnected at multiple levels, which implies that a disturbance at one level will affect other levels of an organization or industry. A case in point is the COVID-19 pandemic, which demonstrated how a disruption in the healthcare system can ripple across multiple levels, including operational, strategic, and systemic (Wieland, 2021). Some events can primarily impact the level of operations, such as transitioning to another network of suppliers, whereas other events involve strategic organizational levels and require reconfiguration of strategic trajectories. Tipping points can impact entire systems of technologies, actors, and regulations at the global level, such as a radically different global healthcare ecosystem within which new strategies to address global warming and sharing of innovations between private and public actors must be developed.

Our temporal trajectory model of organizational resilience contributes to understanding how the impact of disruptive events plays out across operational, strategic, and systemic levels more comprehensively. While we have related the three types of disruptive events to different organizational levels (operational, strategic, and systemic), future research might investigate the dynamics by which disruptive events ripple across organizational levels more systematically. For example, stochastic events create immediate upheaval but can also trigger probabilistic transformations that prompt organizations to reconfigure strategic trajectories. Floods and hurricanes, which are largely considered stochastic events due to the uncertainty of the time and place of occurrence, may trigger long-term probabilistic transformations, as demonstrated by the Fukushima example above. Similarly, projecting a trajectory toward tipping points entails the development of innovative solutions that mobilize heterogeneous sets of actors to develop field-level solutions such as the possible development of new future power-to-*X* standards in the energy sector (Palys & Daoutidis, 2022). Such processes may counter the effects of accelerated systemic change that informs the reconfiguration of strategic trajectories related to energy solutions among the actors involved. This indicates that resilience to tipping points depends on interorganizational or institutional processes to create and develop solutions based on unprecedented circumstances. It also suggests that a tipping point may, in some cases, lead to a business environment in which solutions developed for probabilistic transformations may become redundant.

Implications for Studying Organizational Resilience between Disruptive Events

Previous research has primarily focused on resilience regarding singular events. However, organizations must develop resilience in response to multiple connected events of varying probability and impact. For example, Pérez-Nordtvedt, Khavul, Harrison, and McGee (2014) show how some firms were able to leverage the immediate operational consequences of relocating a football stadium to a mammoth, multi-billion-dollar entertainment complex and profit from the long-term strategic opportunities created by the move. Such research suggests how organizations may project temporal trajectories toward probabilistic transformations when they encounter stochastic events. Our model provides an understanding of the conditions under which certain disruptive events can become interconnected through time, and how organizations may build resilience between disruptive events. Our analysis reveals different temporal trajectories related to three types of disruptive events (Table 2). For example, in our model, resilience to stochastic events focuses on contingency plans to maintain operations, whereas resilience to tipping points requires consideration of greater temporal depth because the effects take longer to materialize.

In future research, scholars could extend our model by investigating the conditions under which temporal trajectories combine to build resilience between different types of disruptive events. Although it can be useful to distinguish between temporal trajectories for analyzing organizational resilience in response to different disruptive environmental events, organizations are likely to shift between different temporal trajectories or implement combinations of temporal trajectories. For example, while organizations can employ processes such as scenario thinking to prepare for stochastic events, those same processes may also inform strategic narrative thinking for probabilistic transformations. Conversely, if an organization has not directed its trajectory toward eventual stochastic events, the occurrence of such events may make it difficult to orient its trajectory toward probabilistic transformations.

Future research into the conditions for building organizational resilience between disruptive events could investigate, for example, how organizations leverage simultaneous projections of trajectories toward different disruptive events or how reconstituting trajectories for one form of event may enhance

an organization's ability to reconfigure another trajectory. Another useful research question could explore how crossing a tipping point brings new organizational or institutional environments into play as actors seek to develop solutions for probabilistic transformations in the wake of the tipping point. Scholars could also analyze how organizations engage in an accelerated process of probabilistic transformations as they move toward tipping points to seize opportunities in a new institutional environment. For example, firms develop radically new solutions as they observe the emergence of new technologies (e.g., AI) that are expected to accelerate system-wide change.

Implications for Temporal Organizational Theorizing

Finally, our model also contributes to ongoing efforts to craft a temporal process lens (Blagoev et al., 2024). The process lens builds on works in the philosophy and sociology of time to offer an alternative to the chronological and sequential view of time, instead highlighting how time is enacted through the ongoing interrelation of present–past–future events. Previous works have applied the process lens to explain how actors relate past and future events across different temporal depths to discuss outcomes for phenomena such as organizational identity (Schultz & Hernes, 2013), strategy (Kaplan & Orlikowski, 2013; Miller et al., 2019), disasters (Danner-Schröder, 2020), and organizational change (Hussenot & Missonier, 2016). This research has advanced the temporal understanding of organizations by focusing on the collective activity or temporal work (Kaplan & Orlikowski, 2013) through which actors connect past and future events in the present.

However, organizational time scholars have yet to consider the processes of connecting experiential past events with hypothetical future events. Scholars have examined how actors connect events across different temporal depths (Danner-Schröder, 2020) or how they connect events of different salience (Hernes & Schultz, 2020), but they have overlooked how the past and the future differ fundamentally in people's conception of them. For example, while the meaning or implications of past events might be contested (Hampel & Dalpiaz, 2023), their occurrence is not disputed. This means that the past trajectory of events may be established on the basis of known events among which members can establish coherence. In contrast, future events are as-if realities (Augustine et al., 2019), meaning that they could be seen to coherently connect in many different approaches and produce a plethora of scenarios.

A question that has yet to be answered in temporal organizational research is what dynamics are created at the intersection between known pasts and fictional futures. In this paper, we theorized trajectories as connecting known past events with future events of varying degrees of uncertainty. Our discussion highlights how the different organizational levels of impact of the three types of disruptive events represent differing degrees of divergence between known past and unknown future events. The model demonstrates a span between operational contingencies in the case of stochastic events and socio-material imaginaries in the case of tipping points. Future research could investigate the collaborative processes involved in creating temporal trajectories of varying divergence between known past and unknown future events. For example, we assume that increased divergence demands a greater temporal depth of consideration and a greater creative capacity for establishing coherence when past and future events are more dissimilar. Comparative research might uncover important patterns of variation to further develop the process lens and gain a more in-depth understanding of trajectory views of resilience.

CONCLUSION

Increased interdependence among organizations, combined with a growing range of disruptive change, necessitates analyses of how organizations not only respond to the immediate consequences of disruptive events but also prepare for ensuing consequences at multiple and interconnected organizational levels. We demonstrate how a trajectory perspective offers a novel way of conceiving the role of temporality in organizational resilience research. Viewed through a temporal lens, resilience is less about bouncing back to a previous state and more about enabling movement toward a new direction without losing sight of the past, which we refer to as bouncing forward. This shift in perspective is imperative, given the increasing salience of disruption as a defining and ongoing characteristic of organizational life.

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