Schumpeter School
of Business and Economics

Exploring Organizational Crises from a Legitimation Perspective –
Results from a Computer Simulation and Illustrative Cases

Heiko Breitsohl

BERGISCHE
UNIVERSITÄT
WUPPERTAL

Exploring Organizational Crises from a Legitimation Perspective – Results from a Computer Simulation and Illustrative Cases

Heiko Breitsohl

Schumpeter School of Business and Economics
University of Wuppertal
42097 Wuppertal, Germany
Phone: +49-202-439-2906
Fax: +49-202-439-3519
breitsohl@wiwi.uni-wuppertal.de

ABSTRACT

Organizational crises are rare, yet they fundamentally influence the evolution of organizations. An aspect of crises deserving more attention is the interaction of organizations and their stakeholders during a crisis from a legitimation perspective. This paper presents a simulation model mapping causal relationships behind this interaction. Results suggest that the nature and timing of organizational response to crises has considerable effect on the success and duration of attempts of regaining organizational legitimacy after a threatening event. Illustrative case studies demonstrate how several organizations have been (un-)successful in overcoming individual crises with respect to these influences.

INTRODUCTION

Organizational crises are a somewhat paradoxical phenomenon. From the perspective of the individual organization, they can bring about fundamental change, but occur relatively rarely, while the roots of those changes often remain unclear. More precisely, they are low-probability, high-impact events that threaten the organization's viability while being causally ambiguous (Hermann, 1963; Pearson and Clair, 1998). Thus, crises usually take organizations by surprise and leave a limited amount of time for the affected organization to react (Hermann, 1963; Billings, Milburn, and Schaalman, 1980; Meyer, 1982). From a societal perspective, the evolution of increasingly complex technologies (Perrow, 1984), and what has become known as high-reliability organizations (Roberts, 1990; Weick, Sutcliffe, and Obstfeld, 1999) have made organizational crises, such as accidents, scandals, or product

1

safety incidents (Marcus and Goodman, 1991) an almost daily phenomenon. Indeed, some scholars have argued that a world of discontinuities makes crises inevitable (Smart and Vertinsky, 1977). Such ubiquity, combined with the potential impact on the fate of an organization, makes organizational crises a topic not only allowing, but warranting scholarly investigation (Hermann, 1963).

Research on organizational crises has tended to focus on two questions: How do organizational crises arise, and how can they be prevented in the future? There is a rich body of literature presenting case studies of crises and analyzing with great precision the development of catastrophic events. Examples are the Tenerife air disaster (Weick, 1990), the loss of the space shuttle Challenger (Vaughan, 1990), the industrial accident at Bhopal (Shrivastava, 1992), or the Mann Gulch fire (Weick, 1993). The contributing factors to such events which are typically discussed in these studies include organizational sensemaking (Weick, 1988, 1993), intraorganizational regulatory relationships and social control (Vaughan, 1990), and information processing (Rudolph and Repenning, 2002). The causes identified in these studies have prompted other authors to provide prescriptions for organizational design in order to prevent crises or minimize their effects (e.g., Hedberg, Nystrom, and Starbuck, 1976; Turner, 1976; Smart and Vertinsky, 1977). Some scholars have focused their research on industries identified as particularly 'crisis prone' due to their use of risky technologies and tightly coupled systems (Perrow, 1984; Mitroff et al., 1989; Pauchant and Mitroff, 1988, 1992).

An aspect of organizational crises deserving more attention is the interaction between the affected organization and its stakeholders. In the wake of a threatening event, the appropriateness of the organization's attempts of coping with the crisis is determined through discourse consisting of organizational action and stakeholder feedback (Pfarrer et al., 2008). This interplay is crucial in reestablishing a sense of normalcy and moving back to a more stable mode of operation since stakeholders are part of the environment the organization relies on in order to survive (Shrivastava et al., 1988; Pearson and Clair, 1998; Yu, Sengul, and Lester, 2008).

Interestingly, research on organizational crises has produced numerous examples of how widely paths of crisis resolution between the actors involved can differ. For instance, after the Tylenol poisonings in 1982, Johnson & Johnson was able to quickly reestablish its stance as a reliable producer of pharmaceuticals, in spite of another death related to poisoned capsules a few years later (Shrivastava et al., 1988). In fact, the Tylenol case is considered exemplary in terms of how the organization reacted to a severe product safety incident (Pauchant and Mitroff, 1992). Conversely, one factor contributing to the demise of Pan American Airlines was

the inappropriate withholding of information from passengers after the loss of Flight 103 over Lockerbie, as perceived by the public (Sipika and Smith, 1993). Similarly, Bridgestone required a prolonged period of time to regain trust among American stakeholders after not disclosing the company's problems related to a large-scale recall of faulty tires (Pfarrer et al., 2008). These examples point to the importance of evaluation by stakeholders in an unfolding crisis. More specifically, it remains unclear why some organizations manage to overcome perceived inappropriateness associated with a crisis without significant difficulty, while others are unable to do so and, in some cases, exacerbate the situation and extend the crisis.

This paper aims to shed some light on this issue by exploring extant theory on organizational crises. As will be outlined in the next section, it takes a legitimation perspective by viewing an organizational crisis as subject to interactive evaluation between the organization and its stakeholders. The paper analyzes the legitimation dynamics between these actors triggered by a threatening event. This is done by building a formal model based on causal relationships identified within the literature on organizational legitimation and crises, respectively. The model is then used to simulate the interaction between the organization and its stakeholders under varying conditions. A presentation of the simulation results is followed by a discussion of their implications, illustrated by several cases drawn from the literature. A consideration of limitations and avenues for future research concludes the paper.

A LEGITIMATION PERSPECTIVE ON ORGANIZATIONAL CRISES

Organizational crises do not occur independently of the social system which the organization is part of. A vital role in the development and outcome of crises is played by organizational stakeholders (e.g., Freeman, 1984; Donaldson and Preston, 1995; Frooman, 1999), as employees, shareholders, and customers are often affected directly by a crisis. Others, especially victims of industrial accidents, may become stakeholders due to the occurrence of a crisis (Shrivastava et al., 1988; Marcus and Goodman, 1991). Moreover, in some instances, crises may be caused by stakeholders, such as dissatisfied customers, activist groups, or regulators (Meyer, 1982; Milburn, Schuler, and Watman 1983). In other cases, the perception of stakeholders may influence the spreading of crises to other organizations, changing the structure of an entire industry (Yu, Sengul, and Lester, 2008).

Stakeholders also routinely evaluate the organization and its actions and base their decisions on that evaluation: members adjust their loyalty, investors allocate financial resources, and

other constituencies decide about whether to continue transactions with the organization (Carroll and Hannan, 2000; Yu, Sengul, and Lester, 2008). Depending on their position relative to the organization, stakeholders may refer to the media for this purpose (Pollock and Rindova, 2003; Pfarrer et al., 2008). In addition to the increased general attention crises invite (James and Wooten, 2006), they threaten the positive evaluation of the affected organization by causing a loss of shared values and commonly held beliefs, putting the organization and its leadership under close scrutiny (Turner, 1976; Pearson and Clair, 1998; Ginzel, Kramer, and Sutton, 1993). In a related vein, actors in organizational fields rely on social codes to reduce uncertainty. Stakeholders may regard crises as violations of such codes, where the organization breaks the default set of rules associated with its actions (Milburn, Schuler, and Watman, 1983; Carroll and Hannan, 2000; Yu, Sengul, and Lester, 2008). Possible punitive reactions by the stakeholders include the reduction or termination of transactions, such as the purchase of products, employment relationships or financial investments (Yu, Sengul, and Lester, 2008).

A useful concept for framing these aspects of organizational crises is that of organizational legitimacy (e.g., Dowling and Pfeffer, 1975; Meyer and Scott, 1983; Ashforth and Gibbs, 1990; Suchman, 1995). An organization is deemed legitimate if its actions are "desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995: 574). This well-established definition corresponds well to the aspects of organizational crises outlined above: Crises suddenly threaten organizational legitimacy because they are perceived by stakeholders as a breach of social codes, i.e. norms, values, beliefs, and definitions. In other words, organizational crises are characterized by an unexpected loss of legitimacy. Moreover, I argue from a legitimation perspective that a negative evaluation by stakeholders lies at the core of organizational crises. Other issues, such as financial hardship, are mostly consequences of negative evaluations, not elements of crises themselves. Exceptions to this rule are loss of life or of assets occurring in events triggering organizational crises, e.g. accidents, although the assessment of such losses may differ in the perception of stakeholders (Billings, Milburn, and Schaalman, 1980).

Note that descriptions of organizational crises tend to focus on situations or events happening *to* the organization, while Suchman's (1995) definition of legitimacy comprises actions *by* the organization. This leaves two possible sources of effects on legitimacy: the environment and the organization itself. Indeed, there has been some debate over the degree of discretion an organization has when trying to manage its legitimacy (Suchman, 1995). Some scholars tend

to view the single organization as relatively weak and passive compared to the dynamics shaping its industry or economic sector (e.g., Meyer and Rowan, 1977; DiMaggio and Powell, 1983; Zucker, 1987; Oliver, 1991; Dacin, 1997). Others emphasize a wide variety of activities an organization can employ to actively influence its environment and, consequently, the way it is perceived and attributed legitimacy (e.g., Dowling and Pfeffer, 1975; Ashforth and Gibbs, 1990; Aldrich and Fiol, 1994; Suchman, 1995). Like Suchman (1995), I take a middle road between those two approaches, conceptualizing the organization as faced with external pressures *and* equipped with a repertoire of strategies for influencing its stakeholders. Institutional environments do shape the course of an organization's evolution and create boundaries of action for the organization, but not independently of it. Conversely, stakeholders are susceptible to organizational legitimation activities to some extent, albeit a limited one.

The literature on organizational legitimation offers several typologies of legitimation strategies. For instance, Suchman (1995) differentiated between strategies aimed at pragmatic, moral, or cognitive legitimacy. Zimmerman and Zeitz (2002) provided a typology of how organizations may affect change in their environment to varying degrees by conformance, selection, manipulation, or creation. A third variant focuses on the purpose of legitimation pursued by the organization (Ashforth and Gibbs, 1990; Suchman, 1995). If the organization is attempting to become established, possibly in a newly emerging industry, its goal is to *extend* or *gain* legitimacy by building knowledge and setting precedents in the social order (see also Aldrich and Fiol, 1994). Once it has overcome the "liability of newness" (Stinchcombe, 1965; Freeman, Carroll, and Hannan, 1983), the organization directs its efforts at *maintaining* legitimacy through role performance and monitoring. In the case of organizational legitimacy being threatened, *repairing* or *defending* it and re-establishing credibility and stakeholder relations become the purpose of legitimation activities. Reviewing the literature on legitimation strategies, Suchman (1995) pointed out that "legitimacy acquisition strategies outnumber legitimacy maintenance and legitimacy repair strategies, combined. This pattern both reflects the biases of the existing legitimacy literature and indicates the need for future research" (p. 599). However, very few studies have provided additional insight into how organizations react to problematic stakeholder evaluation. Exceptions include the works of Sutton and Callahan (1987), Dutton and Dukerich (1991), Elsbach (1994) as well as Hoffman and Ocasio (2001).

Addressing both this shortage and the explanation of organizational crises outlined above, the focus of this paper, concerning legitimation strategies, is put on the latter category of regain-

ing legitimacy. Such strategies are generally reactive, since the circumstances causing the necessity to repair legitimacy are unforeseen by the organization. Responses triggered by legitimacy-threatening events tend to be intense, reflexive, and often rigid (Staw, Sandelands, and Dutton, 1981; Ashforth and Gibbs, 1990). They may take a variety of forms in terms of accommodating the expectations and demands uttered by stakeholders. At the defensive end of the spectrum, management may choose to deny or conceal any connection to an event, or attempt to withdraw from the scene. At the accommodative end, it may offer apologies and restitution to those negatively affected, or restructure in order to avoid future crises (e.g., Schlenker, 1980; Tedeschi and Melburg, 1984; Sutton and Callahan, 1987; Elsbach, 1994; Arndt and Bigelow, 2000; Elsbach, 2003). Moreover, responses to losses in legitimacy differ in their degree of symbolism vs. substance. Some organizations may react by substantively changing their structure or processes, e.g. by replacing management, creating monitors or watchdogs, or by disassociating themselves from problematic entities. Others may symbolically offer the appearance of conformity through ceremonial action, such as certification or bureaucratization, or by giving verbal accounts, like explanations and justifications (Meyer and Rowan, 1977; Pfeffer, 1981; Ashforth and Gibbs, 1990; Suchman, 1995; Elsbach, 2001; see Westphal and Zajac, 1998, for a related example).

However, reactive legitimation activities may not always lead to the intended outcomes. Ashforth and Gibbs (1990) suggested that stakeholders discount legitimation practices depending on the organization's current legitimacy, resulting in what they refer to as the 'self-promoter's paradox': the more problematic the organization's legitimacy, the more difficult the acquisition of additional legitimacy. This principle creates boundaries on the organization's discretion in legitimation activities, since it limits the acceptable deviation from stakeholder expectations. Intense and rigid reactions to a surprising event may therefore be perceived as inappropriate, validating stakeholder skepticism and further decreasing perceived legitimacy. Suchman (1995) elaborated that such 'legitimacy crises' may escalate through self-reinforcing feedback loops, driving down organizational legitimacy. To the extent that stakeholders provide resources to the organization (Frooman, 1999), a reduction of support may disrupt critical resource flows. In extreme cases, former allies may even engage in active sniping and ostracism. The concepts of feedback processes and malign dynamics in organizational legitimation are intriguing, yet have not received significant attention thus far. They therefore lend themselves to further investigation.

A MODEL OF ORGANIZATIONAL LEGITIMACY CRISES

Research Approach

In order to explore and extend theory on organizational crises from a legitimation perspective, I developed a computer simulation model (Davis, Eisenhardt, and Bingham, 2007; Harrison et al., 2007). Choosing simulation as a research approach was based on the possibilities it offers for theory development. Since simulation results may be analyzed like longitudinal empirical data, but follow inevitably from a set of assumptions, it combines the strengths of the classical methods of induction and deduction and has been recognized as a 'third way of doing science' (Pool, 1992; Axelrod, 1997; Hulin and Ilgen, 2000; Harrison et al., 2007). Simulation can also offset some of the shortcomings associated with theory building and testing, such as data availability, mathematical tractability, and logical rigor. Furthermore, transforming an apparently well-understood theory into a formalized simulation model requires discipline and great precision in the specification of constructs and assumptions, increasing internal validity (Sutton and Staw, 1995; Davis, Eisenhardt, and Bingham, 2007). The transformation process may also reveal gaps in the understanding of the theory and permit a more thorough or parsimonious explanation of the focal phenomenon (Hanneman, Collins, and Mordt, 1995; Harrison et al., 2007). Analyzing the data generated by the model may provide additional insights into "implied dynamics" (Hanneman, Collins, and Mordt, 1995: 7) undetectable without the use of simulation. The latter benefit is further enhanced since simulation provides a virtual laboratory for conducting experiments in order to answer questions as to "what is, what might be, and what should be" (Burton, 2003: 93) as well as for testing alternate hypotheses when empirical data are available (Bronson and Jacobsen, 1986).

Following the roadmap for simulation-based research developed by Davis, Eisenhardt, and Bingham (2007), my goal was to hit the 'sweet spot' between inductive or formal theory building, and statistical theory testing, where simulation can contribute most effectively to theory. Starting with the research problem, i.e. how organization-stakeholder interaction influences crisis development, I identified and selected extant theory addressing aspects of the problem, which will be discussed in detail in conjunction with the simulation model. As simulation approach, I chose to employ system dynamics (Forrester, 1961; Sterman, 2000). System dynamics is essentially "a method to enhance learning in complex systems" (Sterman, 2000: 4). It is a suitable tool for exploring theory and its implications due to several of its characteristics. First, system dynamics takes a feedback perspective, viewing systems as an intricate network of cause and effect. Thus, it explicitly accounts for the complexity of social systems,

constituted by circular causal relationships. These relationships feed back through the system, forming causal loops (Richardson, 1991). This approach has advanced our understanding of a variety of phenomena, such as organizational failure (Hall, 1976), vicious circles (Masuch, 1985), adaptive learning (Lomi, Larsen, and Ginsberg, 1997), punctuated organizational change (Sastry, 1997), quality management (Sterman, Repenning, and Kofman, 1997), decision making (Perlow, Okhuysen, and Repenning, 2002), process improvement (Repenning, 2002), disasters (Rudolph and Repenning, 2002), and new technology implementation (Black, Carlile, and Repenning, 2004).

Second, system dynamics offers both a qualitative and quantitative method of analyzing causal relationships. The phenomenon at hand may be studied qualitatively by creating a 'causal loop diagram' consisting of variables as well as the causal links between them, which may have a positive or negative polarity. Based on a qualitative causal loop diagram, a quantitative simulation model may be built. This enables the researcher to observe the system's behavior over time and in much greater detail by subjecting the model to a variety of tests, and, if available, by integrating empirical data into the analysis (Sterman, 2000). Third, system dynamics simulation models include different types of variables, representing states ('levels' or 'stocks') as well as rates ('flows'), making them "particularly useful for looking at strategic issues within organizations" (Robinson, 2004: 25). Thus, a model not only captures the state of a system at any point in time. It also mirrors the rates changing the state, for instance, the occurrence and resolution of interruptions in an organization (Rudolph and Repenning, 2002). This is in consonance with McKelvey's (1997) suggestion of modeling rates rather than states. In fact, system dynamics appears to be the only simulation approach offering this ability (Dooley, 2002).

The process of developing a system dynamics model consists of several steps, most of which are congruent to those generally followed in simulation modeling (e.g., Banks, 1998; Musselman, 1998; Robinson, 2004; Gilbert and Troitzsch, 2005). Typically, the initial task is to select the boundaries of the model, i.e., articulate clearly the research problem and the key concepts to be included and excluded. At this stage, it is crucial not to attempt modeling the entire 'system', e.g. an organization in all its details, but to focus on a specific problem. Otherwise, the model may become too broad to handle in terms of model construction, data gathering, and model testing (Sterman, 2000). Once the scope of the model as well as the underlying concepts have been established, they are mapped in the form of a causal diagram. Modeling theoretical constructs – as opposed to a simply observable real system like, say, an oil

refinery – is accomplished by combining the causal relationships extracted from the relevant literature. As explained above, the result is a visual representation of the feedback loops hypothesized to cause the focal phenomenon. Note that a causal diagram describes a structure, not a pattern of behavior (Randers, 1980). The behavior of the system becomes visible once the simulation model is run.

Causal Model

Drawing mainly on literature focusing on legitimacy as well as organizational crises, I developed a system dynamics model, the causal diagram of which is shown in Figure 1. In determining the scope of the model, I chose to keep it as simple as possible. Not only are large models difficult to construct, their comprehensibility also rapidly decreases with growing size, making them difficult to test and evaluate (Barlas, 2007). My goal was to capture "the central logic while stripping away the nonessential" (Davis, Eisenhardt, and Bingham, 2007: 491), which is why I concentrated on building a model that is parsimonious and enhances readers' intuition and confidence in the simulation results.

One critical step in developing a simulation model is the determination of the model boundaries, i.e. what to build into the model and what to leave out. Consistent with keeping the model simple, I included only concepts related to the interactive legitimation between an organization and its stakeholders following a crisis. More specifically, since legitimacy is a perception based on individual evaluation and social construction (Suchman, 1995), its formation takes place largely in the minds of stakeholders. Therefore, most of the concepts comprised by the model are a representation of this 'internal' evaluation process. Only the upper part of the model depiction in Figure 1, namely the variable *organizational reaction strength* corresponds to the actions of the organization. Significantly, there is no variable in the model directly representing the crises itself. The crisis is a process triggered by an event which originates beyond the boundaries of the model. The model excludes factors contributing to the formation of a crisis (e.g., Turner, 1976; Vaughan, 1990, 1999; Pauchant and Mitroff, 1992). Its boundaries delineate the line of visibility for the organization's stakeholders. Hence, the crisis becomes visible only due to the triggering event (Shrivastava et al., 1988; Roux-Dufort, 2007a).

The central concept – and thus, variable – of the model is the organization's *level of legitimacy*. If there is a decline in legitimacy, the organization reacts by engaging in activities to regain legitimacy. Reactions, however, occur with a certain *delay* due to information

Figure 1. Causal model.
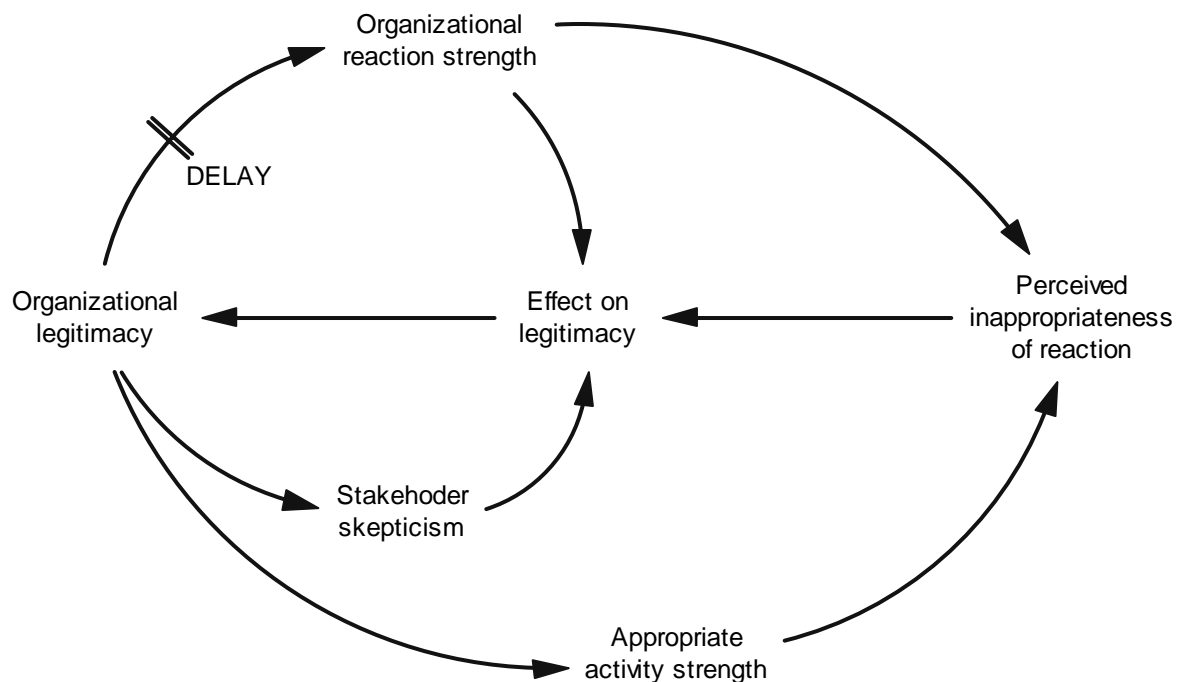
processing restrictions associated with the inherently surprising character of crises. Generally, organizations require some time for information gathering and processing as well as planning a reaction (Smart and Vertinsky, 1984; Sastry, 2001). Moreover, crises are unanticipated by organizational actors because there is no routine or "program" for dealing with crisis readily available. The mere possibility of such an event is seldom recognized. When a crisis does happen, communication channels used to process information are reduced (Hermann, 1963; Ginzel, Kramer, and Sutton, 1993). In terms of the content of communication, the increased likelihood of misunderstanding and failures may contribute to the problems in handling information about the incident (Turner, 1976). Although other pathologies underlying flawed decision making in the wake of a crisis have been identified (e.g., Smart and Vertinsky, 1977; Billings, Milburn, and Schaalman, 1980; Staw, Sandelands, and Dutton, 1981; Pearson and Clair, 1988), these issues are condensed to a delay in reaction within my model for the sake of simplicity.

Organizational reactions to a threatening event may take a variety of forms, differing in their extent of accommodation of stakeholder demands as well as their degree of symbolism. My model reduces these attributes to a single dimension, representing the *intensity of legitimation efforts*, which can be regarded as reflecting both accommodativeness and symbolism. Ac-

commodative behavior not only entails psychological 'costs' such as admitting guilt, taking blame and offering apologies. It is also typically associated with higher financial strains for the organization, especially when involving restitution or monetary fines. Similarly, almost by definition, substantive reactions require greater efforts than purely symbolic ones. For instance, concealment or simply refraining from any action bears very little direct costs, while replacing personnel or restructuring the organization may create significant expenditures.

Current legitimacy also has an effect on stakeholders' perception of the organization's attempts at regaining legitimacy. The perceived violation of social code renders stakeholders uncertain towards organizational actions (Yu, Sengul, and Lester, 2008). More specifically, a loss in legitimacy reduces the organization's credibility among stakeholders. They skeptically discount legitimation efforts as potentially self-serving or even manipulative. As Ashforth and Gibbs pointed out: "the lower the perceived legitimacy, the more skeptical will constituents be of legitimation attempts" (1990: 186). The degree of skepticism exhibited by stakeholders has an adverse impact on the effectiveness of legitimation attempts.

Beyond discounting legitimation efforts, stakeholders assess the *appropriateness* of the organization's response in terms of their expectations, norms and values. An otherwise legitimate organization is granted a certain leeway in its reaction to threatening event. Conversely, the more problematic the organization's legitimacy, the narrower the spectrum of activities accepted by stakeholders. With respect to the intensity of legitimation efforts, extremely weak activities, such as concealment or remaining silent, are judged inappropriate because they suggest that the organization places little value on the severity of the situation. Weak reactions may also create the impression of lack of control, which runs contrary to stakeholder expectations. Moreover, since organizations are subject to norms of rationality and professionalism, purely symbolic activities may also be frowned upon (Salancik and Meindl, 1984; Ashforth and Gibbs, 1990). Very strong reactions to crises, on the other hand, may be perceived as indications that something is amiss. They may appear to stakeholders as clumsiness, nervousness, overacting, or even panic, and may thus be destructive to the remaining level of organizational legitimacy (Hermann, 1963; Ashforth and Gibbs, 1990; Suchman, 1995). Attempts which fall outside the interval deemed appropriate inadvertently undermine legitimacy instead of repairing it. The concept of inappropriate reactions differs from that of stakeholders discounting organizational actions, as outlined above, in that the latter moderates the effects of legitimation activities whereas the former directly reduces legitimacy.

From causal model to simulation model

With the theoretical basis and the adequate simulation approach in place, the next steps in simulation research are to create the computational representation of the causal model, including operationalization of theoretical constructs and specification of assumptions, and to verify it in light of the underlying theory (Davis, Eisenhardt, and Bingham, 2007). The computational model was built and analyzed using the VenSim software. With regard to operationalization and specification, I defined all variables as single-dimensional measures, with values ranging from 0 (e.g., no legitimacy) to 1 (e.g., full legitimacy). For the duration over which to run the simulation model, I chose 100 time periods, since this provides a sufficient, yet manageable time span for observing and analyzing model behavior.

Verification, which partly coincided with experimentation, revealed a shortcoming in terms of the representation of the theoretical basis of the model. More specifically, it required me to make one significant change to the model, concerning the effect of legitimacy on the organization's reaction. The model is designed to represent crises in terms of organizational legitimation, i.e. losses in the level of current legitimacy. Hence, the greater the *acute decline* in legitimacy due to a threatening event, the stronger the reaction aimed at regaining legitimacy. However, the extent to which organizational actors perceive crises also depends on the value of *possible* loss associated with the threatening event (Billings, Milburn, and Schaalman, 1980). Therefore, organizations with a low *level* of legitimacy, which are already facing their possible demise, exhibit stronger reactions than otherwise legitimate organizations (Ashforth and Gibbs, 1990). Consequently, I divided the effect of legitimacy on organizational reaction into two distinct effects for the level of legitimacy, and changes in the level, respectively. The level effect determines legitimation activity based on the current legitimacy level. The loss effect causes an additional reaction by the organization whenever the level of legitimacy declines compared to the previous time period.

DYNAMICS OF LEGITIMATION FOLLOWING ORGANIZATIONAL CRISES

The essence of using simulation techniques for building theory lies in experimentation (Davis, Eisenhardt, and Bingham, 2007). I therefore employed the 'what-if'-capabilities of computer simulation by running the model through a series of experiments. The model is a representation of causal relationships between an organization and its stakeholders – a *system*, from a system dynamics perspective. The experiments were designed to expose the system to organizational crises under a range of different conditions. In order to gain a comprehensive under-

standing of the system's behavior, I varied characteristics of both the crises (severity) and the organization (reaction delay). As is typical when employing simulation methods, experimentation consisted of many runs, and only those highly relevant for the research problem are presented here.

As explained in the model description, within this paper, crises are treated as exogenous events. The system consists of the organization and its stakeholders, and only as far as legitimation is concerned. Although crises may have causes internal to the organization, they are external to the mechanism by which organizational legitimacy is interactively determined. Thus, a crisis is represented by a sudden decline in legitimacy. Since organizational legitimacy is not problematic prior to the event, i.e. legitimation interaction between organization and stakeholders is weak, the crisis may be considered a jolt away from equilibrium (Meyer, 1982; Milburn, Schuler, and Watman, 1983). Such jolts may be associated with anomalous events like accidents, scandals, products safety incidents, or bankruptcy (Marcus and Goodman, 1991; Hudson, 2008). With regard to conditions at the start of the simulation runs, the organization was assumed to be very well established, with full legitimacy. Ancillary tests generally confirmed that relaxing this assumption does not significantly affect results.

Exposing the organization to crises of increasing severity

For the first experiment, I introduced threatening events of varying strength by conducting pulse tests, the results of which are shown in Figure 2. Since the organization is assumed to have an initial legitimacy level of 1, neither its stakeholders nor itself are induced to take any action. The system is in equilibrium. It is then exposed to a 'pulse' of decreasing legitimacy, i.e. of a sudden decline in the legitimacy level, lasting for one time period. Although this kind of test may be limited in its realism, it is very useful for analyzing how systems behave in disequilibrium situations (Sterman, 2000; Rudolph and Repenning, 2002). For this model, the pulses may represent the disclosure of an accident, scandal, or product safety incident, or simply unexpected negative media coverage. The experiment consisted of four scenarios, differing only in the severity of the threatening event. Figure 2a displays the simulation output for the first scenario.

Initially, the system is in equilibrium, with organizational legitimacy remaining at a constant value of 1. In time period 10, a threatening event of mild strength occurs, diminishing legitimacy. This triggers the organization to react by engaging in some effort to regain full

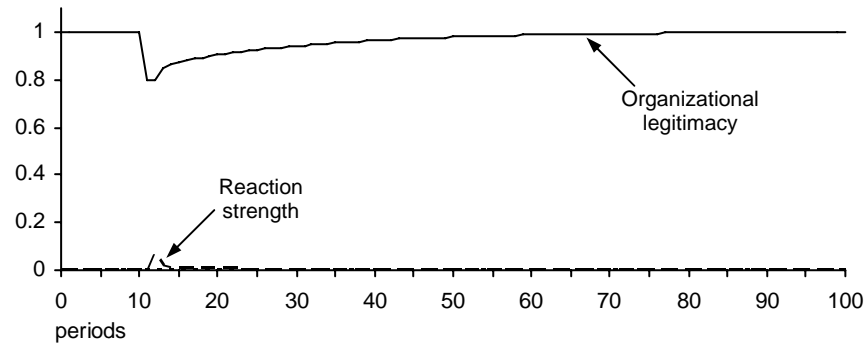**Figure 2. Organizational legitimacy, reaction strength, and perceived inappropriateness with crises of increasing severity.**
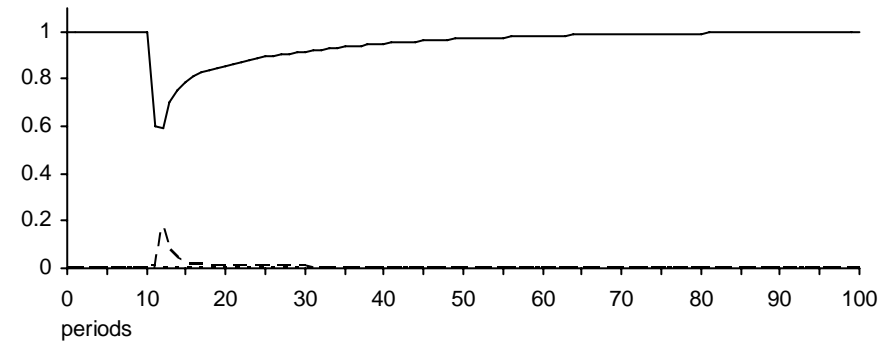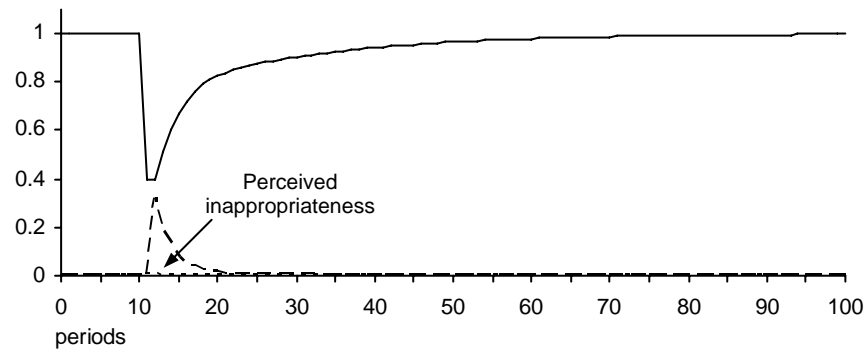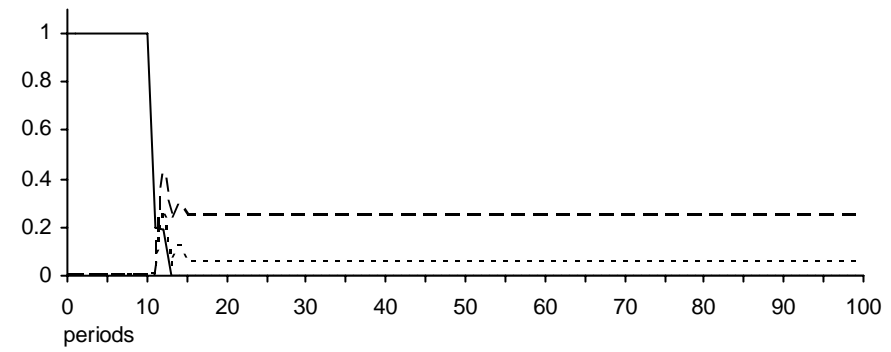
Figure 2a.

Figure 2b.

Figure 2c.

Figure 2d.

legitimacy. Since the event only slightly reduces stakeholder perception of the organization's credibility, its legitimation activities are successful and, after a few 'weeks', legitimacy is almost back at its original value. For the second scenario (Figure 2b), I doubled crisis severity. All other conditions remained unchanged; therefore the results for the first nine periods are exactly the same for all scenarios. Again, after a sharp decline in legitimacy, the organization takes measures to repair its evaluation by stakeholders, and successfully so, albeit after a longer time interval. The same pattern holds true for a crisis three times the strength of the first run (Figure 2c). While the stronger reaction by the organization causes some perception of inappropriateness with stakeholders in periods 11 and 12, it is too faint to have any significant effect on organizational legitimation activities. The time span required to regain legitimacy is further prolonged. The situation changes considerably in the face of an even more severe threat. In the fourth run for this experiment (Figure 2d), I increased the scale of the legitimacy crisis to fourfold the original strength. This leads to strikingly different results. Again, the first nine periods of the simulation run are identical to the scenarios described above, and the threatening event sharply reduces legitimacy. Yet, in contrast to the previous scenarios, the reaction induced by the incident is stronger and is considered inappropriate by stakeholders. Organizational legitimacy declines further until it reaches a value of zero. Attempts at defending legitimacy are maintained but have no effect other than evoking perceptions of overacting.

The most striking result of this first experiment was the disproportionate effect of crisis severity on legitimacy, organizational reaction, and perceptions of inappropriateness. While doubling and tripling crisis severity produced increasing amplitudes in all variables, the pattern of behavior remained the same. An additional rise in event strength, however, led to a very different outcome. Within two time periods, the organization loses all of its legitimacy, despite great efforts to recover, which are met only by disapproval. This pattern, known in system dynamics methodology as a *tipping point*, warranted further investigation. I therefore conducted further tests in order to find the tipping point and analyze the system's behavior in its vicinity. Specifically, I identified a crisis severity value of 0.77, i.e. a sudden 77 percent loss of legitimacy, as the tipping point. I then ran pulse tests close to the tipping point as well as farer away to clarify the nonlinear effects just described. The results are shown in Figure 3.

Congruent with the first part of the experiment, legitimacy losses of 40 percent and 70 percent, as mapped by the upper two lines, follow the same pattern. The threat is countered by actions to regain legitimacy, which lead to recovery after a number of periods; the more

Figure 3. Organizational legitimacy around the tipping point.
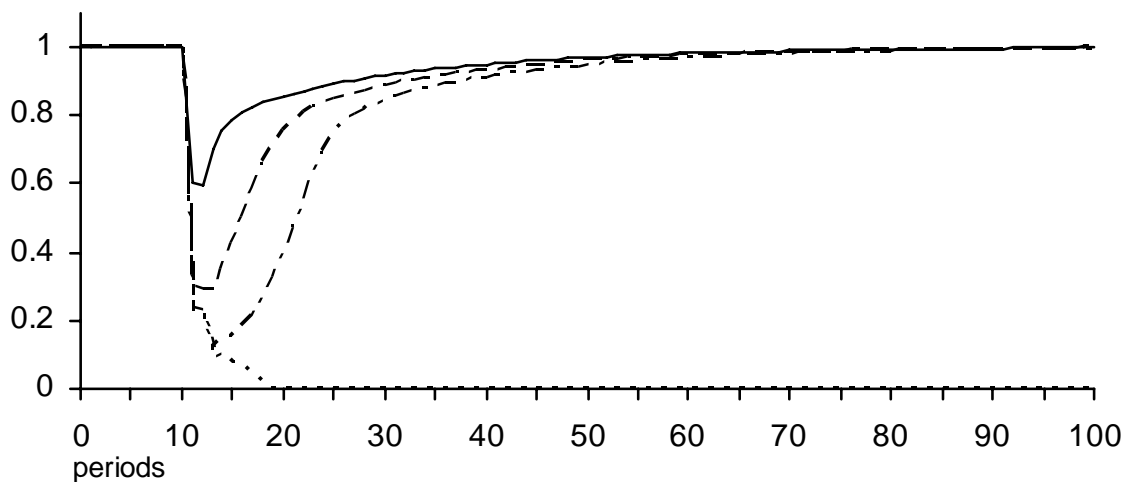
severe the threat, the longer the repair phase. When approaching the tipping point, however, two aspects of the system's behavior change considerably: the result of the interaction immediately after the event, and the relative time required to reestablish full legitimacy. First, the time span passing before full recovery increases disproportionately the closer threat severity gets to the tipping point. Raising threat severity from 70 percent to 76 percent produces approximately the same increase in required recovery time as the raise from 40 percent to 70 percent. This is due to the double effect of reduced legitimacy on stakeholder perception. At a 70 percent loss, compared to 40 percent, stakeholder skepticism climbs to a higher level, making organizational legitimation activities less effective. Legitimation requires a longer time span since skepticism has to be gradually reduced. The relatively slight increase in threat severity from 70 to 76 percent, though, introduces perceptions of inappropriateness as to the organization's reaction. This effect, again, is twofold. As a direct result, an extra loss of legitimacy adds to the ground the organization has to regain, prolonging recovery in addition to general skepticism. Indirectly, a further extension of repair time results from the fact that resistance posed by stakeholder skepticism has now reached a new high due to the extra loss in legitimacy.

Second, and more critically, when confronted with a threat just below the tipping point (76 percent), the organization does not go into recovery right away. Although the legitimacy crisis only occurs for a single time period, legitimacy continues to decline through period 13 of the simulation run. The initial reaction on the part of the organization not only fails to stop legiti-

macy from falling, it exacerbates the situation. The organization's already damaged legitimacy is further undermined by the strong response to the threatening event. In addition to rendering stakeholders very skeptical of legitimation attempts, the perceived inappropriate reaction causes them to lower their evaluation of the organization. Yet, in this scenario, management can sustain a basic level of support among stakeholders and rebuild full legitimacy. When crossing the tipping point, these two responses by stakeholders become dominant and determine the ensuing complete loss of legitimacy. Due to the initial event, increased stakeholder skepticism already restricts the organization's efficacy in defending itself. Then, stakeholders 'punish' the organization by reducing their perception of legitimacy. This additional loss triggers management into an even stronger reaction to save the remaining level of support, leading to a further increase in stakeholder skepticism and an even lower evaluation. A vicious circle sets in, driving down legitimacy as members of the organization frantically try to rebuild it over the course of seven time periods. The end result is a complete loss of legitimacy in period 19 of the simulation run.

Effects of varying reaction time to the crisis

Organizations are generally incapable of reacting immediately after a threatening event because they need time to collect and process information. This ability may further deteriorate when communication channels are reduced due to the stress associated with crises. Organizations also often lack routines for coping with crises. Aside from this involuntary, 'built-in' feature, organizations may also *actively choose* not to react immediately when a crisis occurs. As part of the broad spectrum of available responses, they may opt to withdraw from public discussion of the incident or conceal their involvement in order to minimize the impending negative evaluation by stakeholders. Thus, there are two sources of reaction delay after a threatening event. Since, from the stakeholders' perspective, these are indistinguishable, this opens another avenue for experimentation.

For my second experiment, I investigated the effect of varying organizational reaction times after the crisis on legitimacy. More specifically, I focused on the loss effect incorporated in the model, representing the influence of changes in legitimacy on the intensity of the organization's reaction. Varying the delay that is part of the loss effect allows analyzing how stakeholders perceive the timing of organizational reaction, be it involuntary or purposeful. The results of the experiment are displayed in Figure 4.

Figure 4. Organizational legitimacy with increasing delay of reaction.
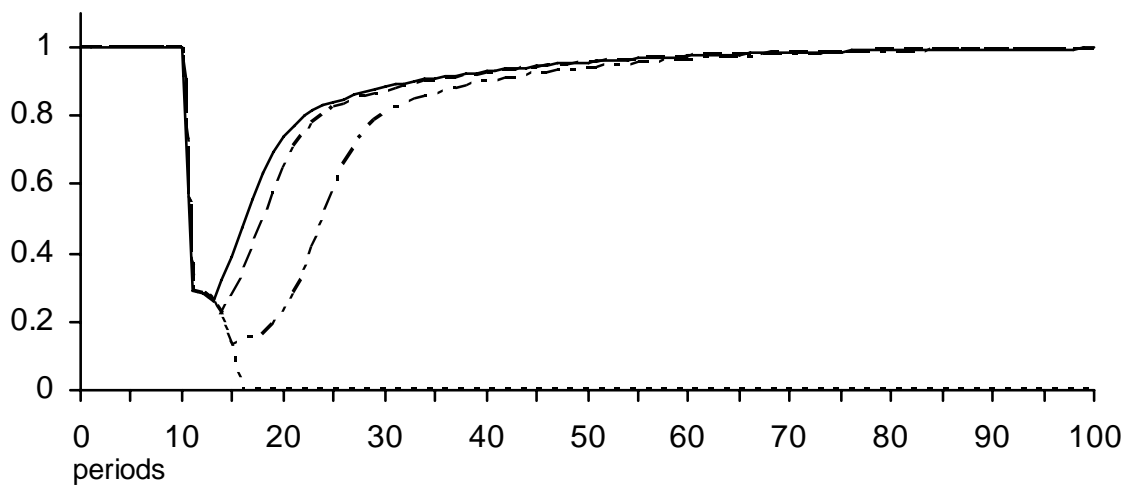
As in the experiment reported above, I ran four scenarios, differing only in the reaction delay. Crisis severity was 71 percent for all runs, reflecting a severe yet manageable threat to the organization. The first run, containing no additional delay, is therefore congruent with the now familiar pattern. After a short episode of overacting and the consequent punishment by stakeholders, the organization regains control of the situation and recovers from the crisis. Increasing the reaction delay by one, two, and three time periods, respectively, reveals system behavior noteworthy in several aspects. First, similar to increasing crisis severity, raising reaction delay has a disproportionate effect on organizational legitimacy. While adding one time period only slightly prolongs the time span needed to recover, two extra periods produce a much more significant lag. For instance, in period 21, the one-extra-period organization has regained 71 percent of legitimacy, while its two-extra-period counterpart is still at a much lower 28 percent. Increasing reaction delay to three additional periods results in the organization reacting too late to achieve successful repair, and a complete loss of legitimacy. Second, the deterioration of organizational legitimacy is also disproportionate to reaction delay. Within the three time periods constituting the increasing delay, the additional legitimacy losses are four, nine, and thirteen percent, respectively. During the time stakeholders wait for the organization to react, the situation becomes increasingly worse. In more mathematical terms: the level of legitimacy accelerates towards zero.

These two phenomena have their causes in the same mechanisms. Stakeholders expect organizations to keep their reaction within a certain interval of intensity. Reacting extremely

strong is perceived as overzealous, while too faint a reaction raises suspicions as to whether something is amiss. A greater delay in the organization's reaction is perceived by stakeholders as inappropriate. Stakeholders therefore reduce their perception of legitimacy. If the organization now chooses to react, regaining support has become more difficult and requires more time, but only slightly more than before. If a reaction fails to appear, stakeholders lower their evaluation by an even larger portion. The already problematic level of legitimacy has rendered them more critical of the intensity of legitimation attempts, making them open only to very moderate reactions. By the end of the third period of waiting, organizational legitimacy has deteriorated to the point where activities aimed at repairing it fall on deaf ears. This last aspect, as well as the disproportionate positive relation between reaction delay and recovery time is also due to stakeholder skepticism. As lower legitimacy contributes to skepticism, attempts at regaining legitimacy are discounted more and more, making them less effective. Thus, during a waiting period, legitimacy is not only reduced on grounds of inappropriateness, but the organization is also less capable of stopping the downward trend because stakeholders are more skeptical towards its actions. In the case of the three-extra-period organization in Figure 4, by the time the organization reacts to the threatening event, legitimacy has eroded and skepticism has risen to a degree where legitimation activities are futile.

DISCUSSION

The results of the experiments reported above contain several potential additions to theory on organizational crises which are discussed in this section. According to Davis, Eisenhardt, and Bingham (2007), the final step of simulation modeling lies in validating results with empirical data in order to strengthen external validity of the underlying concepts. They describe two possible approaches to validation, depending on data availability: employing the simulation model to predict the results of existing large-scale statistical data, or comparing simulation output to case studies for "granular validation" (p. 494). I chose to follow the latter approach. Crises, by their very definition, are rare events, making it difficult to collect large-scale statistical data. Therefore, most empirical research on organizational crises is qualitative in nature and focuses on case studies. Although there have been efforts to analyze large numbers of cases (e.g., Lin et al., 2006), the vast majority of studies report on one or a few cases (e.g., Vaughan, 1990; Weick, 1990, 1993; Shivastava, 1992). Moreover, my simulation model operates at a relatively high level of abstraction. As Siggelkow (2007) proposed, case studies can illustrate conceptual arguments by clarifying how they relate to real-world phenomena. I selected several cases of crises from the extant literature and extracted the details relevant to

organizational legitimacy. They are interwoven with the general discussion of simulation results.

The purpose of this paper was to explore theory on organization legitimation and crises in order to gain insights into why some organizations successfully regain trust among stakeholders while others are unable to do so. To this end, I constructed a system dynamics model mapping the causal relationships behind the interaction between an organization and its stakeholders in the context of a crisis. For the sake of parsimony and comprehensibility, I kept the model as simple as possible and as complex as necessary. The model was then run through two series of experiments. The first involved exposing the system to crises of increasing severity. It revealed a disproportionate effect of crisis severity on legitimacy, organizational reaction, and perceptions of inappropriateness, resulting in a tipping point in the system's behavior. Just below this point recovery time rises considerably. Above, a vicious circle of reaction, skepticism and perceived inappropriateness sets in, driving legitimacy down to zero. The second experiment focused on the delay in organizational reaction to crises. Similar to the first, it showed that recovery time increases disproportionately high with reaction delay. Moreover, the longer the organization fails to react, the more problematic its legitimacy, at a growing rate.

The idea of vicious circles in social systems has been discussed for many years now (e.g., Forrester, 1971; Masuch, 1985). With regards to organizational legitimation, it has been suggested that overacting on the part of the organization may trigger such circles (Ashforth and Gibbs, 1990; Suchman, 1995). However, there have been little efforts directed towards validation. The results generated by my model support the notion of vicious circles of delegitimation in the wake of organizational crises. More specifically, results indicate that there is a tipping point in the evaluation of organizational actions by stakeholders beyond which feedback loops of increasing skepticism, inappropriate response, and deteriorating legitimacy dominate to completely destroy stakeholder trust in the affected organization (Roux-Dufort 2007b; see also Hambrick and D'Aveni, 1988). As described in the introduction of this paper, the withholding of information about its flight lost over Lockerbie has been found to have further damaged the already problematic image of PanAm, which ultimately diappeared from the market (Sipika and Smith, 1993).

Even if the system does not cross the tipping point, intense skepticism and strong perceptions of inappropriateness may still have negative effects on the organization in that they may significantly prolong the time span required to regain full acceptance. For instance, in the wake

of the Valdez oil spill in 1989, Exxon reacted by attempting to shift the blame not only to the ship's captain, but also to the State of Alaska. In addition, Exxon tried to minimize the effects of the catastrophe by understating estimates of measurements of the damage, such as the number of animals killed or miles of beaches affected. The public, already suspicious due to the extensive media coverage of the incident, perceived these reactions as highly incompetent and insufficient in terms of compensating for the corporation's guilt. The company fell from sixth place to number 110 in Fortune magazine's admiration ranking, and became a favorite object of ridicule on entertainment television. Other stakeholders responding negatively to Exxon's activities included customers, several thousand of which returned their credit cards in protest, and stockholders, who subjected its chairman to intense questioning on the company's handling of the situation (Benoit, 1995; Pearson and Clair, 1998; McLane, Bratic, and Bersin, 1999; Pfarrer et al., 2008). Similarly, Firestone, when confronted with serious product safety issues associated with 271 deaths in 2000, attempted to shift the blame to Ford, despite an over 100-year-old business relationship. This, alongside the ineffective denials that a problem existed in the first place, resulted in unfavorable public opinion about the company well after its initial reactions (Blaney, Benoit, and Brazeal, 2002). Sears Roebuck also suffered from a tarnished reputation after mishandling the controversy surrounding accusations of fraudulently charging customers for unnecessary repairs on their cars. Criticism was directed particularly at Sears' claims that the state's accusations were politically motivated, which were viewed as an inability or unwillingness to take full responsibility for its actions (McLane, Bratic, and Bersin, 1999; Elsbach, 2001).

Other organizations have proven more able to recognize the effects of initially inappropriate reactions and change their strategies, gradually moving back towards full legitimacy. For instance, Dow Corning suffered considerably regarding its public image during the breast implant crisis after attacking the FDA and incurring punitive damages from a lost lawsuit over defective implants. In addition, there were allegations about internal documents suggesting that Corning knew about the potential hazardousness of its products. These actions and their perception by stakeholders illustrate the escalating nature of legitimacy crisis proposed by the results of my model. Interestingly, Dow Corning was able to turn the controversy around by releasing the internal documents, replacing the two most senior executives as well as communicating that it would help implant recipients (Brinson and Benoit, 1996; see also Ginzel, Kramer, and Sutton, 1993). In a similar fashion, Toshiba redeemed itself in the eyes of US consumers after dramatic losses in legitimacy, following the illegal sale of submarine propeller technology to the Soviet Union. Struggling to fend off an impending import ban on To-

shiba products, the company switched from symbolic acts, including the resignation of its chairman and president, to explaining to the American public the ultimate substantive consequences of the planned parliamentary action, i.e. the loss of many jobs in Toshiba's US factories (Hobbs, 1995). Drastically changing the nature of its reactions also helped AT&T overcome the crisis triggered by an interruption of its long distance service in the New York area in 1991. After trying to place the blame on its workers, AT&T dealt with the threat successfully by engaging in mortification and corrective action, thereby bolstering its image (Benoit and Brinson, 1994).

The racism crisis involving Texaco provides a good example of how appropriate reactions can lead to a thorough resolution of a problematic situation. In 1996, secret tape recordings surfaced, containing a conversation between several Texaco executives. Analysis of the conversation revealed intolerant remarks as well as plans to destroy evidence that might help a pending lawsuit against the company by six African-American employees. The publicity generated by the discovery induced calls for boycott and demonstrations in front of Texaco gas stations, clearly threatening its legitimacy as a business organization. However, unlike Exxon or Firestone, Texaco reacted by admitting the inadequate behavior of the executives, seeking outside assistance in corrective action, and agreeing to a multi-million dollar court settlement. The settlement, along with efforts to increase minority promotions within the company as well as contracts with minority-owned businesses, was widely welcomed as a commendable reaction and relieved Texaco of public pressure. Responding to a threat in an accommodative and substantive manner proved successful in overcoming the crisis (Brinson and Benoit, 1999; McLane, Bratic, and Bersin, 1999; Coombs and Schmidt, 2000; Pfarrer et al., 2008).

The results generated by my model also suggest that the delay in organizational reaction to a threatening event is critical in repairing legitimacy. The absence of a response is perceived by stakeholders as inappropriate because they expect the organization to both respect their opinion and actively control its environment. Failing to react therefore reduces organizational legitimacy. Furthermore, stakeholder skepticism increases, making eventual efforts to restore legitimacy less effective. Again, the cases of Exxon, Firestone, and Texaco allow for comparative illustration of these effects. After the Valdez oil spill, Exxon's chairman waited a full week before commenting on the incident. A newspaper ad containing an apology – but no acceptance of responsibility – was run ten days after the ship went aground. This was regarded by the public as far too late a reaction to such a catastrophic event. Consequently, Exxon's already weakened image was further damaged in the eyes of multiple stakeholder

groups, as described above (Benoit, 1995; McLane, Bratic, and Bersin, 1999). Firestone acknowledged problems associated with its tires only when reports on numerous fatalities were published. Yet, as was revealed, the company had concealed knowledge about the defects for 3 years. In addition, negative evaluation by the American public was particularly strong because product recalls were initiated in the US after other countries, and were spread out over 18 months (Blaney, Benoit, and Brazeal, 2002). Again, failure to address the problem immediately exacerbated the crisis considerably for the affected organization. Texaco, by comparison, reacted much more effectively. The company's chairman listened to the evidentiary tape recordings personally and swiftly issued a personal public apology. This strategy led to media coverage of the scandal subsiding after just a few weeks and public boycotts being called off. In fact, the crisis had no significant effect on sales (Brinson and Benoit, 1999; McLane, Bratic, and Bersin, 1999; Coombs and Schmidt, 2000).

Although I argue that the results of my study improve our understanding of organizational reactions to crisis, there are some limitations to consider. Most generally, my model has a fairly reduced scope, i.e. narrow boundaries, and is relatively simple. It focuses on the interaction between organization and stakeholders concerning legitimacy after a crisis. More specifically, I do not distinguish between different legitimation activities, but use their intensity as a single-dimension measurement. Literature on legitimacy management, however, proposes a variety of strategies, ranging from defensive to accommodative, and from symbolic to substantial (e.g. Sutton and Callahan, 1987; Ashforth and Gibbs, 1990; Elsbach, 2003). The model also includes only one generic group of stakeholders, although real organizations typically are confronted with multiple stakeholders, often expressing different expectations and demands (Ginzel, Kramer, and Sutton, 1993). I thereby abstracted the model from the setting of the crisis, which in reality has some influence on the development of the interaction and has been suggested to be included in organization studies (Rousseau and Fried, 2001). My model also treats crises as events external to the organization, whereas some causes of crises often lie in the structure and processes embedded within it (e.g. Perrow, 1984; Vaughan, 1990; Pauchant and Mitroff, 1992; Sipika and Smith, 1993). However, the goal of my approach was to capture the core causal processes behind legitimation dynamics, involving the organization and its stakeholder, both of which are often surprised by the occurrence of threatening events (Hermann, 1963; Billings, Milburn, and Schaalman, 1980; Meyer, 1982). This necessitated trading off some degree of realism in favor of comprehensibility and testability (Barlas, 2007).

Despite these limitations, I argue that my study contributes to the literature on organizational crises and legitimation in several respects. First, it points to the importance of incorporating the construct of legitimacy into research on organizational crises. As my results, as well as some of the cases discussed above suggest, organizations can considerably accelerate recovery from a crisis by managing their stakeholders' evaluation because crises are partly constructed in the perception of these stakeholders. Although some studies in the field of management and organization theory have incorporated this aspect (e.g., Elsbach, 1994; Sutton and Callahan, 1987), it has been in the context of crises caused by problematic behavior of the organization. I propose that, even after an obviously external event, such as an industrial accident, the negative impact on the organization involved depends largely on perceptions of its reaction. Second, and more specifically, my model analyzes crises over time and my results suggest *nonlinearity* of the effects of both the nature and timing of organizational responses to crises on the ensuing legitimation dynamics. It is the *interplay* between general skepticism related to the current level of legitimacy as well as perceptions of inappropriateness caused by organizational reactions that shape the path of regaining legitimacy. When approaching the tipping point in defending legitimacy, this interplay extends the time span required to recover. In terms of reaction timing, failing to address stakeholder expectations – be it purposefully or not – may have the same adverse effect, and may erode legitimacy further.

Avenues for future research on the role played by legitimation in organizational crises pertain to the scope of the model, and to empirical studies of past and ongoing crises. The model could be extended by abandoning some of the more restrictive assumptions. For instance, one could introduce a two-dimensional measure of reactive legitimation, or, correspondingly, a more complex assessment of appropriateness by stakeholders. Multiple stakeholder groups could be incorporated, reacting differently to legitimation attempts. As a more significant extension, the notion of resources as an influence on crisis coping could be introduced. As several authors have suggested, resources play an important part in overcoming crises, as the organization can employ 'slack' to fund defensive activities and compensate for diminished income (e.g., Staw, Sandelands, and Dutton, 1981; Hambrick and D'Aveni, 1988; Audia and Greve, 2006). With more general respect to research on organizational crises, more studies could focus on the path of crises in terms of the interaction between organization and stakeholders, and on the effects of the organization's actions on this path. As crises, though rare for individual organizations, occur more and more frequently in a world of increasing complexity, many opportunities for analyzing and understanding them more deeply present themselves.

REFERENCES

Aldrich, Howard E., and C. Marlene Fiol (1994): "Fools rush in? The institutional context of industry creation." Academy of Management Review, 19/4: 645-670.

Arndt, Margarete, and Barbara Bigelow (2000): "Presenting structural innovation in an institutional environment: Hospitals' use of impression management." Administrative Science Quarterly, 45/3: 494-522.

Ashforth, Blake E., and Barrie W. Gibbs (1990): "The double-edge of organizational legitimation." Organization Science, 1/2: 177-194.

Audia, Pino G., and Henrich R. Greve (2006): "Less likely to fail: Low performance, firm size, and factory expansion in the shipbuilding industry." Management Science, 52/1: 83-94.

Axelrod, Robert (1997): "Advancing the art of simulation in the social sciences." In Rosaria Conte, Rainer Hegselmann, and Pietro Terno (eds.), Simulating Social Phenomena: 21-40. Berlin: Springer.

Banks, Jerry (1998): "Principles of simulation." In Jerry Banks (ed.), Handbook of Simulation: 3-30. New York: Wiley.

Barlas, Yaman (2007): "Leverage points to march 'upward from the aimless plateau'." System Dynamics Review, 23/4: 469-473.

Benoit, William L. (1995): Accounts, Excuses, and Apologies: A Theory of Image Restoration Discourse. Albany, NY: State University of New York Press.

Benoit, William L., and Susan L. Brinson (1994): "AT&T: 'Apologies are not enough'." Communication Quarterly, 42/1: 75-88.

Billings, Robert S., Thomas W. Milburn, and Mary Lou Schaalman (1980): "A model of crisis perception: A theoretical and empirical analysis." Administrative Science Quarterly, 25/2: 300-316.

Black, Laura J., Paul R. Carlile, and Nelson P. Repenning (2004): "A dynamic theory of expertise and occupational boundaries in new technology implementation: Building on Barley's study of CT scanning." Administrative Science Quarterly, 49/4: 572-607.

Blaney, Joseph R., William L. Benoit, and LeAnn M. Brazeal (2002): "Blowout!: Firestone's image restoration campaign." Public Relations Review, 28/4: 379-392.

Brinson, Susan L., and William L. Benoit (1996): "Dow Corning's image repair strategies in the breast implant crisis." Communication Quarterly, 44/1: 29-41.

Brinson, Susan L., and William L. Benoit (1999): "The tarnished star: Restoring Texaco's damaged public image." Management Communication Quarterly, 12/4: 483-510.

Bronson, Richard, and Chanoch Jacobsen (1986): "Simulation and social theory." Simulation, 47/2: 58-62.

Burton, Richard M. (2003): "Computational laboratories for organization science: Questions, validity and docking." Computational & Mathematical Organization Theory, 9/2: 91-108.

Carroll, Glenn R., and Michael T. Hannan (2000): The Demography of Corporations and Industries. Princeton, NJ: Princeton University Press.

Coombs, Timothy, and Lainen Schmidt (2000): "An empirical analysis of image restoration: Texaco's racism crisis." Journal of Public Relations Research, 12/2: 163-178.

Dacin, M. Tina (1997): "Isomorphism in context: The power and prescription of institutional norms." Academy of Management Journal, 40/1: 46-81.

Davis, Jason P., Kathleen M. Eisenhardt, and Christopher B. Bingham (2007): "Developing theory trough simulation methods." Academy of Management Review, 32/2: 480-499.

DiMaggio, Paul J., and William W. Powell (1983): "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields." American Sociological Review, 48/2: 147-160.

Donaldson, Thomas, and Lee E. Preston (1995): "The stakeholder theory of the corporation: Concepts, evidence, and implications." Academy of Management Review, 20/1: 65-91.

Dooley, Kevin (2002): "Simulation research methods." In Joel A. C. Baum (ed.), The Blackwell Companion to Organizations: 829-848. Oxford: Blackwell.

Dowling, John, and Jeffrey Pfeffer (1975): "Organizational legitimacy: Social values and organizational behavior." Pacific Sociological Review, 18/1: 122-136.

Dutton, Jane E., and Janet M. Dukerich (1991): "Keeping an eye on the mirror: Image and identity in organizational adaptation." Academy of Management Journal, 34/3: 517-554.

Elsbach, Kimberly D. (1994): "Managing organizational legitimacy in the California cattle industry: The construction and effectiveness of verbal accounts." Administrative Science Quarterly, 39/1: 57-88.

Elsbach, Kimberly D. (2001): "The architecture of legitimacy: Constructing accounts of organizational controversies." In John T. Jost and Brenda Major (eds.), The Psychology of Legitimacy: 391-415. Cambridge, UK: Cambridge University Press.

Elsbach, Kimberly D. (2003): "Organizational perception management." Research in Organizational Behavior, 25: 297-332.

Forrester, Jay W. (1961): Industry Dynamics. Cambridge, MA: MIT Press.

Forrester, Jay W. (1971): "Counterintuitive behavior of social systems." Technology Review, 3/1: 52-68.

Freeman, John, Glenn R. Carroll, and Michael T. Hannan (1983): "The liability of newness: Age dependence in organizational death rates." American Sociological Review, 48/5: 692-710.

Freeman, R. Edward (1984): Strategic Management: A Stakeholder Approach. Boston, MA: Pitman.

Frooman, Jeff (1999): "Stakeholder influence strategies." Academy of Management Review, 24/2: 191-205.

Gilbert, Nigel, and Klaus G. Troitzsch (2005): Simulation for the Social Scientist. Maidenhead, UK: Open University Press.

Ginzel, Linda E., Roderick M. Kramer, and Robert I. Sutton (1993): "Organizational impression management as a reciprocal process: The neglected role of the organizational audience." Research in Organizational Behavior, 15: 227-266.

Hall, Roger I. (1976): "A system pathology of an organization: The rise and fall of the old Saturday Evening Post." Administrative Science Quarterly, 21/2: 185-211.

Hambrick, Donald C., and Richard A. D'Aveni (1988): "Large corporate failures as downward spirals." Administrative Science Quarterly, 33/1: 1-23.

Hanneman, Robert A., Randall Collins, and Gabriele Mordt (1995): "Discovering theory dynamics by computer simulation: Experiments on state legitimacy and imperialist capitalism." Sociological Methodology, 25: 1-46.

Harrison, J. Richard, Zhiang Lin, Glenn R. Carroll, and Kathleen M. Carley (2007): "Simulation modeling in organizational and management research." Academy of Management Review, 32/4: 1229-1245.

Hedberg, Bo L. T., Paul C. Nystrom, and William H. Starbuck (1976): "Camping on seesaws: Prescriptions for a self-designing organization." Administrative Science Quarterly, 21/1: 41-65.

Hermann, Charles F. (1963): "Some consequences of crisis which limit the viability of organizations." Administrative Science Quarterly, 8/1: 61-82.

Hobbs, Jeffrey D, (1995): "Treachery by any other name: A case study of the Toshiba public relations crisis." Management Communication Quarterly, 8/3: 323-346.

Hoffman, Andrew J., and William Ocasio (2001): "Not all events are attended equally: Toward a middle-range theory of industry attention to external events." Organization Science, 12/4: 414-434.

Hudson, Bryant Ashley (2008): "Against all odds: A consideration of core-stigmatized organizations." Academy of Management Review, 33/1: 252-266.

Hulin, Charles L., and Daniel R. Ilgen (2000): "Introduction to computational modeling in organizations." In Daniel R. Ilgen and Charles L. Hulin (eds.), Computational Modeling of Behavior in Organizations: The Third Scientific Discipline: 3-18. Washington, DC: American Psychological Association.

James, Erika Hayes, and Lynn Perry Wooten (2006): "Diversity crises: How firms manage discrimination lawsuits." Academy of Management Journal, 49/6: 1103-1116.

Lin, Ziang, Zhao Xia, Kiran M. Ismail, and Kathleen M. Carley (2006): "Organizational design and restructuring in response to crises: Lessons from computational modeling and real-world cases." Organization Science, 17/5: 598-618.

Lomi, Alessandro, Erik R. Larsen, and Ari Ginsberg (1997): "Adaptive learning in organizations: A system dynamics-based exploration." Journal of Management, 23/4: 561-582.

Marcus, Alfred A., and Robert S. Goodman (1991): "Victims and shareholders: The dilemmas of presenting corporate policy during a crisis." Academy of Management Journal, 34/2: 281-305.

Masuch, Michael (1985): "Vicious circles in organizations." Administrative Science Quarterly, 30/1: 14-33.

McKelvey, Bill (1997): "Quasi-natural organization science." Organization Science, 8/4: 352-380.

McLane, Patrick, Walter Bratic, and Brent K. Bersin (1999): "Potentially devastating events: How three companies managed and survived a crisis." Corporate Reputation Review, 2/3: 268-277.

Meyer, Alan D. (1982): "Adapting to environmental jolts." Administrative Science Quarterly, 27/4: 515-537.

Meyer, John W., and Brian Rowan (1977): "Institutionalized organizations: Formal structure as myth and ceremony." American Journal of Sociology, 83/2: 340-363.

Meyer, John W., and W. Richard Scott (1983): "Centralization and the legitimacy problems of local government." In John W. Meyer and W. Richard Scott (eds.), Organizational Environments: Ritual and Rationality: 199-215. Beverly Hills, CA: Sage.

Milburn, Thomas W., Randall S. Schuler, and Kenneth H. Watman (1983): "Organizational crisis. Part I: Definition and conceptualization." Human Relations, 36/12: 1141-1160.

Mitroff, Ian I., Thierry Pauchant, Michael Finney and Christine Pearson (1989): "Do (some) organizations cause their own crises? The cultural profiles of crisis-prone vs. crisis-prepared organizations." Organization & Environment, 3/4: 269-283.

Musselman, Kenneth, J. (1998): "Guidelines for success." In Jerry Banks (ed.), Handbook of Simulation: 721-744. New York: Wiley.

Oliver, Christine (1991): "Strategic responses to institutional processes." Academy of Management Review, 16/1: 145-179.

Pauchant, Thierry, and Ian I. Mitroff (1988): "Crisis prone versus crisis avoiding organizations. Is your company's culture its own worst enemy in creating crises?" Organization & Environment, 2/1:53-63.

Pauchant, Thierry, and Ian I. Mitroff (1992): Transforming the crisis-prone organization. San Francisco, CA: Jossey-Bass.

Pearson, C. M., and J. A. Clair (1998): "Reframing crisis management." Academy of Management Review, 23/1: 59-76.

Perlow, Leslie A., Gerardo A. Okhuysen, and Nelson P. Repenning (2002): "The speed trap: Exploring the relationship between decision making and temporal context." Academy of Management Journal, 45/5: 931-955.

Perrow, Charles (1984): Normal Accidents: Living with High-Risk Technologies. New York: Basic Books.

Pfarrer, Michael D., Katherine A. Decelles, Ken G. Smith, and M. Susan Taylor (2008): "After the fall: Reintegrating the corrupt organization." Academy of Management Review, 33/3: 730-749.

Pfeffer, Jeffrey (1981): "Management as symbolic action: The creation and maintenance of organizational paradigms." Research in Organizational Behavior, 3: 1-52.

Pollock, Timothy G., and Violina T. Rindova (2003): "Media legitimation effects in the market for initial public offerings." Academy of Management Journal, 46/5: 631-642.

Pool, Robert (1992): "The third branch of science debuts." Science, 256: 44-47.

Randers, Jørgen (1980): "Guidelines for model conceptualization." In Jørgen Randers (ed.), Elements of the System Dynamics Method: 117-139. Cambridge, MA: MIT Press.

Repenning, Nelson P. (2002): "A simulation-based approach to understanding the dynamics of innovation implementation." Organization Science, 13/2: 109-127.

Richardson, George P. (1991): Feedback Thought in Social Science and Systems Theory. Philadelphia: University of Pennsylvania Press.

Roberts, Karlene H. (1990): "Some characteristics of one type of high reliability organization." Organization Science, 1/2: 160-176.

Robinson, Stewart (2004): Simulation: The Practice of Model Development and Use. Chichester: Wiley.

Rudolph, Jenny W., and Nelson P. Repenning (2002): "Disaster dynamics: Understanding the role of quantity in organizational collapses." Administrative Science Quarterly, 47/1: 1-30.

Rousseau, Denise M., and Yitzhak Fried (2001): "Location, location, location: Contextualizing organizational research." Journal of Organizational Behavior, 22/1: 1-13.

Roux-Dufort, Christophe (2007a): "Is crisis management (only) a management of exceptions?" Journal of Contingencies and Crisis Management, 15/2: 105-114.

Roux-Dufort, Christophe (2007b): "A passion for imperfections: Revisiting crisis management." In Christine M. Pearson, Christophe Roux-Dufort, and Judith A. Clair (eds.), International Handbook of Organizational Crisis Management: 221-252. Thousand Oaks, CA: Sage.

Salancik, Gerald R., and Jamed R. Meindl (1984): "Corporate attributions as strategic illusions of management control." Administrative Science Quarterly, 29/2: 238-254.

Sastry, M. Anjali (1997): "Problems and paradoxes in a model of punctuated organizational change." Administrative Science Quarterly, 42/2: 237-275.

Sastry, M. Anjali (2001): "Understanding dynamic complexity in organizational evolution: a system dynamics approach." In Alessandro Lomi and Erik R. Larsen (eds.), Dynamics of Organizations: Computational Modeling and Organization Theories: 377-404. Menlo Park: American Association for Artificial Intelligence.

Schlenker, Barry R. (1980): Impression Management. Belmont, CA: Wadsworth.

Shrivastava, Paul (1992): Bhopal: Anatomy of a Crisis. London: Paul Chapman.

Shrivastava, Paul, Ian I. Mitroff, Danny Miller, and Anil Miglani (1988): "Understanding industrial crises." Journal of Management Studies, 25/4: 285-303.

Siggelkow, Nicolaj (2007): "Persuasion with case studies." Academy of Management Journal, 50/1: 20-24.

Sipika, Chris, and Denis Smith (1993): "From disaster to crisis: The failed turnaround of Pan American Airlines." Journal of Contingencies and Crisis Management, 1/3: 138-151.

Smart, Carolyne, and Ilan Vertinsky (1977): "Designs for crisis decision units." Administrative Science Quarterly, 22/4: 640-657.

Smart, Carolyne, and Ilan Vertinsky (1984): "Strategy and the environment: A study of corporate responses to crises." Strategic Management Journal, 5/3: 199-213.

Staw, Barry M., Lance E. Sandelands, and Jane E. Dutton (1981): "Threat-rigidity effects in organizational behavior: A multilevel analysis." Administrative Science Quarterly, 26: 501-524.

Sterman, John D. (2000): Business dynamics. New York: McGraw-Hill.

Sterman, John D., Nelson P. Repenning, and Fred Kofman (1997): "Unanticipated side effects of successful quality programs: Exploring a paradox of organizational improvement." Management Science, 43/4: 503-521.

Stinchcombe, Arthur L. (1965): "Social structure and organizations." In James G. March (ed.), Handbook of Organizations: 153-193. Chicago, IL: Rand McNally.

Suchman, Mark C. (1995): "Managing legitimacy: Strategic and institutional approaches." Academy of Management Review, 20/3: 571-610.

Sutton, Robert I., and Anita L. Callahan (1987): "The stigma of bankruptcy: Spoiled organizational image and its management." Academy of Management Journal, 30/3: 405-436.

Sutton, Robert I., and Barry M. Staw (1995): "What theory is not." Administrative Science Quarterly, 40/3: 371-384.

Tedeschi, James T., and Valerie Melburg (1984): "Impression management and influence in the organization." Research in the Sociology of Organizations, 3: 31-58.

Turner, Barry A. (1976): "The organizational and interorganizational development of disasters." Administrative Science Quarterly, 21/3: 378-397.

Vaughan, Diane (1990): "Autonomy, interdependence, and social control: NASA and the space shuttle Challenger." Administrative Science Quarterly, 35/2: 225-257.

Vaughan, Diane (1999): "The dark side of organizations: Mistake, misconduct, and disaster." Annual Review of Sociology, 25: 271-305.

Weick, Karl E. (1988): "Enacted sensemaking in crisis situations." Journal of Management Studies, 25/4: 305-317.

Weick, Karl E. (1990): "The vulnerable system: An analysis of the Tenerife air disaster." Journal of Management 16/3: 571-593.

Weick, Karl E. (1993): "The collapse of sensemaking in organizations: The Mann Gulch disaster." Administrative Science Quarterly, 38/4: 628-652.

Weick, Karl E., Kathleen M. Sutcliffe, and David Obstfeld (1999): "Organizing for high reliability: Processes of collective mindfulness." Research in Organizational Behavior, 21: 81-123.

Westphal, James D., and Edward J. Zajac (1998): "The symbolic management of stockholders: Corporate governance reforms and shareholder reactions." Administrative Science Quarterly, 43/1: 127-153.

Yu, Tieying, Metin Sengul, and Richard H. Lester (2008): "Misery loves company: The spread of negative impacts resulting from an organizational crisis." Academy of Management Review, 33/2: 452-472.

Zimmerman, Monica A., and Gerald J. Zeitz (2002): "Beyond survival: achieving new venture growth by building legitimacy." Academy of Management Review, 27/3: 414-431.

Zucker, Lynne G. (1987): "Institutional theories of organization." Annual Review of Sociology, 13: 443-464.