Organizing for Transient Reliability: The Production of Dynamic Non-Events

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Reliability is portrayed as a situation-specific localized accomplishment that involves continuous management of significant contradictions that are susceptible to interruption. Managing for higher reliability is precarious because it involves the substitution of a conceptual order for a perceptual order. Discrete concepts simplify and lag behind continuous perceptions, which means that our grasp of events is subject to mis-specification, misidentification, and misunderstanding. The gap between discrete concepts and continuous perceptions can be reduced if attention is organized so that it is directed at failures, simplifications, operations, resilience, and expertise. These micro-dynamics are discussed as a partial infrastructure that underlies Todd LaPorte's more macro-concerns with strategy and structure in the quest for failure-free interorganizational performance.

1. Introduction

Two assertions frame the following analysis. The first assertion is that reliability is a moving target and therefore transient. The second is that reliability is a dynamic non-event and therefore continuously reaccomplished. Given this framing, the question arises, how do people organize in order to continuously produce non-events (nearly failure-free performance) when the nature of a non-event keeps changing? Todd LaPorte (1996, p. 61) posed a similar question: 'What patterns of relationships and organizational dynamics characterize HRO (high reliability organization) performance, especially in demanding environments'. La-Porte (1996, p. 62) subdivided that broad question into three specific questions that help define the high reliability project:

1. 'What patterns of formal organization structure and rules have developed in response to these requirements under conditions of restrained resources … . What are the patterns of interdependencies associated with units requiring reliability?'
2. 'What decision making and communication dynamics evolve in the processes of day to day planning and operation when contingencies are expected but their specifics are unpredictable?'
3. 'What group norms are evident within and between units requiring reliability in relations with and obligations to, group members and to the organization as a whole?'

These three questions continue to haunt LaPorte and they form the spine that anchors his important recent work on terrorism and predatory futures (e.g., LaPorte, 2006, 2007).

I am interested in question 2 and address it using a cognitive social psychology perspective that complements LaPorte's thinking. For example, my discussion provides an operations counterpoint to LaPorte's policy interest, a micro-complement at the unit level of analysis to his macro-analyses at the organizational level, a cognition-intensive focus to round out his technology-intensive focus, a preoccupation with brief periods of time compared to his preoccupation with extended periods, and descriptions of tactics to fill in his descriptions of strategy. LaPorte's ideas provide a platform that I want to extend. This is one small way that I can pay tribute to a provocative scholar and his stunning scholarship.

2. Decisions as blindspots

To explore Question 2 I began by studying failures and successes in wildland firefighting crews (e.g., Keller, Weick, Sutcliffe, Saveland, Lahey, Thomas, & Nasiatka, 2004; Weick, 1993, 1995; Weick & Sutcliffe, 2007, p. 3–22). The people in these crews, much like the people LaPorte observed, dealt with expected but unpredictable contingencies in settings that were organized, demanding, hazardous, interdependent, unpredictable, bound by norms, and threatened by events that had to be precluded. Sometimes their suppression

efforts failed and fires escaped causing immense damage and/or fatalities (e.g., Cerro Grande Fire, Dude Fire). Sometimes their efforts are much more successful, although successes are less well documented.

Among my early informants was one of the most respected crew superintendents, the late Paul Gleason (e.g., Gleason, 1991). Gleason drew my attention to a distinctive way in which the dynamics of high reliability organization (HRO) decision making 'evolved in the processes of day to day planning and operation' (Question 2 above). More reliable fire suppression in the face of fluctuations in the fire itself occurred when the crew and its leader directed significant attention away from decision making toward the activity of sensemaking (e.g., 'Did you notice that the winds have suddenly stopped?' This stoppage is a possible sign that updraft winds have produced a column of smoke that is so heavy that it is about to drop, producing downdraft winds that push the fire in all directions). Gleason described the shift from decisions to sensemaking this way:

> If I make a decision it is a possession, I take pride in it, I tend to defend it and not to listen to those who question it. If I make sense, then this is more dynamic and I listen and I can change it. A decision is something you polish. Sensemaking is a direction for the next period.

Decisions tend to be laboured over, refined, and polished (e.g., Brunsson, 1982). Once they are made, decisions can become 'possessions' that are justified and defended rather than re-examined (Salancik, 1977; Weick & Sutcliffe, 2003). Gleason was insistent that he wanted to avoid the stasis those problems create and instead to allow his directions to remain 'dynamic' so that his crew could cope with a changing fire environment. When Gleason articulated a sense of the situation and provided a 'direction for the next period', his attack on the fire remained flexible. The 'next period' in a wildland fire, as in any episode that threatens reliable performance, is a finite period of unpredictable duration and complexity. As the 'next period' becomes the 'present period', it may make less and less sense (e.g., 'Should these flame heights be this high, this early in the day?'). When a direction begins to lose sensibleness, it is typically easier to update that sense than to undo a decision. This differential in flexibility and speed can facilitate staying attuned to dynamic environments. A decision that has been polished and justified tends to create pride and advocacy rather than listening and updating.

Gleason's preference for sensemaking to preserve reliable performance can be understood from a different perspective. Discussions of decision making sometimes overlook the fact that, 'to "decide" *presupposes* previous consideration of a *matter causing doubt* . . . and implies the arriving at a *more or less logical* conclusion that brings doubt to a *momentary* end' (Webster's New Dictionary of Synonyms, 1984, p. 215, italics added).

Four phrases in that definition have a bearing on the dynamics of decision making in the context of reliable performance. 'Presupposes' implies something prior to decision making and I would argue that one of the things that is presupposed is a process of sensemaking (e.g., Allard-Poesi, 2005; Patriotta, 2003). 'A matter causing doubt' implies that what precedes decision making is some kind of interruption, unexpected event (e.g., Blatt, Christianson, Sutcliffe, Rosenthal, & Marilyn, 2006; Kramer, 2007), or what LaPorte calls 'contingencies whose specifics are unpredictable'. 'More or less logical' implies a workable level of certainty (Weick, 1969, p. 40) that is plausible and resolves some of the doubt in the context where it is crafted. Finally, the idea that sensemaking 'brings doubt to a *momentary* end' suggests that the sense which shapes reliable performance may not last very long before new doubts arise, current presuppositions are reexamined, and newer suppositions are adopted to restore reliable performance.

3. Interruptions and reliable performance

If doubt threatens reliable performance, what is the nature of 'a matter causing doubt?' John Dewey (1922, pp. 178–179) provides a partial answer:

> In every waking moment, the complete balance of the organism [system] and its environment is constantly interfered with and as constantly restored . . . . Life is interruptions and recoveries . . . At these moments of a shifting in activity, conscious feeling and thought arise and are accentuated.

Several phrases in this quotation deepen our understanding of what bothers Gleason. The ongoing activity that gets interrupted consists of the 'balancing' of an organism and its environment (the gerund 'balancing' is crucial to capture the transience of reliable performance). That sweeping description of balance between organism and environment can be made more specific if we describe possible components that are balanced and possible ways in which balance is accomplished. HROs strive for a balance between components such as principles and experience, anticipation and resilience, input and demand, routine and non-routine, flux and order. HROs accomplish balance by such means as switching back and forth between the poles of an opposition (e.g., T.M. LaPorte, 2006, p. 143), by simultaneous expression in different parts of a system, by blending some of each pole into a composite response, by continuous adjusting (think of a tight rope walker using a balance pole continuously to correct a momentary imbalance), by dissolving the duality itself (Farjoun, 2010), by removing 'balance' as an aspiration or as a meaningful category, or by a standoff (e.g., 'the higher up or farther outside you go from the control room, the more likely anticipation and resilience are to be functionally set at cross purposes', Roe & Schulman, 2008, p. 125).

Regardless of how balance is specified and attempted, sustained balance is one way to describe reliable performance. The ongoing activity of balancing is often highlighted in discussions of HROs. For example, LaPorte (2006, p. 150) observes that 'organization leaders should seek to strike a *balance* between strategies that emphasize anticipation with those that emphasize resilience'. Roe and Schulman (2008) describe efforts to '*balance* learning by trial and error with prevention of high risk mistakes', '*balancing* . . . between the general principles and deductive orientation of designers and the case-by-case, experience-based preoccupation of field operators', and the imperative to 'preserve *balances* needed for resilience and anticipation in a complex technical system' (italics added, pp. 7–8). When balance is interrupted, cognition and feeling arise and turn a non-event into an event. As we will see shortly, when this happens both discrete concepts and continuous perceptions become more apparent.

The emerging picture is that of a basic pattern in everyday life that persists when contexts become much more hazardous [see Roe & Schulman's (2008, p. 138) discussion of real-time reliability]. The basic pattern is one of interruption and recovery. Interruptions are not themselves failures, but they can ramify and enlarge, especially considering that the hallmark of HROs is their 'palpable technical and social interdependence' (LaPorte, 1996, p. 63). What is distinctive about units that strive for failure-free performance is that they expect interruptions, identify the specifics of what the interruption will unbalance, look for early warning signs of things going wrong, and develop broader capabilities for recovery. Failure-free performance still involves decision making, as it does in everyday life. But attention to sensemaking is more important in HR organizing since early detection of failure speeds up recovery and reduces the magnitude of action that is necessary to accomplish it. When sense is modified and updated, it points to directions that move away from interruptions. The persistence of this basic pattern across settings that vary in hazard is often reiterated by HRO practitioners. For example, Joe Martin, retired Battalion Chief of the Los Angeles City Fire Department observed that 'What you do every day is what you do in an emergency'.[1]

4. Concepts and perceptions as a structure for reliable performance

If we look more closely at the conscious feeling and thought that become accentuated during an interruption, we find a disjunction that can undermine failure-free work. The raw materials for Dewey's 'conscious feeling and thought' are perceptions and conceptions. 'The great difference between percepts and concepts is that percepts are continuous and concepts are discrete' (James, 1996, p. 48). Discrete concepts imposed on ongoing perceptions, typically lag behind what is observed to have just occurred. Discrete categories are usually imposed a little too late and because of their discreteness, miss some of the continuing change. Events are always a little farther along and a little different than we imagine. This means that our experience of reliable performance in real time always carries with it some mis-specification due to our reliance on concepts. '(A)ttention carves out objects, which conception *then* (i.a.) names and identifies forever – in the sky "constellations", on the earth "beach", "sea", "cliff", "bushes", "grass"'. Out of time we cut 'days' and 'nights', 'summers' and 'winters'. We say *what* each part of the sensible continuum is, and all of these abstracted *whats* are concepts. *The intellectual life of man consists almost wholly in his substitution of a conceptual order for the perceptual order in which his experience originally comes*' (James, 1996, pp. 50–51, italics in original). Failure-free performance depends not just on one's capability for recovering from interruptions, but also on how a 'conceptual order' is substituted for a 'perceptual order'. Cognitively, reliable performance depends on making the conceptual substitutions more dynamic, more visible for possible reframing, and less sweeping.

This somewhat odd set of requirements for conceptual substitutions that foster high reliability, can be explained as follows. We start with the work of Baron and Misovich (1999) who distinguish between knowledge by acquaintance and knowledge by description. They argue that sensemaking starts with active exploration which generates knowledge by acquaintance. Active exploration involves bottoms-up, stimulus-driven, on-line cognitive processing in order to take action. Names, labels, categories are secondary to this hands-on processing. However, names become more important when interdependent people need to coordinate their actions (Rochlin, LaPorte, & Roberts, 1987; Weick & Roberts, 1993). In the interest of coordination and communication, people impose discrete but shared concepts on the continuous perceptual flow. They begin to develop knowledge by description rather than knowledge by acquaintance. Their cognitive processing now becomes schema-driven rather than stimulus-driven, people go beyond the information given, and they simplify their direct perceptions into types, categories, stereotypes, and schemas.

The shift toward knowledge by description is essential for organizing. At the same time it poses a problem for HROs since description often removes distinctive features. The centrality of knowledge by description for organizing is highlighted by Hari Tsoukas (2005, p. 124): 'Organizing implies generalizing; the subsumption of heterogeneous particulars [knowledge by acquaintance] under generic categories [knowledge by description]'. Tsoukas continues, 'For an activity to be said to be organized implies that types of behaviour in types of situations are connected to types of actors . . . . An organized activity provides actors with a given set of cognitive categories and a typology of action options. In that sense, formal organization necessarily involves abstraction'. The very same abstractions that hold HROs together can impede their ability to sense and manage LaPorte's 'unpredictable specifics'.

Baron and Misovich (1999, p. 587) call the potential conflict between acquaintance and description a 'shareability

constraint'. Informally, this constraint means that if people want to share their cognitive structures, those structures have to take on a particular form. More formally, this constraint means that as social complexity increases, interdependent people substitute categorically based knowing for perceptually based knowing in the interest of coordination. The potential cost of these substitutions is the loss of discriminatory detail. As the demands for coordination increase, labels rather than observed details have more impact on perception. If significant details occur that lie outside the domain of these shared names – as is likely in the case of 'unpredictable specifics' – then interdependent people will be the last to see them (e.g., Roux-Dufort, 2009). To reduce the shareability constraint people organize in ways that loosen interdependency, increase self-organization of smaller units (e.g., the ad hoc problem solving teams in Rochlin et al., 1987), and trust those who report that 'something doesn't feel right here' even though that feeling cannot be described in shared categories (see Tom Mercer's description of 'leemers' as in 'leery of' in Weick & Sutcliffe, 2007, p. 41).

5. Words and reliable performance

Everything that has been discussed up to this point involves words and the process of sensemaking. 'Sensemaking involves turning circumstances into a situation that is *comprehended explicitly in words* and that serves as a springboard for action' (Taylor & Van Every, 2000, p. 40, italics added). In the preceding sentence, 'circumstances' = continuous perceptions, 'comprehended explicitly in words' = discrete concepts. Words make the disorder of an interruption into something that becomes more thinkable and controllable. We see what our concepts single out (believing is seeing) and we conceptualize what we see singled out (seeing is believing).

Here's an example of how words convert circumstances into a situation that is a springboard for action. Crew chiefs in wildland firefighting often brief firefighters using a protocol summarized in the acronym, STICC (Klein, 2003, pp. 201–207).

1. *Situation*: here's what I think we face.
2. *Task*: here's what I think we should do.
3. *Intent*: here's why I think we should do that.
4. *Concern*: here's what we should keep our eyes on since, if that changes, we're in a new ballgame.
5. *Calibrate*: now talk to me.

This protocol is an example of public sensemaking that puts conscious feeling and thought into words. The protocol gives the crew a framework, a shared vocabulary, a heads-up that the situation is dynamic and unfolding, cues that could signal a situational change, and a chance to weigh in with their own observations. But what may be most important about this protocol is a point that I missed until Fire Manager David Allen mentioned it. When the person doing the briefing says, here's what I think we face, he or she acknowledges a degree of uncertainty in the direction being given. This is the same point that Paul Gleason made when he expressed a preference to give a direction for the next period that could be revised. While it is unsettling to admit uncertainty, that admission builds trust (e.g., Weick, 2001). When a non-event suddenly becomes an event, circumstances do become more confusing and uncertain. To brief as if this were not the case would be to lose credibility.

Practitioners have a potentially large set of resources to help them make sense when non-events become events. Among these resources are seven that recur in studies of sensemaking (Weick, Sutcliffe, & Obstfeld, 2005). Perceptions, conceptions, and the strength and frequency with they are cycled and updated, vary as a function of the following:

1. social relations that are encouraged and discouraged,
2. identities that are valued or derogated,
3. retrospect as an accepted or discredited source of data,
4. cues that are highlighted or suppressed,
5. ongoing updating that is encouraged or discouraged,
6. plausibility or accuracy as the standard to which conjectures are held, and
7. enacting or reacting as the preferred mode of coping.

The way people are organized favours one or the other end of each of these seven dimensions. The end that is favoured, in turn, affects balancing of flux and order, substitution of conceptions for perceptions, and updating in real-time situations. These effects may be produced by leadership style (Hannah, Uhl-Bien, Avolio, & Cavarretta, 2009), cultural practices (Hopkins, 2005), or training (Cannon-Bowers & Salas, 1998). Regardless of the pathway, a profile of sensemaking resources will have been created and nearly failure-free performance will have been made more or less possible.

6. Mindful organizing for high reliability

To organize for higher reliability is to weaken the shareability constraint and strengthen the impact of knowledge by acquaintance. But such modifications cannot simply do away with concepts. In order to see something we need concepts. As Kant (cited in Blumer, 1969, p. 168) made clear, perception without conception is blind but conception without perception is empty and non-actionable. HROs see what they believe, believe what they see, and are effective to the extent that they are mindful of the balance between knowledge acquired through acquaintance and description. They train for and develop both sides of the balance, both their discriminatory labels and their continuous noticing. This is essentially a balance between the general and the particular, the social and the solitary, with extremely high stakes.

HROs seem to avoid blind perceptions and empty conceptions with a distinctive style of operating. HROs pay more attention to failures than success, avoid simplicity

rather than cultivate it, are just as sensitive to operations as they are to strategy, organize for resilience as well as anticipation, and allow decisions to migrate to experts wherever they are located (Weick, Sutcliffe, & Obstfeld, 1999). These may sound like odd ways to make good decisions, but decision making is not what HROs are most worried about. Instead, they are more worried about making sense of the unexpected. In that context, these ways of operating are effective. People are able to preserve detail, refine distinctions, create new categories, draw attention to context, and guard against mis-specification, mis-estimation, and mis-understanding (Schulman, 2004). This HRO operating style also supplies the dynamics that attenuate interruptions, convert small disturbances back into non-events, and preserve ongoing activity. When organizations begin to ignore this operating style, performance becomes less reliable because people (1) fail to spot early warning signals that discrepancies are developing, (2) over-emphasize similarities with past experience (e.g., NASA labels *Columbia* shuttle damage as familiar and 'almost in-family', Starbuck & Farjoun, 2005), (3) lose touch with current operations, (4) are reluctant to make do, improvise and construct workarounds, and (5) tighten authority relationships rather than relax them in favour of deference to expertise.

To manage this style of operating, people in HROs respect and protect managerial attention. HROs expend extraordinary effort 'sustaining attention or watchfulness over long periods of time and getting the right response at the right time' (T.M. LaPorte, 2006, p. 152). Karlene Roberts and I (1993, p. 374) made a similar point when we described ongoing operations on the flight deck of aircraft carriers as a 'struggle for alertness'. In an odd sense, a well-functioning HRO doubts that it is highly reliable. Attention, watchfulness, and alertness are complex activities as Robert Chia (2005, p. 1092) makes clear: 'Managing is firstly and fundamentally the task of attending to, sorting out, and prioritizing an inherently messy world of competing demands that are placed on a manager's attention … . Active perceptual organization and the astute allocation of attention is a central feature of the managerial task'. 'Attention' and 'attending' point to the dynamics of perception and knowledge by acquaintance. 'Sorting out messes of competing demands' is the work of conceptualization and knowledge by description. The 'competing demands' themselves are the site of balancing. And 'prioritizing', 'active perceptual organization', and 'astute allocation of attention' are the means by which managers cycle back and forth between perceptions and conceptions. The goal of all of these deployments of attention is to attenuate interruptions and restore the normal natural flux of reliable performance.

7. Conclusion

This essay is titled, 'Organizing for transient reliability: the production of dynamic non-events'. Reliability is transient in the sense that it is situation-specific and a localized accomplishment (Weick et al., 1999, p. 86). Reliability is a dynamic non-event in the sense that it involves continuous management of fluctuations through restoring interrupted balances. Reliable performance itself is an ongoing activity of balancing significant contradictions. The reaccomplishment of interrupted balance is precarious because it involves the substitution of a conceptual order for a perceptual order. That can create problems. Discrete concepts simplify and lag behind continuous perceptions which means that our grasp of events is subject to mis-specification, misidentification, and misunderstanding (Schulman, 2004). While we strive for accuracy in our substitutions, the best we can hope for are increasingly plausible explanations that incorporate an increasing number of details while still allowing us to move on. That gap between discrete concepts and continuous perceptions can render groups vulnerable to unexpected particulars, which in the case of high reliability organizations, can be deadly. High reliability means narrowing the size of that gap as much as possible. That narrowing is achieved when people organize in such a way that actions attenuate interruption and concepts differentiate rather than conceal small differences in perception. When attention is organized so that it is directed at failures, simplifications, operations, resilience, and expertise, conceptual substitutions reconcile anticipation with resilience.

Thus, a partial answer to LaPorte's question 2 is that dynamic adjusting occurs during moments of interruption and is as much about sensemaking as it is about decision making. In an odd way, we end where we started, with firefighting as our analogue. Firefighting in managing high reliability organizations like electrical power grids (Roe & Schulman, 2008, p. 37), like firefighting in wildland settings, is focused on sequences involving activity-interruption-recovery. During these sequences, perception-conception links and sensemaking become accentuated and available for intentional action. Intentional action converts the interruption into a non-event and activity is restored. This dynamic adjusting is facilitated in HROs in part because they are routinely preoccupied with detection of small failures, reluctant to simplify their interpretations of what may be happening, sensitive to operations and what they are actually accomplishing, committed to resilience in the form of re-direction, improvisation, and workarounds, and continually on the lookout for expertise found outside of the chain of command.

If higher reliability is produced by ongoing management of interruptions by using discrete concepts and knowledge by description, then HROs and HRO organizing may not be as unique as they are sometimes portrayed. HROs are preoccupied with significant interruptions, but their attention to interruptions reappears in more modest form in all of organized life. That's not meant as heresy. Instead, it simply affirms a basic quality in reliable functioning. When principles of HRO are described to people they often say, 'we're already doing it'. That statement may mean that people

have no idea what they're doing or how well or how poorly they're acting like HROs. But that same statement can also mean that they are engaged in practices that, while called something different, also manage interruptions and recoveries mindfully. The ideas discussed above suggest leverage points where reliable performance can be improved in settings that vary widely in hazard and risk. Conscious thought and feeling discussed respectfully with trust, trustworthiness, and self-respect as the prevailing norms (Campbell, 1990; LaPorte & Metlay, 1996), provide a powerful means to conduct trials without error regardless of the magnitude of the trial.

Language such as that used in this analysis and in those analyses conducted by LaPorte, allows practitioners to put their thoughts about reliable work into words so that they can have richer conversations about higher reliability. The HRO project prepares people for what they do not see and do not know. The project is as much about building capacity as it is about solving problems. Todd LaPorte's work teaches this lesson and many more.

Acknowledgements

Note

1. Available at http://www.high-reliability.org/Sayings.html

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