

Strategic Planning in Turbulent Environments: A Social Ecology Approach to Scenarios

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Abstract

We contrast conventional strategic approaches derived from neoclassical economics with a socio-ecological approach to strategy. We propose that the socio-ecological approach, and specifically the causal textures theory of organizational environments it spawned, helps strategic planners to better engage unpredictable uncertainty that characterizes turbulent environments. To support our argument, we render explicit three principles that have been implicit in causal textures theory. We articulate general strategic planning stances for organizations consistent with each of the three principles, and demonstrate how scenario planning can help to instantiate each principle. We conclude that causal textures theory helps strategic planners to better understand the purpose of scenario planning and helps to guide them on how to make use of scenario planning to effect better strategies in a turbulent environment.

Keywords: Environment uncertainty; High velocity environment; Inter-organizational relationships; Organizational Ecology; Stakeholder theory

Introduction

Research on uncertainty located in the context or environment in which organizations are situated has a long and rich intellectual history, not only in the strategic planning field, but also in the decision-making and organization-design literatures. Within organization studies it goes back at least to Emery and Trist's (1965) "causal texture of organizational environments" and Thompson's *Organizations in Action* (1967). But there is no consensus on what uncertainty is, nor on what it means for strategic planners. Without intending to oversimplify the concept, uncertainty as studied in the field of strategic planning has been considered from two different perspectives: the dominant neoclassical approach and the less well-known socio-ecological one, both of which we discuss below.

This paper uses the socio-ecological approach to highlight aspects of uncertainty that the conventional neoclassical approach has downplayed or neglected. In so doing, the paper proposes that when organizations face turbulent contextual conditions (Emery and Trist, 1965; McCann and Selsky, 1984; Ramírez et al., 2008, 2010), it is advisable for them to reorient how they consider uncertainty in their strategic planning (Knight, 1921; Emery, 1977; Ramírez and Ravetz, 2011). Specifically, the paper proposes that the difference between neoclassical and socio-ecological approaches extends to how they consider scenario planning, and that a socio-ecological approach toward scenario planning can help them achieve this reorientation, and thereby improve their strategic planning. Scenario planning has been used to engage uncertain contexts since the 1940s in policy and military arenas, and since the 1960s in corporate strategy (Kahn, 1962; Berger, 1964; Wack, 1985; Schwartz, 1991; van der Heijden, 1996; Lessourne and Stoffaers, 2001; Wright et al., 2013).

The central purpose of this paper is to substantiate the value of using a socio-ecological approach to strategy in turbulent environments. Social ecology has to date elaborated only weakly on the strategic implications of its concepts. We help to redress this weakness in this

paper. As a complement to this central purpose, we intend to demonstrate why and how scenario planning can be used for strategic planning in turbulent environments.

Organizational scholars using social ecology concepts have been dealing with turbulence on a conceptual and a practical basis for nearly fifty years. They have learned that turbulence is neither as monolithic nor as fatal as it appeared in Emery and Trist's original 1965 article. In this paper, we gather this learning and codify it into three "principles" about the turbulent causal texture of organizational environments which have lain latent in that approach up to now. We then draw out strategic planning implications for each one, which, our analysis suggests, enriches strategic thinking. We close by suggesting that these principles are articulated through how social ecology understands scenario planning.

Despite considerable research, the role of scenario planning, and how effective it is in strategic planning remains contested (see Postma and Liebel, 2005). In this paper we build on prior research seeking to relate scenario planning with social ecology concepts (van der Heijden, 2005; Ramírez et al., 2008) by showing how scenario methods add to the repertoire of strategy tools suited to a turbulent environment.

Our analysis thus offers a twofold contribution: First, we shed light on aspects of uncertainty which conventional (i.e., neoclassically based) strategic planning approaches tend to downplay, but which are important in turbulent environments. Second, we provide a conceptually robust basis for why and how scenario planning can help strategic planners to address those neglected aspects advantageously in their strategic planning. Ultimately, our demonstration of how scenario planning practices can enrich strategic planning advances both organizational theorizing about the environment and strategy scholars' search for effective models in turbulent contexts.

This paper is organized as follows. First, we overview the main features of the dominant neoclassical approach to strategic planning, and contrast these with the features of the socio-

ecological approach. We then overview causal textures theory (CTT)—the part of the social ecology school we concentrate on. We describe how CTT deals with unpredictable uncertainty and how it situates “turbulence” as a distinct type of organizational environment. We then advance CTT’s notion of the “turbulent causal texture” by identifying and explicating three principles that have so far remained implicit in CTT. We suggest that strategic planning initiatives to engage turbulent environments can be informed by each of these principles; then, we show how scenario planning as understood in the socio-ecological approach can aid such initiatives. We close by demonstrating that the CTT-scenario planning relationship is symbiotic, both theoretically and in practice; that is, CTT is enriched by what scenario planning brings to it, and scenario planning is given a solid foundation by CTT.

Contrasting Two Approaches in Strategic Planning

For our purposes, strategic planning is a process that supports the creation of future value through the identification, definition, production, assessment and application of goals and resources, and by selecting or making one or more chosen market spaces (Normann and Ramírez, 1993). The focus of this paper is strategic planning at the level of the organization as a whole, and/or strategic business units which deliver such value creation. While in some organizations this activity is relegated to specialist staff units, such as business development or corporate planning departments, in other organizations senior managers engage in, or contribute to or decide on formulating and executing strategy. Textbooks often distinguish among corporate level (e.g., portfolio management, diversification), business level (e.g., competitive), and functional level (e.g., operational, human resources, choices) strategic planning. The corporate and business levels are the primary locus of concern in this paper.

The conventional view of strategic planning, with intellectual roots in neoclassical economics, focuses on working with "predictable" uncertainty, which includes supply, demand

and internal process fluctuations (sometimes cyclical) largely resulting from competitive dynamics. Also included are macroeconomic and, increasingly, ecological factors that can be reasonably anticipated. In contrast, a socio-ecological view of strategic planning, with intellectual roots in systems theory and field theory, engages not only with predictable uncertainty but also with Knight's (1921) "unpredictable" uncertainty, including environmental jolts (Meyer, 1982), unforeseen macro-level disruptions and "black swan" events (Taleb, 2007). Below, we outline the contours of these two approaches, a contrast first proposed by Selsky et al. (2007).

In a somewhat simplified, perhaps even caricatured form, conventional neoclassically based strategic planning construes uncertainty as commercial challenges to be surmounted through competitive moves, along one or more of four choice vectors—cost-quality, timing and know-how, entry barriers, and financial resources (D'Aveni and Gunther, 1994). This form of strategic planning assumes perfect rationality and equal access to information among the competitors. The arena of competition is viewed as the industry (*ibid.*)¹, which receives the bulk of the planner's attention, and profit maximization is seen as the goal of each competitor firm engaged in its autonomous strategic pursuits. A more nuanced rendering relaxes the assumptions of perfect rationality and equal information access by acknowledging the constraints of path dependence, as well as the exercise of power and knowledge asymmetries, heterogeneous dynamic capabilities, bounded rationality, behavioral biases, and the possibility of game-changing or "disruptive" innovation moves.

Selsky et al. (2007) argued that even these nuanced forms are no more than extensions of the neoclassical-economics foundation of conventional strategic planning. The problem they saw was that "the neoclassical origins of the strategy discipline ... are insufficiently responsive to the new landscape of strategy that now characterizes many industries" (p. 72). They viewed the popular

¹ Sometimes suppliers, customers, potential entrants and substitutes are also included (Ryall, 2008).

positioning and strategic maneuvering schools as well as the resource-based view one (Mintzberg et al., 2002) as neoclassical approaches, because all emphasize competitive activity among a group of peers (usually firms in the same industry), and to be played as a zero sum game (Denning, 2012). Moreover, efforts toward strategic renewal and the development of dynamic capabilities tend to be directed toward each focal firm's profit-maximization and market share goals. Yet in a number of sectors today, strategy comes from players across a range of industries, in which they both collaborate and compete. For example, Sempels and Hoffman (2013) describe how in the "city services business" companies like Cisco, Siemens, IBM, Veolia, Bolloré, Peugeot and JCDecaux compete for a bigger share of city budgets.

Moreover, Selsky et al. (2007) argued that most mainstream strategic planning approaches conflate strategy with competition. The neoclassical approach thus relegates cooperative and collaborative initiatives to a tactical position, marginal to the main strategic activity. Here alliances and joint ventures tend to be undertaken in order for a focal firm to extract value from them for its own goals, at the expense of not only other alliance participants but also other players such as customers and suppliers.

Building on Emery and Trist (1965), Selsky et al. (2007) concluded that greater competitive intensity can damage the wider field of action through negative externalities not absorbed by the producers. They considered much of the strategic partnering seen across many industries to be "opportunistic", as the benefit accruing to each player tends to destabilize the wider field of action. This line of thinking was furthered by Dangerman and Schellnhuber (2013), who studied how the fossil fuel economy lock-in benefits individual firms and consumers over the short term, but hurts the field as a whole through climate change.

When the environment which companies inhabit changes, or is considered that it might soon change, companies engage in strategic renewal efforts to reinvent themselves, as Nokia has done several times (Aspara et al., 2013). When they become able at this, the routines they utilize

become dynamic capabilities that can be used repeatedly for their own strategic purposes (Ramírez, Gronquist and Osterman, 2013).

Selsky et al. (2007) argued that the neoclassical approach to strategic planning is challenged by environmental jolts (Meyer, 1982; Selsky and McCann, 2008), and by discontinuities and bifurcations (Prigogine, 1996; Bernard, 2008; Gladwell, 2000). This is because neoclassical approaches rely on competitive patterns (actions and reactions among players) observed in past behavior, and which are extrapolated into the future in terms of forecasts (Mintzberg, 1994). In addition, the neoclassical view assumes that the broader context for strategic action—the macro situation which envelops the "industry"—will remain stable in the sense that the fundamental structure of the environment will not change as a result of the players' intensified or sped-up competitive actions.

The socio-ecological approach to strategic planning is grounded in an open-systems view of an organization's strategic situation. As opposed to the firm as the focal unit of analysis in the neoclassical approach, it is the shared field of interorganizational action (Lewin, 1952) that is the core unit of analysis. It is within this broader perspective that the socio-ecological approach seeks to understand the position and behavior of actors (for our purposes, organizations) in that field. For instance, the business ecosystem model offered by Iansiti and Levien (2004), comprised of a central "keystone" firm and complementary firms in dynamic interaction over time, is a step in the direction of a field-based, socio-ecological approach to strategy; see also Normann and Ramírez's (1993) value constellation².

In the socio-ecological approach, collaborative interactions enjoy a higher profile as integral components of corporate and business strategic planning than in the neoclassical approach. Yet the emphasis is not within the industry, not on horizontal partnering with competitors, or even vertical ventures with value-chain partners. Instead, here collaboration is

² This was earlier explained by Callon (1986) and Akrich et al. (2002) in their sociology of translation, where they studied, for example, how EDF tried as a focal actor to create an "actor-network system" for electric cars with Renault.

with diverse actors and stakeholders of the broader fields in which organizations operate in order to together engage contextual level forces that affect or may affect all actors in a field. Examples include case studies of multi-stakeholder collaboration for regional economic development (Pava, 1980; Trist, 1986); business network development (Chisholm, 2001); complex cross-industry innovation (Dougherty and Dunne, 2012); and for cross-sector/multi-sectoral partnerships to address thorny social issues, such as climate change and economic inequality (see studies in Seitanidi and Crane, 2014).

In all such studies the field as a whole, rather than the single organization, becomes the locus for strategic planning. This opens up new possibilities. As Selsky et al. (2007, 75) proposed:

“In strategy making grounded in socio-ecological thinking, a generative dynamic of change arises from many sources in a field of action. Decision makers understand they can neither predict nor control this dynamic by each firm conducting its own conventional strategic decision making. Instead they engage in ... deliberation and dialogue ... in innovating new processes to guide their interactions and stabilize the extended field (Normann & Ramírez, 1993)... developing knowledge-based networks (Bettis & Hitt, 1995; Hanssen-Bauer & Snow, 1996)... new adaptive skills and capabilities at the firm and field levels (Lampel & Shamsie, 2003), such as learning and unlearning (Bettis & Hitt, 1995).”

The contrast we have introduced is important because it bears on the strategic relevance of predictable versus unpredictable uncertainty. In neo-classically based strategic planning, the single firm focus on commercial and competitive challenges, even when these lead to

hypercompetitive (d'Aveni and Gunther, 1994; Hanssen-Bauer and Snow, 1996) or game-changing possibilities (Christensen, 1997), implies a rather predictable kind of uncertainty. Decision theorists know that much of this can be assessed as risk. Responses tend to be “more of the same” leading to more intense competition as if nothing had changed or could change—which as Christensen showed, in most cases leads to the firm disappearing.

Socio-ecologically based strategic planning acknowledges commercial and competitive challenges, but is more sensitized to macro level disruptions and unpredictable uncertainty. It suggests that, when unpredictable uncertainty becomes the central concern of strategic planners, the strategic situation has shifted into a different, turbulent "texture", which calls for a different mode of strategic planning (Emery and Trist, 1965; Selsky et al., 2007). In the next section, we introduce the notion of causal textures of the environment to appreciate how unpredictable uncertainty invites strategic planners to broaden their view of the environment, and refocus scenario planning's role accordingly.

Causal Textures Theory: Theorizing Unpredictable Uncertainty

Origins and Main Contours. In the 1960s, researchers at London's Tavistock Institute sought to better understand increasing environmental complexity and uncertainty. This was the genesis of the social ecology school in organization studies.

Social ecology drew heavily on both systems theory and on contingency theory, which were still being developed. Contingency and population-ecology theorists offered conceptualizations of environmental uncertainty which focused on measurable dimensions such as the munificence, dynamism and complexity of task environments (Scott, 2002; Castrogiovanni, 2002). These became the accepted dimensions of the environment found in most organization theory textbooks. Social ecology took a different path.

Causal textures theory (CTT) is the part of the social ecology school that studies environmental types, and attends to how an organization and its environment relate. Consistent with its roots in open systems theory, in CTT parts of an organization and the organization itself are interdependent with parts of the organization's environment. For our purposes, the environment is comprised of different elements (forces, factors, actors, interactions).³

From the point of view of a focal actor whose context is being considered, the actors with whom it interacts are in its more immediate "transactional" environment. And this focal actor and its interactors in its transactional environment are themselves situated in a broader, "contextual environment". The contextual environment is made up of forces and factors—again, from the point of view of the focal actor—that actor cannot influence. The behavior of the forces and factors in the contextual environment, alone and jointly, shape and constrain the interactions and roles of actors in this focal actor's transactional environment (Smith, 1983). Several interacting organizations, their shared environments, and the links that join them constitute a "field".

Emery and Trist's distinctive contribution to organization studies was to render the environment as an explicit construct in and of itself amenable to research. With their contribution, the environment was neither "given", "out there", unknowable or random. They demonstrated that the environment has a distinct set of "lawful", regularized relations. CTT uses the symbol L to denote links within an organization, within the environment and between them. It uses the symbol 1 to denote the organization, and the symbol 2 to denote the environment. Thus, the two-way links between an organization and its environment involve transactional relations: *planning* (inside-out) L12 relations, and *learning* (outside-in) L21 relations. Links within an organization are L11, those within the environment are L22 (Emery and Trist, 1965; M. Emery, 1999). In CTT, an organization and its environment links coevolve over time (Emery and Trist, 1973; Trist, 1977; Selsky et al., 2007). Organizations influence their situation in

³More precisely, social ecology conceptualizes the environment fundamentally as the "extended social field of directive correlations" (Emery, 1977). It is a psycho-social space of interacting forces produced by the overlapping, intersecting networks of interactions of the purposeful actors inhabiting that space.

relation to the environment—and are influenced *by* the environment—through L12, L21 relations. As stated above, in the L22 space the contextual environment is beyond the influence of any particular organization in the field. The L22 links envelop the transactional L12 and L21 links for a given organization in a field. It is important to note that the L22 for any *particular* organization is constituted through the nature of L12 and L21 relations of *all* organizations in a shared field.

In CTT, the L22 distinguishes the transactional and contextual environments from each other (Emery and Trist, 1965; van der Heijden, 2005; Ramírez and van der Heijden, 2007). Neoclassically based strategic planning is concerned with how the more immediate transactional or business environment affects and is affected by the organization. An important implication of this for planning is that it tends to relegate the contextual environment to the status of unknown and unknowable unknowns or random, chance events. In contrast, the socio-ecological approach and CTT are concerned with how the contextual environment may affect and even transform the transactional environment. Scenario planning can play an important role here, as we show later in this paper.

An example helps to understand the regularized relations as seen in the CTT conceptual framework. Take a London food retail outlet such as a Tesco shop as the L11. Local families' food and shopping preferences, supplier delivery schedules, and parking in the local borough are in the retail shop's L21, L12 transactional environment. The L22 would involve links among planning rules, population density, urban mobility, family composition, migration, public health, culinary fashions and other forces and factors. Tesco's planners might consider that L22 links may transform what people buy and how, whether they can come by car or not, and when and how suppliers work. Tesco management would then consider if these are shop-specific issues, London-wide or company-wide, and adjust their formats (# shops/km², shop size, or % of sales online vs. in-shop) accordingly.

Emery and Trist proposed four causal textures of the environment, distinguished by the salience, complexity and uncertainty of L22 links for the organizations in the field. Table 1 shows that in each texture one set of links is most salient. Emery and Trist called the most complex and challenging environmental texture they were able to conceptualize the Type IV, or the "turbulent field", in which the L22 links are of greatest concern.⁴

- Table 1 about here –

As a field moves from one causal texture to the next (Terreberry, 1968), interactions in the field become more tightly coupled and thus more complex. The planning (L12) and learning (L21) links of organizations in the field that enabled survival in less-turbulent causal textures become less able to secure organizations' viability in turbulent conditions. That is, as environmental conditions become more challenging and volatile for those in it from texture to texture, the new causal texture threatens the adaptive capacities (Kerstholt, 1994) organizations in the field had developed to do well in the prior causal texture.

Interpreting the recent global financial crisis in CTT terms suggests this occurred time and again (see van der Heijden et al., 2008). That is, an American subprime mortgage meltdown became a national, then international, banking crisis. It then evolved into a global financial crisis in 2008. A variety of remarkable consequences have unfolded since then: A sovereign country debt crisis in EU member states in 2011; the Libor rate-fixing scandal in 2012; the current exchange and foreign exchange crises in emerging markets in 2013-14; and continued weakened economies and high unemployment. This unfolding set of crises can be read as the result of L22 links for any single actor (bank, pension fund, regulatory agency) because contextual forces and factors were becoming linked in unexpected ways, beyond the purview or control of any of those

⁴ McCann and Selsky (1984) and Baburoglu (1988) proposed hyper-turbulent and vortical environmental textures; these however are beyond the scope of this paper.

actors. For example, U.S. housing policy was linked with technical innovations in computerized trading and risk management; these were linked with regulatory agreements within and across countries and with risk-hedging mechanisms; and those were linked with the role of China in fueling economic growth and indebtedness in the West; etc.

Turbulence in CTT. In a turbulent texture, L22 links overwhelm the other three link types (L11, L21 and L12) for any one actor. They become the most salient set of links that strategic planners and managers seeking the survival and prosperity of their organization in the turbulent texture must attend to.

An organization's *experience* of turbulence is the crucial determinant of its actual manifestation or of how it might be expected. If the perception is that the links managed by the organization (L11/21/12) are or might soon become insufficiently resilient due to changing broader environmental forces to maintain its position or its viability—that is, to cope with L22—then turbulence is experienced. This means an environment perceived as turbulent by members of one organization may be perceived to be disturbed (Type III) or even placid (Type I or II) by members of other organizations in the same field (see McCann and Selsky, 1984). This interpretation differs from the original one offered by Emery and Trist (1965) who considered turbulence to be solely an objective property of a field, whereas here we consider it to be an individual assessment. As we discuss below, this assessment is mediated by perceived adaptive capacity (McCann and Selsky, 1984).

Thus, CTT construes turbulence as unpredictable uncertainty for strategic planning purposes. The distinctive contribution of the social ecology school is to examine unpredictable uncertainty as 1) a contextual-level phenomenon, produced in a field of tightly coupled interactions which can produce unexpected bifurcations (Prigogine, 1996; Bernard, 2008) and field-level unintended consequences; and 2) as a distinguishing property of a distinct "texture" of

the environment. It is because of these characteristics that CTT opens the possibility of identifying high-level strategic stances which organizations would find helpful to pursue in each texture, as is illustrated in Table 2.

- Table 2 about here -

Strategizing in a Turbulent Environment

The argument we have made so far suggests that choosing a strategic approach and planning techniques and methods to engage effectively in turbulent conditions may involve an alternative to conventional neoclassically based strategic planning processes, as the latter are arguably better suited to the "pre"-turbulent causal textures.

The direct implications for strategic planning in CTT have not been well developed. Selsky et al. (2007) began to redress this situation and we build on their work. They concluded that effective strategizing in a turbulent environment implied first and foremost seeking to decrease this turbulence, and required a shift in attention from any individual organization to the level of the field itself. This shift can best be accomplished via collaboration among functionally dissimilar kinds of organizations (Trist, 1983; Normann and Ramírez, 1993, 1994; Selsky and Parker, 2005). This, CTT holds, is intended to generate enough combined capacity to cope with the macro forces emanating from the L22, helping the field as a whole to become less turbulent while also making the strategic situation of each field member more tractable.

Collaboration does not replace the "normal" industry competition in firms' transactional environments that characterize the neoclassical approach. Instead, it complements competition with new, field-level kinds of strategic initiatives. Thus, responses to turbulence are often

complicated blends of competition and collaboration,⁵ which we explore below.

To build upon Selsky et al.'s (2007) analysis we drill down into the mechanics of CTT in two steps: First, we derive three principles inherent in CTT. They help to understand the experience of turbulence. Second, we identify high-level strategic stances corresponding to each of these three principles. In the section following this one, we articulate the implications of this analysis for scenario planning.

Three Underlying Principles in CTT

The description of turbulence above suggests three interrelated principles which characterize CTT that have been implicit and which we here spell out explicitly for the first time. See Table 3.

- Table 3 about here -

These principles carry insights that can help to rethink strategic planning in turbulent causal textures—and this can be enhanced with the help of scenarios. Moreover, as we show in the next subsection, clarifying these principles may help strategic planners to better appreciate the nature of the strategic situation they are facing, and thereby craft more effective strategies in turbulent environments.

The *transition principle* suggests that turbulence is not a stable state of a field, but a state that manifests itself in strong moments and which can then dissipate - or accelerate further. Our reasoning is that turbulence or anticipated turbulence tends to generate coping behavior; if it is successful it will increase adaptive capacity, and in so doing reduce or eliminate turbulence at least for some organizations. If coping is unsuccessful, the turbulent field will remain controlled by L22 for a long time, eventually killing off members of the field who failed to devise effective

⁵ A version of this suggested by Normann and Ramírez (1993) was that strategy would become interactive. Brandenburger & Nalebuff (1996) referred to their version of how this works as "co-opetition".

adaptive capabilities in time. For example, Nokia and Blackberry have struggled to survive as independent entities in the new web-intensive environment in which Skype and WhatsApp and Google's Android and Apple's iPhone/iTunes alternatives have thrived. The field of mobile telephony was shifted by technology and other macro factors from one in which strategies seeking proficiency in devices and security with consumers and utilities gave way to strategies seeking success in software systems, apps, as well as customer data mining with developers, advertisers, and venture capitalists as well as consumers. The latter firms have shown better strategic planning and change capacities (up to now) than Nokia and Blackberry, although three of them have now been bought – Microsoft bought Nokia and Skype, and Facebook bought WhatsApp – and one split: Nokia first split off and then merged its network operations with those of Siemens.

The *heterogeneity principle* suggests that turbulence is not necessarily homogenous across a whole field. Turbulence thus may be more salient in some parts of a field than in others (e.g. more for RIM and Nokia than for Apple). This makes a strategy of escaping the more turbulent parts and protecting or reinforcing the less-turbulent ones viable—see McCann and Selsky's (1984) "social triage". However, without qualification this principle could be taken to mean that all organizations could leave the turbulent parts of a field (perhaps through mass migration, or abandonment of a market or niche), in effect eradicating turbulence. This contradicts the CTT premise that transactional linkages among organizations (L11, L12, L21) cannot control turbulence in an L22-dominated causal texture.

Taking action to transform an organization from an individual "self" to an interorganizational collaborative "self" in the form of alliances or joint ventures amongst firms in different industries may be an effective strategy in such contexts (Ramírez and van der Heijden, 2007). This collaboration creates enclaves of relative stability within the field. Firms from different industries may create such collaborative enclaves by designing "value constellations"

(Normann and Ramírez, 1993, 1994) and setting new standards, such as the VISA system in payment cards (involving banks, retailers, telecommunications companies, etc.), or the TetraPak UHT milk packaging system (involving farmers, logistics companies, retailers, dairies, etc.) (Ramírez and Wallin, 2000). Those within the enclave, or value constellation, profit from the standards that are created, as these reduce the salience of L22 and help to sustain L12, L21 cooperation available only to those within the enclave. The L12, L21 standards (e.g., regarding what is legally possible to pay with VISA, and how healthy the "long-life" UHT milk will be) are internalized as a shared L11 by all members of the collaborative system, thereby strengthening its L12, L21, L11 linkage sets. In this way, the salience of L22 declines for those inside the collaborative enclave, while those outside the enclave continue to experience it as unpredictable and uncertain. Continuing with the telephony example above, the GSMA organization (www.gsma.com) includes most major players in mobile telephony and organizes the collaborations in technical and other relevant standards that allow them to manage uncertainties together to be able to compete and to collaborate with each other.

The *subjectivity principle* asserts that while turbulence may be an objective condition ("texture") of a field, in practice it is experienced differently by particular organizations in the field, depending on their "perceived adaptive capacity" (McCann and Selsky, 1984) to cope. This is a crucial factor, because in a turbulent field the strategic situation of an organization—constantly buffeted by potential or actual contextual disruptions, "black swan" events and other surprises—requires constant attention. The subjectivity principle implies that an organization can reduce turbulence by reimagining the L22 linkages creating the instability to find opportunities for action that it had not conceived before. For example, imagining different plausible futures for one's uncertain context with the help of scenario planning, and then considering options for action and interactions with others, opens possibilities to envision, and on that basis to develop, the capabilities needed to successfully engage with turbulence (Ramírez et al., 2010). For

example, one of us worked with a Scottish whisky company facing unpredictable uncertainties in terms of how supermarkets' changing business models (driven by Internet commerce, just-in-time logistics, changing demographics, enhanced data analytics, and other contextual factors) might transform how they related with independent distilleries. Scenarios helped the company's managers to imagine new possibilities to transform relations with these counterparts and enabled the company to thrive.

As stated above, "salience" is manifested from someone's perspective or experience. How that someone makes sense of the strategic situation is relative to their perceived adaptive capacity, and that capacity will determine if the salience of a contextual force is understood, misperceived or missed. Yet the subjectivity principle does not imply a sort of solipsism on the part of that someone working in an organization. Subjectivity is held in check by the coevolution between the actor and the context, by the interdependency with other perceivers in the organization and in the field, and by the objective basis of the turbulent causal texture.

While the three principles are distinct, they can work together. For example, turbulence may rise during a certain period (transition principle), perhaps partly as a result of field actors' weak collaborative actions (heterogeneity principle). And, these actors' perceived adaptive capacities for action might be partly dependent upon how they imagine and experience the field and their place in it (subjectivity principle).

Corresponding Strategic Stances for Turbulent Environments. The three principles implicit in CTT as articulated above indicate that turbulence is neither monolithic nor static, and suggest handles for engaging with it. The principles point to a set of corresponding strategic stances that an individual organization in a field currently in or threatened by a turbulent causal texture may undertake: a) *stocking up* resources to release or invest in time in order to survive and succeed over a turbulent period; b) *relocating* to a region of the field where the turbulence is felt less

acutely, and protecting or extending that region; and c) *reinventing* collaborative opportunity. These strategic stances aim to recreate more stable L21 and L12 conditions where strategic planners regain more control over their own activities.

Below we outline each strategic stance in turn. Then, in the next section we demonstrate the value of scenarios in each of the three.

Stocking up resources is the strategic stance that articulates the *transition* principle. It involves organizations building reserves of resources in times of no or low turbulence, enabling these organizations to invest those resources to strengthen themselves or to sit out or hide away when turbulence increases. This strategic stance depends on a good sense of anticipation, built-up resilience and alertness, and capacity to change quickly. Anticipation comes from deep appreciation of developments in the contextual environment (perhaps aided by scenario planning), including a good sense of what is predictable and what is fundamentally uncertain. In terms of the strategic stances summarized in Table 3, organizations using this strategy attempt to reinforce their own region of the field.

Stocking up with supplies before a harsh winter or storm is an apt image. A business example is the set of Basel III regulations and their proposed demand that banks hold more core capital to be able to sustain turbulent conditions without government bailouts and taxpayer subsidy. Seen as a counter-cyclical measure, this provision is consistent with the fluctuating nature of turbulence over time. Another example is a company amassing a "war chest" of cash, allowing it to buy other companies when the timing is right. A final example lies in military strategy: Armies are options for a scenario where war breaks out or can be used as a threat. A bigger and better-trained and equipped army lowers the likelihood of a war being declared by a country with a smaller and less-well-trained and equipped army.

Protection or defense of stocked-up resources from possible attacks is another aspect of this strategic stance. Examples from history are physical boundaries, such as military or

geopolitical fortifications (the Great Wall of China, Hadrian's Wall, the Berlin Wall, the Israel-Palestine and US-Mexico fences/walls), gated residential communities, and medieval monasteries. Business investments in IT firewalls to protect intellectual property serve a similar function. Border patrols, moats, defensive fortifications and software to prevent attacks secure bounded spaces intended to protect the certainty of the order "inside" from the disordered uncertainty perceived to lie on the other side of the boundary. In business contexts, trade barriers between countries, industry entry barriers and patent regimes are examples.

In CTT terms, the focus of attention for the *stocking up* strategic stance is the L11 linkages. This approach seeks to build up an organization's existing and future adaptive capacity rather than reducing its experienced unpredictable uncertainty. If successful, the organization may become more capable of competing or collaborating with others by deploying and defending its built-up stocks (capabilities, resources, novel processes, etc.).

The relocating strategic stance articulates the *heterogeneity* principle. It involves organizations migrating to locations in the field that are shielded from the worst impacts of turbulence. Historical examples include migrations away from oppression or resource-exhausted settings, such as the Irish migration to the New World during the 1840s famine, or the Jewish exodus from the European continent prior to World War II. A corporate example is "re-shoring"; that is, repatriating previously offshored factories to the better understood context of the home country (Gray et al., 2013).

The CTT focus in the *relocating* strategic stance is the L21 (learning) linkages, because this is how organizations probe the environment, learning about more and less turbulent regions in the field and taking action (see Table 2). This may mean reworking monitoring and attention priorities, scanning and early warning systems to better imagine when and how uncertainty might increase or decrease. For example, Ramírez et al. (2013) assessed how Statoil and Nokia

deployed scenario planning to redirect the attention of their competitive intelligence professionals.

The *reinventing collaboration* strategic stance articulates the *subjectivity* principle. It involves enriching organizations and their counterparts (Normann and Ramírez, 1993) with relevant knowledge about the possible unfolding of the turbulence they expect or are beginning to experience so they can negotiate and invent new roles and relationships. In this way they expect to reduce the turbulence they all face. Managers in a turbulent field may develop images of possible longer-term futures of their organizations and their environments (Emery, 1977). They may then deploy those images as an exploratory conceptual space, and consider longer-term options such as new policies in the service of possible resource configurations that can be designed and developed in the nearer term together with other parties. The formation of the G20 during the financial crisis is an excellent example of joint reinvention of policy, albeit more by similar than by dissimilar organizations. The same can be said for efforts to develop standards that serve organizations in different industries, such as the component standards established by a keystone firm in a business ecosystem across its global supply chain.

The CTT focus in the reinventing collaboration stance is the L12 (planning) linkages. This stance bears directly on the cognitive dimension of strategic planning (Kaplan, 2011). Consistent with the principle of requisite variety (Ashby, 1956), reinvention seeks to enlist field members to plan together to redress the imbalance between L11 and L22 and jointly create and sustain more collective adaptive capacity in the field.

Scenario Planning and CTT

CTT suggests that in a turbulent environment the contextual environment L22 must be given much more attention in strategic planning than the transactional (L21, L12) environment, which neoclassically based strategic planning is largely concerned with. In turn, attending to the L22

argues for a much more important role for futures methods like scenario planning (Normann, 2001). In this section, we explore some possible higher profile uses for scenario planning stimulated by the socio-ecological approach to strategy.

Across the differences evident among the various schools of scenarios (Bradfield et al., 2005; Ramírez and Selin, 2013), four themes that manifest the essence of scenario planning are discernible:

- Scenario planning aims to distinguish between what people understand as predictable and what they perceive as unpredictably uncertain, where the latter means not only not predicted but not predictable (Knight, 1921). Scenario planning is concerned with the unpredictable uncertainties emanating from links among broad macro-level factors, not with routine predictable uncertainties, such as seasonal demand or supply fluctuations.
- In scenario planning, that which is predictable is construed as an explicit model of the state of an organization and of its context. The model may be quantitative (e.g., a formal simulation) or qualitative (e.g., a narrative description, or a systems diagram). These models represent the relations both in the organization and in its context that are believed will continue unchanged into the future. Wack (1985a) called these “pre-determined elements”.
- In scenario planning, the factors which the strategic planners consider unpredictable uncertainty entail alternative plausible boundary conditions of possible, relevant, and challenging future changes for the model of the organization and its context.

- In scenario planning, the links among parts of the organization and its context are driven by those alternative, plausible boundary conditions. The way these links might evolve is manifested as temporal unfoldings in the form of a small number of model simulations, often depicted in systems diagrams. These plausible future boundary conditions are presented as alternative stories about different future contexts and how they might unfold. These stories not only express the effect of the alternative possible future boundary (or environmental) conditions, but also maintain internal consistency with the predetermined elements of the organization-context relations. At least two such descriptive system diagrams and stories are made, since much of the value scenario planning enables in strategic planning rests in comparing a small set of possible albeit incompatible futures. The generation of multiple stories of the future distinguishes scenario planning from other futures techniques that produce single endpoints or images, such as trends, forecasts, visions or reference projections.

Thus, scenarios help to surface and challenge existing assumptions about the environment of an organization and about how organization and environment might plausibly coevolve. They help decision-makers to understand not only the contexts in which they might find themselves in the future, but also those which they are operating in now, helping them to better prepare strategic options for action and to ascertain possible consequences (Normann, 2001). Scenarios use the future and its plausibilities to better understand the organization's context in the present. Scenarios do so by stimulating a more authentic dialogue to obtain a "higher quality strategic conversation" (van der Heijden, 2005; Wilkinson et al., 2013) about the unpredictable uncertainty in the field as it is manifested for any organization in such a field as its environment.

These four themes transcend the difference between the two approaches to strategy we have contrasted. Strategic planners may make use of scenario planning, but in different ways (for different purposes?). An exemplar of how neoclassically based strategic planners have made use of scenarios can be found in Michael Porter's *Competitive Advantage* (1995). There Porter dismisses "macroscenarios"—that is, future images of "macroeconomic and macropolitical factors"—as "too general to be sufficient for developing strategy in a particular industry" (Porter, 1995, 446-447), albeit useful for formulating strategy creatively in conditions of uncertainty. He suggests instead that "the appropriate unit for analysis of scenarios is the industry," and that industry scenarios "allow a firm to translate uncertainty into its strategic implications" for competitive strategy (Porter, 1995, 447).

From a socio-ecological perspective the unit of "industry" represents just one, indeed a narrow, set of possible links in the transactional environment. While clearly important for strategic planning purposes, in a turbulent environment the industry becomes too limiting as a main focus. For instance, it is not so relevant when devising strategies for activities that need to cross industry boundaries, such as for nutraceuticals, mobile payments, (Arvidsson, 2014) city services or other cross-industry domains. Thus, socio-ecologically based planners understand the "broad macro-level forces" (see first bullet above) as aspects of the shared field experienced by all organizations in it as their respective contextual environments. Porter's macroscenarios would correspond in socio-ecological terms to the salience given to the L22, and industry scenarios would be an aspect of the transactional (L12, L21) linkage sets. In socio-ecologically based strategic planning the attention is on how "macroscenarios" might plausibly *transform* the industry scenarios the neoclassical school focuses on. The attention is also on a broader view of

markets and other aspects of an organization's environment, which increasingly includes non-economic stakeholders⁶ and cannot be confined to a single "industry".

With a socio-ecological approach to strategic planning, scenario planning not only complements competitive strategy in turbulent conditions by framing strategic choices in multiple future plausible imagined contexts, but also can change strategies in some settings—see Wilkinson and Kupers (2013) for the case of Shell. Scenario planning from a socio-ecological perspective helps managers in organizations to engage turbulence in ways that scenario planning from a neoclassical perspective does not—and perhaps cannot. More specifically, as turbulence threatens to bring forth more unpredictable uncertainty than that which an organization or an industry has had to address and can cope with in non-turbulent conditions, its strategists may want to appreciate what it might be like to conduct business in different versions of the future. Scenario planning helps them to do so.

As scenarios examine the *context* within which strategic planning takes place, they cannot be confounded with strategy itself. Instead, they are deployed in the role of the test bed within which strategic options are considered. Scenario planning practitioners use the metaphor of a wind tunnel, where the strategy or intended business model is like a model airplane and the scenarios are the wind tunnel simulating the contextual flying conditions the actual plane may one day have to fly in. Because scenario planning helps to *frame* the strategic agenda by providing planners with a small set of distinct possible frames (Wilkinson and Ramírez, 2010), we believe Wright et al.'s (2013) suggestion that scenario analysis is a "discrete stage" in strategic planning is misguided. Scenario planning does not always precede strategic planning. Sometimes strategy is there first and needs checking via wind tunneling with the help of a set of scenarios. And, sometimes scenarios are conducted before a new strategy is determined.

⁶ In Porter's recent work he has broadened his sights to "sharing" value with other, non-economic stakeholders in the firms' context (see Porter and Kramer, 2011).

Nonetheless, scenario planning can take on a higher profile role in strategic planning in turbulent environments. For example, scenarios can help strategic planners to reconsider their transactional linkage configurations by "upframing" their strategic analysis. According to Normann (2001), upframing involves moving the strategic analysis to a higher level of conceptualization. Upframing puts the mind of the strategist in a future conceptual context. This resituating frees the mind (Ramírez et al., 2013) from the constraints inherited from the past, when it considers options in broader contextual terms in the present. We offer illustrations of a higher profile role for scenario planning in strategic planning below.

How Scenarios Contribute to Strategic Planning in Turbulent Environments

Strategic planners may make use of scenarios in turbulent environments in several different ways. These include:

(a) recognizing that the causal texture of a field might become turbulent before it actually does so, and imagining the possibilities and challenges this might pose for one's strategy (http://newsroom.cisco.com/dlls/2010/ekits/Evolving_Internet_GBN_Cisco_2010_Aug_rev2.pdf).

(b) assessing whether the context is beginning to become or has already become turbulent if (a) has not been possible, and imagining different possibilities and challenges this might pose for one's strategy (Arvidsson, 2014).

(c) given (a) and/or (b), helping to prepare for turbulence by identifying experiments, prototypes, research, and actions to arrest the development of turbulence by engaging in active-adaptive behaviour and avoiding maladaptive behaviour (Ramírez et al., 2011).

(d) giving guidance and hope to those already in a turbulent environment by proposing collaborative strategic options and/or designing in authentic collaborative activities that stabilize and/or develop the field (Emery and Trist, 1965; Trist, 1979).

Based on the connections we have drawn between turbulence and scenarios, we now tease out aspects of scenario planning informed by the three strategic stances discussed in the previous section (see Table 3).

Scenario planning can help strategic planners with their *stocking up strategies* to imagine how a field in a Type III causal texture might become turbulent, and the possible ways in which turbulence might play out if and when the texture of the field advances to Type IV (see Table 1).

An example is the classic scenarios produced by Shell in the early 1970s about the possible creation of OPEC (Wack, 1985). This reportedly led the company to build up a portfolio of assets suited for this possibility which the competition did not, giving them substantial competitive advantage for many years.

Scenario planning with *stocking up strategies* considers how what existed in a non-turbulent context might help survival in a turbulent one, and how to plan to best enhance the organization's prospects. Thus an army may be "underused" during peaceful periods of non-turbulence and "stretched" in periods of turbulence, even if no war actually breaks out. A military policy scenario exercise as part of a larger geopolitical or counterterrorism policy review may thus generate the awareness that more "spare capacity" should be built *ex ante*, such as by training and arming reservists that can be called upon if needed.

With *relocation strategies* scenario planning can enable those in a field to explore together what a shared future might hold, then imagine which parts of the field they can access might have less turbulence, and how they might move, create or strengthen enclaves.

An example the first author was involved in was efforts by London First, an association of London-based businesses, to prevent businesses already located in London from relocating elsewhere and to encourage further business migration into London. In a similar way, van der Heijden (personal communication) advised the Limburg region of Holland, where economic activity and creative professionals have been leaving, on how that tide of brain drain and economic decline can be stemmed, and to help the community to explore what futures they might need to plan for.

Scenario planning here involves imagining which alternative contexts might better house the existing business logic of the strategizing organization and as part of strategic planning preparing contingency plans for repositioning assets to those contexts should the need arise. Shipping companies such as Maersk do this well. Similarly, as discussed above, some local economic development initiatives attempt to forge common ground among business and labor interests to attract investment and jobs back into the community.

With *reinvent-collaboration strategies* scenario planning helps strategic planners to reframe unpredictable uncertainty not only as threatening but also as a source of opportunities (Ramírez and van der Heijden, 2007; Sull, 2009). Joint scenario planning invites those in the field to consider what competencies and skills they can jointly muster to enhance their adaptive capacities.

As scenario work facilitates higher quality, more authentic strategic conversations about possible future contexts, scenarios help those in the conversations to explore and appreciate each other's perspectives (van der Heijden, 2005). This in turn can help them to broaden their strategic thinking, learn about possibilities they were unaware of, and explore ways of putting them into practice through joint experiments, ventures and projects.

Van der Heijden's project on the future of Indian agriculture (2008, 2010) is a good example of this use of scenarios. An initial set of scenarios developed in that project helped the

World Bank, Indian agricultural researchers, and stakeholders to examine what options would and would not be possible to consider for the Indian agricultural sector going forward. Once the first set of conversations ran their course, the first set of scenarios was laid aside, and a second generation of scenarios was constructed to further clarify the options and improve the quality of the subsequent strategic conversations.

Another example is the World Economic Forum's 2009 project to explore the future of pensions (Sikken et al., 2008), which first developed a set of scenarios that considered a set of different plausible conditions pensioners and pension fund managers might live in. The project then developed strategic options for joint action, which enabled disparate actors (e.g., private firms, nation states, and interest groups) to jointly assess how they might tackle their pensions challenges in an ageing society. A second round of work following the scenarios was undertaken to identify opportunities for common action (Hayashi et al., 2009), which produced a report that kept the conversation going, and spawned various joint initiatives among players from different industries.

Concluding Remarks

In this paper we have argued that strategic planning today is still largely dominated by mental models based in neoclassical economics, characterized by the individual organization as the unit of analysis and action, intra-industry competition, and fields in relatively stable equilibrium. However, the relentless advance and spread of turbulence in the contextual environments of many organizations—signified most forcefully by the 11th of September 2001 attacks and the events these spawned, and more recently the Great Financial Crisis—have called those models into question. Contextual turbulence can no longer be safely ignored nor considered to be an aberration on an otherwise relatively stable field. Therefore, new strategic planning modes are needed.

To this end, we contrasted what we called the "conventional neoclassically based approach" to strategic planning with a "socio-ecological" approach by centering attention on how each handles contextual unpredictable uncertainty. We proposed that the socio-ecological approach, and specifically the causal textures theory of organizational environments, is better suited to appreciating and engaging the unpredictable uncertainty that characterizes turbulent environments than neoclassically based strategy. Our analysis leads us to conclude that in turbulent environments strategic planners would be well advised to extend their repertoire of tools to also include methods that help engage unpredictable contextual uncertainty like scenario planning. Thus, we argued that causal textures theory helps strategic planners to better understand the broader, higher order purpose of scenario planning, and guides them on how to make use of scenario planning to effect better strategies in a turbulent environment.

This paper makes two main contributions. First, it advances understanding of turbulent causal textures in ways that strategic planners and strategic planning researchers can harness. We began by contrasting two senses of uncertainty, and arguing that conventional strategic planning attends largely to the "predictable" kind, which can be calculated with probability and managed or hedged as risk. However, we also argued that *not* attending to the other kind, "unpredictable" uncertainty, is itself "risky"—or, rather, "dangerous"—in today's volatile and highly disruptive conditions. Because the strategic situation is so uncertain, multiple alternative images of possible futures are needed in strategic planning under such conditions (Ramírez and Selin, 2014). Our analysis suggested that a central purpose of scenario work is to support strategic planners facing turbulent causal textures or wanting to prepare themselves (and others in their transactional environment) for such eventualities.

It is thus that CTT shows that scenario methods are particularly suited to engaging the contextual environment (L22) when unpredictable uncertainty becomes especially salient for strategic planning. This makes it distinct from scenario planning in the neoclassical mode, which

dismisses the contextual environment and confounds the transactional environment with only one narrow – and typically historical- possibility; namely, the industry.

In situations where the contextual uncertainty described by complex and tightly coupled L22 relationships is not salient for strategy, then methods derived from and consistent with neoclassical economics which address the transactional L12, L21 linkages directly—such as competitive positioning, forecasting, or "war-gaming"—are likely to be more useful. In this regard, strategic planners might use the features in Table 1 as a heuristic guide or checklist in assessing their contextual environment. Thus, we provide a conceptually robust basis for why and how scenario planning can help strategic planners to address the neglected aspect of uncertainty advantageously in their strategic planning.

Second, our analysis extends causal textures theory and gives it a broader set of actionable handles in the field of strategic planning. CTT's seminal contribution to understanding organizational environments was to identify the distinctive features of turbulence in the contextual environments shared by all organizations in a particular field, and to explore responses to it. In the most common usage, "turbulence" is simply a lot of change, or sudden and unexpected change that challenges the decision and strategic planning capabilities of managers. However, CTT specifies that the passage into turbulence is a distinctive casual texture that involves a felt loss (or feared future loss) of adaptive capacity by those in it. Ramirez and van der Heijden (2007) extended this further to include not only loss of adaptive capacity but the potential loss of not developing new options to do well in the future – our approach here, consistent with theirs, makes the CTT strategic stance less 'passive-reactive' and more interactive-creative.

We posited that, rather than being monolithic, turbulence has three kinds of variability: temporal, spatial and cognitive. We articulated these in terms of three principles: transition, heterogeneity and subjectivity. It is this specification of turbulence that allowed us to suggest

how scenario planning deployed in the socio-ecological mode can help strategic planners in turbulent environments to address the challenges turbulence poses – and to do well in such conditions. These principles help to clarify options available to strategic planners to better engage the unpredictable uncertainty of turbulence. They provide planners with a conceptual framework to assess when to deploy scenarios that attend to macro- or contextual environment changes for strategic planning purposes, as summarized in Tables 2 and 3. For researchers, this analysis invites further conceptual developments of CTT in relation to contextual disruptions, transitions, system dynamics models of large-scale fields, the resilience of such fields, foresight processes and coevolution.

We hope our analysis will usefully inform reflective strategic planning practitioners engaged in scenario work, and deliver new insights for scholars seeking to understand better how exogenous unpredictable uncertainty informs choices about when scenarios might be used as an effective strategic intervention method.

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