Evidence-Based Organizational Learning

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Abstract

The growing importance of data-driven decision-making to organizational competitiveness poses a number of vexing organizational learning related questions. In order for organizations to develop methodologically-sound and informationally-complete organizational learning capabilities that go beyond mere accumulation, storage and cataloging of data and other informational assets, more explicit information amalgamation and synthesis focused frameworks are needed. The Empirical & Experiential Evidence (3E) framework outlined here is built around the idea that since the primary utility of organizational knowledge is to support organizational decision-making, topically-related data and information can be considered decision-guiding evidence. The framework's evidence synthesis logic parallels the general 6-step process of identifying, assessing, aggregating, weighing, agglomerating and incorporating distinct but related information, but that process is nested within a 3-tier evidence classificatory schema which categorizes all available decision inputs into two broad meta-categories, four more narrowly scoped categories, and twelve even more operationally meaningful sub-categories. The 3E framework also puts forth specific evidentiary insight extraction methodologies that reflect the informational uniqueness of the two meta-categories and four categories.

Keywords

organizational learning; management decision-making; empirical and experiential knowledge; knowledge creation; knowledge integration; learning frameworks; bias reduction; fact-based decision-making

Organizational Decision-Making

One of the core characteristics shared by business and other organizations is the need for ongoing decision-making (Casey, 2005; Fiol and Lyles, 1985; Wang and Ellinger, 2011). Broadly defined as commitment to a course of action intended to serve a particular end goal (Dodgson, 1993; Easterby-Smith, Snell, and Gherardi, 1998), organizational choices can be seen as products of boundedly rational processes, so characterized because of being commonly constrained by limited/incomplete information, cognitive mental limitations and biases, and time limitations (Antonocopoulou and Chiva, 2007; Bell, 2016; Gnyawali and Stewart, 2003: Kahneman, 2011; Ortenblad, 2002; Rasmussen and Nielsen, 2011; Simon, 1991). After decades of cognitive and behavioral research, the mental heuristics and proximal mechanisms that produce judgments and choices are still poorly understood (Hoffmann, Gaissmaier and von Helversen, 2017; Seta et al., 2015)), which in a way is not surprising given the paradoxical complexity of human cognition – how does one make sense of one's sense-making? Adding to the complexity of deciphering the mechanics of sense-making is an obvious observation that many, perhaps even most decisions are shaped not only by cognitive, but also by psychological and emotional (Lucas and Kline, 2008; Schein, 1993; Wastell, 1999; Yanow, 2000), and even biological (Salvador and Sadri, 2018) characteristics. As famously noted by Rene Descartes[1], conscious choice-making can be considered the ultimate manifestation of one existence, thus it can also be considered the ultimate manifestation of one's individuality (Ferrin, 2017).

When decisions are made within an organizational setting, additional, group level factors also need to be considered. Those include decision influences that can be characterized as enduring, best exemplified by organizational culture (Yates and de Oliveira, 2016; Briley et al., 2014; Markus and Kitayama, 1991) and structure (Schreyogg and Sydow, 2010; Hinings et al. 1996; Gurpinar, 2016), as well as those that are more situational in nature, as exemplified by decision type (De Smet, Lackey and Weiss, 2017; Puschke, 2009) and group dynamics (George and Dane, 2016; Edmondson, 2002; Lucas and Kline, 2008; Schein, 1993). Together with decision-makers' cognitive, psychological and emotional traits, group-level characteristics shape attitudinal and behavioral determinants of collective organizational functioning (Levy, 2017; Sessa and London, 2007), which in turn frames the context of organizational choice-making processes (Hofstede and Hofstede, 2005; Kogut and Zander, 1996). Hence making sense of organizational sense-making calls for an explicit differentiation between single- and multi-actor choice-making considerations, especially the interplay between personal and interpersonal factors that shape organizational decision outcomes (Coleman, 1990; Gioia, 1998; Ouchi, 1979).

Moreover, considering that decision scenarios ultimately call for either a simple, typically binary (i.e., yes vs. no), or a more complex choices (Banasiewicz, 2019 forthcoming; Kocabiyikoglu and Hekimoglu, 2018; Nutt, 1984), understanding of that aspect of decision complexity is also essential to unmasking the mechanics of organizational decision-making. That is because from the standpoint of rational choice making, binary outcome decisions can be seen as being shaped, primarily, by the preponderance of 'for' vs. 'against' evidence, while open-ended decisions entail far more nuanced sets of considerations (Ranyard et al., 1997; Singer and Engel, 2008; Piccirillo and Noro, 2008; Said, 2006). Hence the latter scenario calls for more decision-guiding evidence, and more involved evidence evaluation, which in turn highlights the importance of effective information processing mechanisms (Banasiewicz, 2019, forthcoming). That is not to say that organizational decision-making should be reduced to a set of computational algorithms, but the process could clearly benefit from more explicit decision-aiding framework given the typically large volumes and rich varieties of available and decision-pertinent information, coupled with potentially biasing influence of group level factors such as culture (Briley et al., 2014; Hofstede and Hofstede, 2005; Schein, 1993) or motivation (Kahneman, 2011; Sessa and London, 2008), and cross-individual cognitive variability (Nakauchi, 2017; Caputo, 2016; Hilbert, 2012;

[1] Cogito, ergo sum (Latin for 'I think, therefore I am').

Sessa, 2008). In a sense, the value of an explicit organizational decisioning support framework becomes most apparent when considering the potentially skewing influence of implicit social cognition (Uhlmann et al., 2008; Akgun et al., 2003; Gnyawali and Stewart, 2003; Schneider, 1991). Broadly defined as mental processes that occur outside of conscious awareness or control in relation to socio-psychological phenomena (Smeding et al., 2016; Karpinski and Steinman, 2006), those instinct-like sense-making mechanisms that bridge the gap between group and individual level attributes are believed to be responsible for many of an individual decision-maker's attitude-based responses, including the use of stereotypes (Delavande and Zafar, 2015; Gardiner et al., 2013). Within the confines of organizational decision-making, implicit social cognition can bring about noticeably different interpretation of the same sets of facts, some of which can be in the form of informative insights, and some can be a manifestation of perception-warping bias (Gawronski and Bodenhausen, 2005).

Decision-Making and Group Dynamics

Conventional wisdom suggests that groups make better decisions than individuals, because of greater capacity to accumulate and deal with more information, encourage divergent and innovative thinking, point out group members' errors, and reduce the impact of cognitive bias (Nakauchi, 2017; Caputo, 2016; Hilbert, 2012; Kahneman, 2011; Sessa, 2008; Drach-Zahavy and Somech, 2001). However, research in areas of social cognition and social psychology paints a somewhat different picture, one which suggests that cognitive, social and situational influences determine the quality of decision-making, and that groups do not always outperform individuals (Abatecola et al., 2018; Cristofaro, 2017; Mazutis and Eckardt, 2017; Bhatt, 2000). While interactions taking place within groups indeed increase decision confidence, that does not necessarily translate into higher decision quality because of two main reasons: First of those is the phenomenon often referred to as 'groupthink', a dysfunctional pattern of thought and interaction during group decision-making characterized by closed-mindedness, uniformity expectations, and group bias (Russell et al., 2015; Benabou, 2013; Schafer and Crichlow, 1996). The second is biased information search, characterized by strong preference for information that supports the group's view (Kopsacheilis, 2018; Rozas, 2012; Fischer et al., 2011; Schultz-Hardt et al. 2000). Thus thinking of organizations as communities specializing in knowledge creation and transfer, it is essential to recognize that while groups have the potential to enhance the capacity, objectivity and creativity of organizational thinking, the realization of that promise is contingent on containing cognitive diversity-suppressing aspects of group dynamics (Atewologun, 2016; Lucas and Kline, 2008; Shiller, 2005; Driver, 2003).

An aspect of cognitive diversity that is of particular importance is critical thinking, a summary construct capturing an individual's ability to evaluate and analyse an issue of interest in a rigorous manner (Sessa and London, 2008; Natale and Ricci, 2006). More specifically, a critical thinker examines the underlying assumptions, is able to discern hidden values, has the capacity (in the sense of cognitive abilities and reasoning/analytic tools) to evaluate evidence, and assess the efficacy of conclusions. While framed using common attributes, critical thinking is inescapably individual because it calls upon both explicit and tacit knowledge to produce a unique perspective, ultimately giving rise to cognitive diversity at a group level. In that sense, individual-level critical thinking is a core determinant of the efficacy of group-level decision-making – the rather commonly encountered phenomena of groupthink and biased information search suppress the degree of cognitive diversity of a group by stemming the individual group members' critical thinking.

A yet another important, organizational decision-making related aspect of group dynamics is group conflict (Katz et al., 2016; Stanley, 1981). As suggested by social exchange theory, which views the stability of group interactions through a theoretical lens of negotiated exchange between parties, individual group members are ultimately driven by the desire to maximize their benefits, thus conflict tends to arise when group dynamics take on more competitive than collaborative character (Li-Fen, 2008; Gould-Williams, 2005). Keeping in mind that the realization of group decision-making potential requires

full contributory participation on the part of individual group members, within-group competition reduces the willingness of individuals to contribute their best to the group effort.

An important aspect of competition vs. cooperation themed group dynamic is the extent of information sharing (Kembro and Selviaridis, 2015; Van Swol, 2007; Christensen, 1996). Research focused on group decision-making related information pooling points toward a consistent tendency to pool and repeat more of shared than unshared information, a phenomenon now known as information-sampling bias (Hunton, 2001). Considering that in-group competition activates individuals' fears of being exploited (while also heightening the desire to exploit others) and makes individuals more focused on standing out in comparison of competencies with others, group information processing is also characterized by the tendency to evaluate one's own information more favourably than information of others', a tendency known as ownership bias (Arai et al., 2016; Van Swol, 2007), and the inclination to evaluate more positively any information that is consistent with one's initial preferences, a psychological phenomenon known as preference effect (Faulmuller et al., 2010; Mojzisch and Schulz-Hardt, 2010). Moreover, as posited by the Motivated Information Processing in Groups model, information processing in groups is driven by two orthogonal motivational factors of epistemic and social motivations (Super et al., 2016; Nijstad and De Dreu, 2012; Bechtoldt et al., 2010). Individual-framed epistemic motivation captures individuals' willingness to expend effort to achieve thorough and accurate understanding of the problem at hand, while group-described social motivations capture individuals' preferences for sharing in outcome distributions.

Organizational Learning

Although as evidenced by Argyris and Schon's 1978 book, *Organizational Learning: A Theory of Action Perspective*, and even earlier studies (e.g., Arrow, 1962; Cangelosi and Dill, 1965; Cyert and March, 1963; Lawrence and Lorsch, 1967), learning has been recognized as a distinct organizational competency for nearly half a century, it was not until the 1990 that the topics of organizational learning and learning organizations spurred wider interest among researchers (Rebelo and Gomes, 2008; Bapuji and Crossan, 2004; Dodgson, 1993), resulting in rich and varied research streams (e.g., Cohen and Sproull, 1996; Denton, 1998; Marquardt, 1996; Popper and Lipshitz, 1998). The 1990 Senge's book, *The Fifth Discipline: The Art and Practice of the Learning Organization,* did much to popularize the notion of the learning organization, compelling managers to expressly pursue the acquisition of unique organizational know-how as a distinct source of competitive advantage, so much so that it eventually gave rise to concerns that organizational learning was just another passing fad (Robelo and Gomes, 2008). And while approaching organizational learning as a yet another buzzwords and acronyms filled universal quick fix, one-size-fits-all, templated solution to organizational problems indeed warrants skepticism, it is nonetheless inconceivable that an organization could succeed in today's knowledge economy without developing robust, systemic learning mechanisms.

The notion of learning is typically associated with the acquisition of knowledge by individuals – what then is organizational learning? Formally defined as the process of acquiring, creating, integrating and distributing of information (Wang and Ellinger, 2011; Dixon, 1992; Huber, 1991), organizational learning can ultimately be seen as a process of preserving certain behaviors, norms and values, shaped by organization-specific structural and cultural forces (Belle, 2016; Yates and de Oliveira, 2016; Rasmussen and Nielsen, 2011; Bhatt, 2000), and encompassing the two independent dimensions of behavior, or the act of doing (Templeton et al., 2009; Hult and Nichols, 1996), and cognition, or the process of knowing (Chiva and Alegre, 2005; Akgun et al., 2003). The former commonly takes the form of what is known as lower level learning, which is the process of forming rudimentary behavior-outcome associations, while the latter usually takes the form of higher level learning, which is the process of discerning overall rules and norms; both are shaped by external factors such as culture, strategy, structure, and the environment

(Yates and de Oliveira, 2016; Wang and Ellinger, 2011; Rasmussen and Nielsen, 2011; Rebelo and Gomes, 2008; Sessa and London, 2008).

The term 'learning organization' captures actual or aspirational capability to adapt to opportunities and threats by means of identifying and assimilating appropriate knowledge and implementing necessary changes (Gronhaug and Stone, 2012; Rebelo and Gomes, 2008; Yeo, 2005), though it is sometimes seen as yet another quick fix managerial remedy popularized by consultants dispensing sage advice and surefire solutions promising to deliver a lot and fast (Buckley et al., 2015; Rebelo and Gomes, 2008). Still, learning is endemic to organizational functioning, and thus developing sounder underlying of the underlying mechanics of organizational learning is important. Taking a step toward unmasking outcome-oriented aspects of organizational learning, a number of learning type schemas have been proposed, as exemplified by Gnyawali and Stewart's (2003) reinventive, formative, adjustive and operative learning, or Sessa, London, Pingor, Gullu and Patel's adaptive, generative and transformative learning (Sessa et al., 2011). However, comparatively little research effort has been directed toward developing deeper understanding of the input-oriented aspects of organizational learning, thus it is the goal of the ensuing analysis to contribute to that dimension.

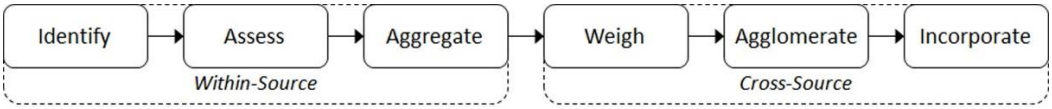
Evidence Focused Organizational Learning

At the first glance the notion of 'knowledge' is deceptively simple, but the veneer of clarity quickly disappears upon closer examination of the concept's multidimensional epistemological foundation (Blumberg, 2009). Originally framed by Plato, some 2,500 years ago, as 'justified true belief' (Dutant, 2015; Banasiewicz, 2013), this broad conception of knowledge is still widely used today. It suggests that a person knows something if and only if that something is true, and the person is completely justified in believing that, which in turn requires that belief to not be predicated upon any false causes. Stated differently, 'knowledge' as a property or a state is inseparable from the process of 'knowing'. It thus follows that when that abstract notion of knowledge is considered in the context of 'what' or the state, and 'how' or the process, the result is the first step toward a more operationally meaningful categorization of knowledge, as exemplified by deductive and inductive (Cellucci, 2015; Evans, 2002), tacit and explicit (Addis, 2016; Huang et al., 2014; Hau et al., 2013) or declarative and procedural (Herz and Schultz, 1999; Willingham et al., 1989) types of knowledge; further topical contextualization will result in progressively more specific and operationally meaningful domains of knowledge.

The recently proposed Empirical & Experiential Evidence (3E) framework (Banasiewicz, 2019 forthcoming) promotes that goal by outlining the means of amalgamating and synthesizing source- and type-dissimilar information into a singularly conclusive, decision-guiding evidence. In a manner conceptually similar to other evidence-based practice conceptualizations (e.g., Barends et al., 2014; Rousseau and Barends, 2011), the 3E framework is built around a general progression of systematically identifying, assessing, aggregating, weighting, agglomerating and incorporating decision-related information. However, unlike those conceptualizations, which are built around essentially a single source of information, typically in the form of scientific/academic research, the Empirical & Experiential Evidence framework takes a considerably more expansive view of informational inputs. In fact, the framework's operationalization, discussion of which falls outside the scope of this paper, favors exploration and synthesis of organizational data, which due to its broad scope (transactional and operational details, consumer characteristics and activities, etc.), recency and granularity are now widely considered to contain the greatest potential informational value to organizational choice-making (Cordon e al., 2016; Manyika et al., 2011). At the same time, however, the 3E framework looks beyond the 'it is all about data' mindset (Kambhampaty, 2018; Smith, 2018) because data tend to be incomplete and noisy (Tang and Ishwaran, 2017), and data analytic methods can only yield probabilistic insights (Skilling, 1998). But when organizational data-derived insights are thoughtfully combined with other sources of information, the result is a material improvement in the validity and reliability of organizational

knowledge. Doing so, however, requires the earlier mentioned identify-assess-aggregate-weigh-agglomerate-incorporate process to account for within-source and cross-source aspects of information pooling, as depicted in Figure 1.

Figure 1
The Evidence Progression



The within-source vs. cross-source distinction is intended to highlight the two phased essence of the 3E framework, which draws attention to, first, judicious discovery and pulling together of all similar, or type-specific data, and, second, thoughtful syndication of distinct types of informational inputs. One of the obvious obstacles to doing so is informational over-abundance. From diverse and voluminous torrents of operational and related data, to research outlets numbering in thousands, to the diversity and subjectivity of expert options and industry benchmarks, the variety and the volume of potentially decision-pertinent information are overwhelming. Making meaningful use of what is 'out there' is contingent on developing a broad classificatory schema to organize the myriad of informational inputs into mutually exclusive and, as much as possible, collectively exhaustive categories.

Knowledge as Evidence

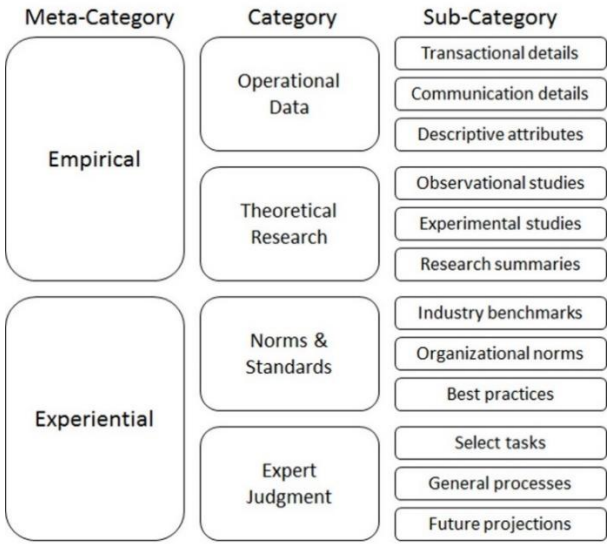
A starting point in developing a categorization schema that is both generalizable as well as sufficiently detailed when applied to individual organizations is to frame the informational context in terms of decision-aiding evidence. Defined as facts or other organized information presented to support or justify beliefs or inferences (Kvernbekk, 2011; Luther and Sartawi, 2011; Simmons, 2003; Herbert et al., 2001; Melnick et al., 1997), it is widely used widely in modern science to lend substantiation to theoretical postulates (Bui-Klimke and Wu, 2014; Chiesa, 2010; Gott and Duggan, 2003; Goodman and Royall, 1988), in medical diagnosis and treatment (Osara et al., 2015; Hansen and Kappel, 2010; Candelise, 2007; Simon, 2006), in the practice of law to help settle disputes (Federal Judicial Center, 2011) and to pursue social justice agenda (Hulle et al., 2018; Russell, 2016), and more recently, in organizational management (Yoon at al., 2017; Hasson et al., 2016; Wang and Ohsawa, 2013; Luther, 2011; Snowden and Boone, 2007). Since 'facts and other organized information' constitute a very broad, open-ended pool of possible indications, available and pertinent evidence may encompass a mixed bag of signs, some supporting and others refuting a particular belief or proposition. Consequently, the totality of evidence is usually considered from the perspective of the degree to which the majority of indications support or not a particular argument. Within the confines of scientific and diagnostic settings evidence is commonly framed using the notion of weight of evidence (Weed, 2005), while within the legal setting the evidentiary plurality is captured in the notion of preponderance of evidence (Stempel, 2000).

Implied in the conception of evidence outlined here is the notion's external-to-self aspect – in order to offer defensible corroboration of one's internally held beliefs or conclusions, facts or information used to substantiate those beliefs ought to be derived from sources that are external to the belief system. Presenting one belief as a "proof" of another belief is intellectually speaking tautological, and practically speaking unconvincing. This is not a novel idea: scientific theories are validated using independent observations, medical diagnosis rely on tests, and legal disputes are resolved by independent facts. In a more general sense, objective, empirical evidence is more credible and more persuasive than perception-colored and possibly atypical subjective beliefs (Boldt et al., 2017; Spence et al., 2016; Yeung and Summerfield, 2014).

What about professional expertise? Experience has long been recognized as an important contributor to professional, and thus organizational learning (Lindeman, 1926; Dewey, 1938); moreover, being derived from direct observation of or participation in specific events or activities (Clemes et al., 2011; Gammie, and Joyce, 2009) clearly suggests a distinct external-to-self element. However, being inescapably individual-specific, professional expertise is markedly different from empirical evidence. While data or research derived evidence tends to be more persuasive in a group setting, experience can play a disproportionately influential role in shaping beliefs of individuals (Lahlou et al., 2015; Engellandt and Riphahn, 2011; Koizumi, 2016). A professional's experience tends to weigh heavily on his or her judgement precisely because it is personal, in the sense that any resultant beliefs feel intuitively correct, especially when accompanies by high levels of belief confidence (Hodgkinson, 2009; Sjoberg, 1982). In fact, experience rooted beliefs can overshadow more objective evidence, primarily because experiential knowledge is closely linked to one's self-esteem (Curtis and Lee, 2013; Armstrong et al., 2012; Bruine de Bruin, 2007; Kolb, 1984). It thus follows that strong preference for self-referential knowledge can adversely impact organizational group dynamics (Gilovich et al., 2002; Heider, 1958), potentially weakening organizational learning. Such dangers notwithstanding, when carefully harnessed, experience-based knowledge can positively contribute to the totality of organizational knowledge base (Hahn, 2014; Lehmann and Heagy, 2008).

The preceding discussion suggests that decision-guiding evidence can be grouped into two broad meta-categories of *empirical* and *experiential* evidence. The former encompasses external-to-self knowledge, gathered by means of recording of events and states, while the latter embodies cumulative, experience-based learnings of individuals. Empirical evidence can be further subdivided into *operational data*, which encompasses details of electronic transaction processing, communication exchanges and characteristics of entities, states or events, and *theoretical research*, which encompass observation or experimentation based scientific inquiries. Experiential evidence can also be subdivided into two distinct components of *expert judgment*, which are opinions and forecasts of highly qualified and practiced individuals, and *norms and standards*, which encompasses recognized best practices and industry benchmarks. Offering a still greater degree of operational clarity, each of the four broad evidence categories – operational data, theoretical research, expert judgment, and norms & standards – can be further subdivided into more informationally homogenous sub-categories, as summarized in Figure 2.

Figure 2
General Evidence Typology



Within the *empirical* meta-category, the *operational data* category is comprised of three distinct sub-categories of *transactional details, communications,* and *descriptive attributes*, which are all still relatively broad types of data that are either directly or indirectly captured by business organizations. Overall, the defining characteristic of operational data as a source of organizational decision-making inputs is that it encompasses a typically enormous varieties and volumes of raw data, which require a combination of vision, data analytical skill and organizational commitment before it can offer decision-guiding value.

The second of the two categories nested within the empirical meta-category, *theoretical research,* contributes very different types of informational inputs – in contrast to 'raw materials' supplied by operational data sources, theoretical research offers 'ready-to-use' insights. It is important to note that while the domain of theoretical research is very broad, only those efforts that make use of explicit hypotheses tests or other confirmatory or exploratory analyses of *observationa*l or *experimental* data are considered here, because those types of studies demonstrate the requisite external-to-self validation..

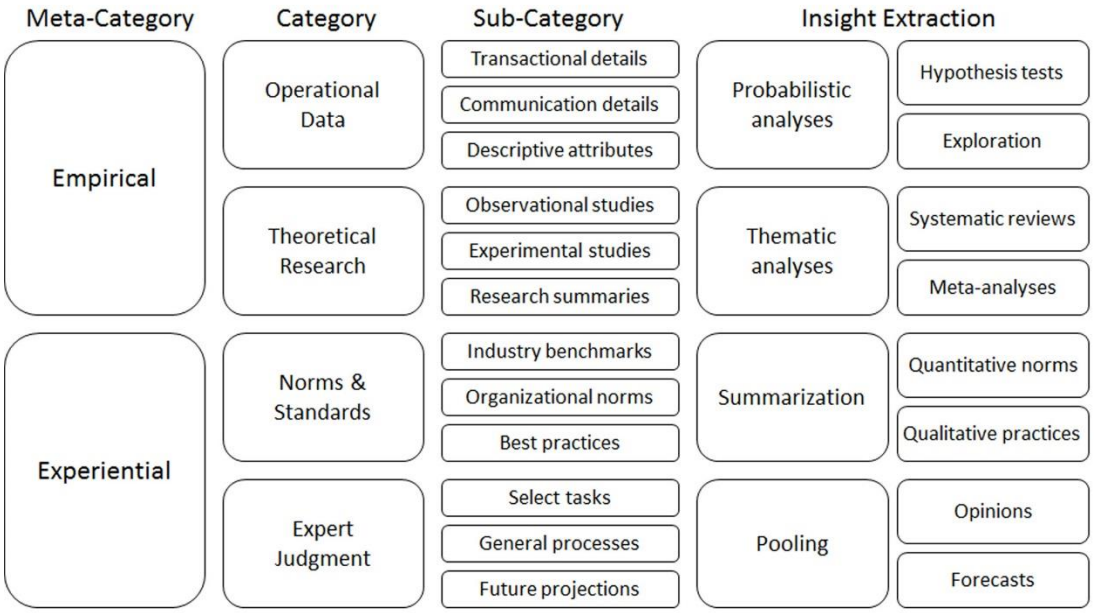
Turning to the *experiential* meta-category, the *norms & standards* category encompasses several distinct, but similarly-minded subsets, most notably *industry benchmarks,* which typically take the form of numeric yardsticks capturing activity or outcome specific peer averages, *organizational norms,* which are internal (to the organization) expected activity or outcome specific levels, and *best practices,* which usually describe tried and tested processes and means of accomplishing specific goals. Jointly, those sources of decision inputs can be considered a product of organization- or group-level practical experience, or insights that represent highly aggregate generalizations.

The second of the two experiential categories, *expert judgment,* captures the accumulated tacit knowledge of properly credentialed and practiced individuals. It can manifest itself as application-specific knowledge in the form of *select tasks,* as exemplified by one's knowledge and experience in a specific domain of practice, such as risk modelling, knowledge of *general processes,* as illustrated by familiarity with the process of commercial insurance procurement, and *future projections,* best exemplified by demonstrated expertise in forecasting outcomes of interest, such as frequency and severity of windstorms. In contrast to 'group think' derived norms and standards, expert judgment is individual and thus those individual-level inputs can very, quite considerably at times, across experts.

Assessment of Evidence

While conceptual frameworks offer essential abstract guidance, it is the supporting operationalizations that ultimately determine the degree to which new behavioural guidelines are implemented (Petter et al., 2012; Schmitt, 1994). Consequently, the general evidence typology shown in Figure 2 calls for an explicit delineation of the analytic manner by which the 'raw materials' that constitute the input into each sub-category will be transformed into decision-guiding insights. For example, the 'transactional details' sub-category of evidence will typically encompass diverse, and quite possibly voluminous pools of data which will require considerable analytical processing to yield meaningful insights, hence it is necessary to delineate at least the general insight extraction approaches. Figure 3 shows a high-level summary of the most appropriate insight extraction approaches.

Figure 3
General Evidence Typology with the Supporting Operationalization



As graphically depicted above, each of the four categories of evidence calls for a methodologically distinct insight extraction approach, with cross-sub-category variability necessitating the utilization of multiple analytic techniques. While in-depth discussion of each of the proposed insight extraction methods falls outside of the scope of this paper, some of the input category-specific operationalizations (e.g., hypothesis tests or systematic reviews) are well established and described in scientific literature, while others (e.g., exploration or quantitative norms) represents specific applications of established, though more general analytic methodologies (for more details, see Banasiewicz, 2019, forthcoming).

It should also be noted that the 3E framework is not expressly individual or group focused in its orientation, primarily because there is no clear line of demarcation between individual and organizational learning (O'Connor et al., 2007; Argyris, 1999). In any formal organizational or informal group setting some learning will be shared across members as explicit knowledge, and some will be intimately personal, ultimately producing individual level tacit knowledge (Addis, 2016; Collins, 2010; Anand et al., 2010). The overall organizational learning, however, is influenced by a combination of group, interpersonal, and contextual factors (Belle, 2016; Yates and de Oliveira, 2016; Rasmussen and Nielsen, 2011). From the perspective of organizational choice-making, the key factors that shape, or at least influence learning include group-based culture and structure (Wang and Ellinger, 2011; Lucas and Kline, 2008; Rebelo and Gomes, 2008), and individually-varied cognition, behaviors and emotions (Chiva and Alegre, 2005; Akgun et al., 2003; Vince, 2002; Bhatt, 2000). Also important in understanding, and possibly structuring organizational learning are situationally determined expected learning outcomes (Salvador and Sadri, 2018; Belle, 2016), which can be more meaningfully examined from the perspective of adaptive, generative, and transformative learning. All considered, the Empirical & Experiential Evidence framework is focused on the scope and the mechanics of 'what' types of informational inputs should be considered when pooling decision-guiding evidence, and 'how' those distinct and diverse informational inputs should be amalgamated and synthesized to give rise to singularly conclusive decision-guiding insights; the ensuing discussion of structural determinants, interpersonal differences, and learning outcomes contextualizes the 'what' and 'how' mechanics of the 3E framework.

The Impact of Structural Factors

The elusive, intangible nature of organizational culture is conducive to overlooking that important aspect of an organizational fabric (Yates and de Oliveira, 2016; Kondra and Hurst, 2008). It is usually not so with organizational structure, which, as a system of roles and responsibilities is one of the most visible, and even one of the most defining organizational features (Hinnings et al., 1996). And so while organizational culture embodies a fundamental 'feel' of an organization, organizational structure embodies the more tangibly ascertainable intentions, aspirations and purposes, which are particularly well demonstrated by flatarchies and holacracies, the newly emergent, norm breaking organizational structures (Gurpinar, 2016; Schreyogg and Sydow, 2010). In that sense, organizational structure can be as much as an instrument for efficient operation as a manifestation or even legitimation of organizational power holders' values and beliefs.

Organizational culture and structure are mutually interdependent, and both rely on the reflexivity and dynamics of organizational members to develop the necessary organizational functions, and ultimately to achieve the stated organizational objectives (Lucas and Kline, 2008; Hinnings et al., 1996). Broadly held beliefs, often summarized under the umbrella of institutional theory (Furubotn and Richter, 2005; Langlois and Robertson, 2002), suggest that organizations have to adapt to societal and sectoral values that spell out appropriate organizational forms, but the aforementioned flatarchies and holacracies cast doubt on the validity of those beliefs. The evidence emerging out of modern organizational landscape instead suggests that values of organizational power holder, particular the founders, have deterministic impact on defining organizational structures and systems – in fact, rather than having to adapt to prevailing societal and sectoral values, strong organizational power holders can effectively contribute to amending those values.

Culture and structure are also closely related to organizational learning (Lucas and Kline, 2008; Gnyawali and Stewart, 2003). While (mostly academic) research suggests that organizational learning shapes organizational structure, a view supported to a rather frequent organizational restructurings, a more pragmatic perspective suggests that organizations typically have to choose a particular system of roles and responsibilities at the very onset of their existence, before any appreciable amount of organizational learning is incurred. It thus seems reasonable to see organizational culture and structure both as determinants as well as outcomes of organizational learning, which has important implications for the 3E framework.

As graphically illustrated in Figure 1, the general process of systematic identification, assessment, and synthesis of multi-sourced, decision-related information is at the core of the 3E framework. When that process is considered from the perspective of organizational structure, centralized organizations, which are those in which all key decisions are made at the top level, produce materially different learning outcomes than de-centralized organizations, which distribute at least some of the decision-making power throughout their hierarchies (Martínez-León, and Martínez-García, 2011; Huang et al. 2011; Sorenson, 2003). By virtue of concentrating decision-making powers in the hands of relatively few individuals (typically the top executives), centralized organizational structure reduces the aggregate amount of experiential evidentiary knowledge produced throughout the organization. De-centralized organizations, on the other, operating on the basis of delegation of decision-making authority tend to generate comparatively greater, and likely also informationally richer, aggregate volumes of experiential learning.

When the general process of systematic identification, assessment, and synthesis of multi-sourced, decision-related information is considered from the perspective of organizational culture, it is clear that the empirical dimension of decision-guiding evidence generation is most directly affected (Martínez-León, and Martínez-García, 2011). By monopolizing the core elements of organizational decision-making, centralized organizations effectively discourage the pursuit deeper exploration of the available

data and applicable academic research. Recalling the three distinct dimensions of organizational learning discussed earlier – adaptive, generative, and transformative – centrally controlled organizations implicitly encourage adaptive learning, which encompasses reactive changes primarily brought about by internal pressures, while at the same time implicitly discouraging generative (acquisition of new skills and knowledge) and transformative (strategic shifts in skills and knowledge) learning. In a more general sense, the non-participatory, often rigid decision-making structure of centralized organizations tends to reduce broader organizational learning to mechanistic responses to environmental demands, while at the same time suppressing higher-order, critical thinking and social cognition rooted learning. Conversely, non-centralized organizations tend to run the risk of insufficiently inducing lower-level, i.e., adaptive, learning, while at the same time implicitly promoting, even nurturing as in the case of flatarchies or holacracies, more organic and systemic higher-order learning.

Lastly, recalling that learning takes the two somewhat distinct forms of 'doing' or behaviors (Templeton et al., 2009; Hult and Nichols, 1996), and 'thinking' or cognition (Chiva and Alegre, 2005; Akgun et al., 2003), observational evidence suggests that under most circumstances organizational structure is likely to impact the behavioral aspect of organizational learning, while culture is likely to affect the cognitive aspect of learning. Reasons for that are as follows: In the context of organizational learning, behaviors and cognitions are interrelated to the degree to which at least some of the aggregate organizational learning can be seen as an outcome of de facto experimentation. Reasonable choices, supported by a combination of reasonable assumptions and sound empirical knowledge take the form of organizational actions, the vast majority of which are ultimately speculative, given the presence of numerous environmental uncertainties. In that sense, individual organizational decisions can be – in fact, should be – evaluated as applied experiments, outcomes of which should be assessed against pre-determined evaluative benchmarks. In that context, learning is a function of 'thinking' surrounding the logic of organizational actions, and 'doing', which takes the form of executing of individual ideas. Given all that, one of the inescapable characteristics of centrally controlled organizations is that by concentrating choice-making powers in the hands of few, such organizations offer limited behavioral learning opportunities to many. And by extension, those organizations also offer limited incentives to engage broad employee base in more systemic social cognition efforts, as centralized organizational structures are most commonly associated with non-participative, predominantly mechanistic and often inflexible cultures, which ultimately provide limited incentives to engage in broad base, systemic cognitive learning.

Individual-Level Differences

A person learning from another person can be conceptualized as a process incorporating social interaction and dyadic trust as critical antecedents of effective knowledge transfer (Akgun et al., 2003; Mason and Lefrere, 2003; Vince, 2002; Fiol and Lyles, 1985). This realization is particularly important to deciphering the mechanisms that facilitate organizational dissemination of experiential knowledge, which is one of the two meta-categories of the 3E framework. Stepping a bit deeper into abstract considerations, group learning situations characterized by high trust and emotionally positive context tend to produce better organizational experiential learning outcomes, as the initially individual cognitions ('I think that…') are slowly transformed into shared cognitions ('We think that…') which ultimately give rise to shared institutionalized reality ('It is true that…') (Ashforth et al., 2011). When that happens, the experiential knowledge of organizational thought and practice leaders can be disseminated throughout the organization, effectively enhancing the aggregate knowledge base. Thus the realization of decision-making efficacy gains made possible by more thorough and systematic identification, assessment, agglomeration and assimilation of available and applicable experiential evidence hinges on creating of socially and emotionally conducive learning environments. In addition, as posited by social identity theory, closeness of organizational identification of individual member with the organization also has strong impact on learning outcomes. If being a part of the organization contributes to building a positive

self-esteem, i.e., is a source of positive social identity, readiness and willingness to learn will be greater (Wang and Ellinger, 2011; Rebelo and Gomes, 2008; Vince, 2002).

Although empirical evidence, which is the second of the two meta-categories that define the evidentiary scope of the 3F framework, is arguably considerably less 'personal', the means and the manner in which that knowledge is produced and disseminated are also directly influenced by the cognitive, behavioral and emotive aspects of group dynamics (Nakauchi et al., 2017; Rasmussen and Nielsen, 2011; Sessa and London, 2008; Gnyawali and Stewart, 2003). While cognitive diversity is generally beneficial to organizations, it can also pose challenges. Cognitive bias is ubiquitous and takes on numerous forms (Antonocopoulou and Chiva, 2007; Bell, 2016; Gnyawali and Stewart, 2003: Kahneman, 2011) – it thus follows that greater organizational cognitive diversity will also manifest itself in a wider range of cognitive bias manifestations. Greater cognitive diversity also tends to produce pluralistic data analytical and scientific research findings evaluation perspectives. For instance, probability estimation, which is one of the core elements of statistical inference, can be approached from Bayesian or frequentist perspectives, likely resulting in divergent outcomes (Zhang et al., 2017; Berger, 2010).

And there is more. While evidence gathering related group interactions may increase the confidence of the ultimate conclusion, socio-psychological research suggests that does not necessarily translate into greater decision efficacy, because of two commonly observed phenomena. The first is popularly labelled as groupthink, and it is characterized by pressure toward group uniformity stemming from overestimation of the value of the group and the corresponding scorn of the individual (Russell et al., 2015; Benabou, 2013; Schafer and Crichlow, 1996). The second of the two phenomena, biased information search, can be seen as a consequence of groupthink as it manifests itself as favouring information that supports the group's view (Kopsacheilis, 2018; Rozas, 2012; Fischer et al., 2011; Schultz-Hardt et al. 2000). In a more general sense, when confronted with diverse and divergent data analytical or research evidence, the desire for uniformity may impede critical thinking, or more specifically, may bias the examination of assumptions and hidden values associated with differently sets of outcomes and findings, ultimately leading to distorted evaluations and conclusions.

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