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Abstract

This paper focuses on origins of dynamic capabilities in multinational corporations (MNCs). Building on literature in the area of organizational memory and organizational learning, we investigate factors that contribute to subsidiaries of MNCs ability to detach themselves from obsolete knowledge and practices. To construct the theoretical framework, 11 extensive interviews with marketing and sales executives from three pharmaceutical MNCs operated in Iran were conducted. We test our hypotheses using statistical quantitative analysis of data related to 459 observations from subsidiaries of 51 pharmaceutical MNCs during years 2005-2009. We examine the quality of corrective actions taken by subsidiaries of pharmaceutical MNCs subsequent to subsidiaries failing to meet expected performance objectives. Our findings confirm a moderating role for internationalization, span, and the composition of human resources on the quality of corrective actions pursued.

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LEARNING FROM SEMANTIC INCONSISTENCIES AS THE ORIGIN OF DYNAMIC CAPABILITIES IN MNCs: EVIDENCE FROM PHARMACEUTICAL MNCs

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ABSTRACT

This paper focuses on origins of dynamic capabilities in multinational corporations (MNCs). Building on literature in the area of organizational memory and organizational learning, we investigate factors that contribute to subsidiaries of MNCs ability to detach themselves from obsolete knowledge and practices. To construct the theoretical framework, 11 extensive interviews with marketing and sales executives from three pharmaceutical MNCs operated in Iran were conducted. We test our hypotheses using statistical quantitative analysis of data related to 459 observations from subsidiaries of 51 pharmaceutical MNCs during years 2005-2009. We examine the quality of corrective actions taken by subsidiaries of pharmaceutical MNCs subsequent to subsidiaries failing to meet expected performance objectives. Our findings confirm a moderating role for internationalization, span, and the composition of human resources on the quality of corrective actions pursued.

Keywords: Organizational learning, Origins of Dynamic Capabilities, Organizational Memory, Pharmaceutical MNCs. Semantic Inconsistencies, Marketing.

INTRODUCTION

The ability of Multinational Corporations to respond to context specific challenges is a central strategic interest of researchers and practitioners, alike. While many studies provide valuable support for the role of internationalization in organizational learning in MNCs, with few exceptions (e.g., Cao, 2011; Ali et al., 2010), their connection to development of dynamic capabilities remains largely unexplored. In particular, the role that marketing divisions of MNCs, as the most immediate point of exchange with the surrounding environment, play in development of dynamic capabilities remains surprisingly overlooked and unappreciated. Interestingly, the field of marketing has contributed significantly to development of theory in the area of organizational learning, particularly in the area of organizational memory. However, neither marketing literature, nor other fields of management have expanded theoretical contributions from organizational memory beyond preliminary stages of abstract theoretical development. Therefore, development of organizational memory as the foundation for dynamic capabilities in MNCs has not received the theoretical development and empirical examination that it deserves. In our research, we embark on the path of an empirical investigation on the trajectory of extant theoretical literature in the area of organizational memory to shed light on the role that marketing divisions play in storing and utilizing organizational memory, leading to development of dynamic capabilities.

We build on evidence from Multinational pharmaceuticals and use the theoretical lens of organizational memory, to provide a more in-depth understanding of the learning processes that occur through exposure to contextual multiplicity and their role in development of dynamic capabilities. In particular, we build on extant literature on theoretical deconstruction the notion of organizational declarative memory in order to provide a more fine-grained understanding of the role marketing and sales division of MNCs play in processes through which episodes of information are acquired, undergo semantic processing, and are eventually stored. In this research, we focus on the semantic inconsistencies observed by marketing divisions of pharmaceutical MNCs and experiences that they gain through repetitive experience of such inconsistencies. While semantic processing in organizations has been the subject of interest among researchers, it is only the literature of organizational memory that provides a well-developed theoretical foundation. Therefore, we build on this area of research to develop our theoretical contribution. Guided by theory, our inquiry follows interviews with pharmaceutical executives to theorize and explicate the fundamental processes that precede the development of Dynamic Capabilities in MNCs. Subsequently, we test our hypotheses through statistical analysis of quantitative data from multinational pharmaceuticals. Finally, we seek additional confirmation for our findings through more follow up interviews.

LITERATURE REVIEW

Organizational Memory and Organizational Knowledge

'Organizational memory' refers to stores of knowledge that are located in various locations inside or outside of organizations and at their disposal (see Moorman & Miner, 1997, 1998; Walsh, 1995; Walsh & Ungson, 1991). Organizational memory influences organizational responsiveness through reflecting past acquired knowledge onto organizations' present activities (Hackbarth, 1998) and is strongly related to the ability of organizations learning capacity and their ability to manage knowledge they possess (Antunes & Pinheiro, 2019). Stored in various organizational repository bins (Walsh & Ungson, 1991), organizational memory can be external or internal to the organization. Internal repositories include those of more implicit natures such as individuals' memories or characteristics, and organizational culture. They can also take more physical and tangible forms such as organizational transformations, organizational structure, and even the ecological aspects of the organization. Firms can also access memories that are stored in bins external to the organization. Organizations' ability to access these bins and retrieve stored memories depends on directories at their disposal (Anand et al., 1998), and is critical to their quick and appropriate response to environmental developments. Firms that are unable to retrieve stored information in time are doomed to repeat the same mistakes that were made before.

Organizations may possess knowledge in form of recorded and explicit information, or may hold it in implicit forms, or as *'soft knowledge'*. Soft knowledge refers to knowledge that is not explicit and cannot be easily communicated (Anand et al., 1998) and which is necessary for proper appropriation of value from more explicit forms of knowledge. While explicit knowledge is transferable in different forms and can be acquired through different mechanisms, soft knowledge is often what is developed on the foundation of information that has been acquired by an organization over the course of time and that has been deposited in various organizational repositories. Therefore, soft knowledge is tacit, invisible and is often associated with causal ambiguity.

Procedural Memory and Declarative Memory

Organizations benefit from two forms of memory: procedural memory, and declarative memory (Moorman & Miner, 1998). Procedural or implicit memory, also referred to as aural memory (Berliner, 1994) and motor memory (Pressing, 1988), consists of the stored information that is required as underlying skills to perform tasks (Moorman & Miner, 1998; Nelson, 1982). Unlike procedural memory, declarative functions through more deliberate retrieval processes. Declarative memory which consists of facts, concepts, or events (Anderson, 1983; Cohen, 1991) is less task-oriented (Moorman & Miner, 1998) and does not confine organizations' actions to preexisting patterns and procedures (Singley & Anderson, 1998). The explicit, more abstract nature of declarative memory and its lesser task-dependence compared to procedural memory positions it as a more reliable foundation to respond to situations that require a degree of novelty, particularly in situations where access to cutting-edge knowledge is required to sustain a leading competitive position (Maidique & Patch, 1988).

Processes of Declarative Memory

Organizations develop their declarative memory through inclusion of additional information from their environments and assigning meaning to that information. Organizations differ on the sources (directories) through which they access information. Also, each organization is unique in terms of the meaning it assigns to the collected information because of existing idiosyncrasies. Therefore, from the moment an organization encounters any contextual occurrence, the information corresponding to that occurrence is subject to that organization's processes. However, in spite of such processing, collected information initially becomes stored as archived records of relatively raw episodes of facts. This stored information forms the foundation of an organization's *'Episodic Memory'* (Seifzadeh, 2012). Existing archives within organizations' various sections with exposure to the external environment often constitute the stores of Episodic Memory. However, usability of information stored in Episodic Memory requires an organization to internalize that information, a process which also involves assigning meaning and sense-making.

The meaning assigned to accounts archived within an organization's stores of Episodic Memory depends on cognitive resources that the organization has developed over time. This cognitive capacity which forms organizational *'Semantic Memory'* is the main source of divergence between organizations and is the inception point of difference in organizations' response to the phenomena they encounter (Seifzadeh, 2012). The transformation that occurs to information as the result of the interaction between Episodic Memory and Semantic Memory forms an organization's Declarative Memory. It also lays the foundation for further expansion of an organization's cognitive capacity and its stores of Semantic Memory, which will later be reused to assign meaning to information that in the future will be retrieved from the stores of Episodic Memory.

Environmental Dynamism, Declarative Memory and Dynamic Capabilities

Environments of organizations often experience dynamism resulting directly or indirectly from actions taken by other organizations. To remain operational and relevant to their markets, organizations need to respond to changes in their environment; such changes can have roots in other organizations' competitive actions, or changes in market trends. The speeds by which organizational responses need to be developed and implemented depend on the nature and magnitude of the change that the environment is undergoing. Some organizations are capable of improvisation which involves converging the processes that involve internalizing, designing, and implementing responses to a degree that they almost seem extemporaneous (Moorman & Miner, 1998; Weick, 1993). Organizational improvisation represents organizational actions that are neither random, nor necessarily pre-planned (Follett, 1930; March, 1976), and therefore involved a *'semi-ordered'* activity (Pressing, 1984). Improvisation allows organizations to maintain coherence in responses through internalization of environmental factors when developing responses.

Organizations that are better at improvising are those that internalize external stimuli, design a response, and implement the response quickly to a degree that it might seem as if the design and implementation are not but concurrent occurrences. Memories that are of procedural nature are accessed automatically which can tremendously shorten the design process. Therefore, procedural memory has been suggested to lead to more speed when organizations improvise (Moorman & Miner, 1998). Declarative memory, however, is less efficient when speed of response is critically important. Retrieving information stored as declarative memory requires deliberate and conscious action. Therefore, designing responses based on declarative memory take more time before implementation. However, while improvisation that is founded on stored declarative memory is not generally characterized by speed, it can lead to organizational actions that are novel and innovative (Moorman & Miner, 1998).

Environments of organizations can experience moderate changes or they can undergo abrupt change, stemming from disruptive effects of other organizations' *'creative destruction'* (Schumpeter, 1934). In markets experiencing moderate change, industry structures remain stable, market boundaries are clearly defined, market actors are identifiable, and occurring changes are roughly predictable (Eisenhardt, 1989). On the other hand, markets undergoing disruptive change involve high ambiguity regarding market actors and shifts that blur market boundaries (Eisenhardt & Martin, 2000). Market disruption can redefine the market structure with such velocity that many organizational resources or capabilities run obsolete (Eisenhardt & Martin, 2000), leading to new market paradigms with high degree of inherent uncertainty (Teece et al., 2016). Organizations that are unprepared to respond to radical paradigm shifts in the environment have little chance to extend their existence beyond the point that the disruption takes effect.

The question of whether and how firms can survive disruptions of their industry has given rise to a trend in organization research that emphasizes the value to possess capabilities that are dynamic and which do not lose their value in face of change (e.g., Eisenhardt & Martin, 2000; Makadok, 2001; Miller & Shamsie, 1996; Teece & Pisano, 1994; Teece et al., 1997). However, the essence of such capabilities has been surrounded by much ambiguity, attributed to knowledge (Miller & Shamsie, 1996), managerial cognitive capabilities (Helfat & Peteraf, 2015), organizational learning routines (Zollo & Winter, 2002) which co-evolve into firm-specific routines (Eisenhardt & Martin, 2000; Nelson & Winter, 1982), and managerial capabilities (Adner & Helfat, 2003). Organizations can build on their dynamic capabilities to enhance their absorptive capacity (Cohen & Levinthal, 1990; Zahra & George, 2002). Therefore dynamic

capabilities form the foundation of success in Schumpeterian environments (Schumpeter, 1934, 1942) and are inseparable from successful business models (Teece, 2018). Since dynamic capabilities are organizationally embedded and non-transferable (Makadok, 2001), they form reliable sources for organizations to maintain their competitive edge. A main point of convergence in this trend has been a strong consensus on the intangible characteristic of such capabilities which enable them to transcend existing markets and industries to find relevance within evolving market paradigms. Therefore, knowledge-based resource and capabilities, as intangible sources of competitive advantage, have been labeled as potential sources of dynamic capabilities in organizations.

Organizations that rely on their existing pools of knowledge face strong challenges to continue their existence as competitive actors unless they consistently continue to utilize their knowledge resources that remain relevant to the environment. Organizational knowledge which is stored as '*organizational memory*' in various repositories can take different forms, from physical artifacts to implicit and tacit forms (Moorman & Miner, 1998; Walsh & Ungson, 1991). The memories at disposal of each organization which can be procedural, retrieved automatically, or declarative which requires more deliberation when being accessed differ in the utility they provide, and as discussed earlier, their complementarity makes them both necessary for organizational success.

Procedural and declarative memory deposits do not respond to fundamental and disruptive change similarly. The temporal precedence of declarative to procedural memory plays an important part in signifying its critical role in organizational survival in face of disruptive market patterns. An organization's declarative memory itself consists of '*episodic*' and '*semantic*' memory components (see Tulving, 1972, 1983) for '*semantic*' and '*episodic*' memory in the literature of Psychology). Episodic memory describes an organization's memory of events, occurrences, and information that involves time and contextual dimensions (Seifzadeh, 2012). Internal and external archival repositories contain knowledge and information of such nature and organizations can refer to their accessible directories to identify their location and retrieve their information, if needed.

But '*semantic memory*' entails more conceptual and cognitive elements of organizational knowledge and therefore can deeply influence an organization's declarative memory, and subsequently the organizational response. Semantic memory refers to organizational cognitive and conceptual understanding and enables the organization to assign meaning to other encountered situations, when semantic memory is retrieved to be used as a point of reference (Seifzadeh, 2012). Organizations develop their semantic memory through referring to information stored in stores of '*episodic memory*' and undergoing a recursive process of cognitive sense making with the use of already existing stores of '*semantic memory*'.

Organizations that are capable of retrieving and utilizing their stores of semantic memory put themselves in a better position to improvise responses coherent responses to disruptive change. However, not all levels of improvisation can provide appropriate responses to market disruptions. Improvisation may be at preliminary levels with slight modifications or adjustments (Bailey, 1980; Berliner, 1994; Hatch, 1997; Moorman & Miner, 1998), formulaic which involves a stronger departure from routines, yet remaining loyal to fundamentals (Moorman & Miner, 1998; Weick, 1996), or it can be theme improvisation which departs completely from an earlier practice (Berliner, 1994; Hatch, 1997; Moorman & Miner, 1998; Weick, 1993). We posit that it is only the capability to perform the latter type of improvisation that can prepare organizations with the ability to survive Schumpeterian market disruptions. We also claim that organizations

can develop this capability only through learning which occurs as the result of consistently questioning and reexamining the validity and value of existing stores of semantic memory, which is influenced by encountering novel situations for which records are stored in the organization's episodic memory.

While each organization uses the cognitive elements within its semantic memory to conceptualize information from the episodic memory, possible deviations from its 'semantic logics' inspire the organization to undertake re-conceptualization and refinement of the knowledge stored in its semantic memory repositories. Organizations that make more frequent references to their stores of semantic memory are more likely to detect contextual deviations and inconsistencies between their stores of semantic memory and the context, therefore, they are more likely to take steps to refine their stores of semantic memory. Consequently, stores of semantic memory in such organizations are more likely to be relevant to the situations that they face, or are more likely to be revised when necessary, resulting in lesser likelihood of getting caught off-guard and develop inappropriate responses.

Internationalization and the Development of Organizational Memory

Organizational knowledge and capabilities have often been credited as the cornerstone of successful internationalization. MNCs build on their knowledge stored in their various memory bins to formulate successful entry strategies and to appropriate resources in their favor. However, contextual differences between different markets may render some of the knowledge stored as memory in MNCs as irrelevant. This provides MNCs with the opportunity to further enhance their knowledge capacities through enriching their stores of memory. Some theoretical perspectives on internationalization have focused on potential learning benefits that arise when MNCs find exposure to their host country environments (Ruigrok & Wagner, 2003). Building on Carlson's (1966) work on the foreign decision process in internationalization, the highly regarded Uppsala model (Johanson & Vahlne, 1977, 1990; Johanson & Wiedersheim-Paul, 1975) suggests that perceptions of proximity or psychic distance-influence the sequence through which MNCs enter new markets (Child et al., 2009). The model implies that MNCs build on their own sources of knowledge of operations – i.e., their memory - to develop responses to context-specific challenges when knowledge directly related to the environment is difficult to access (Forsgren, 2002). Environmental differences and ongoing change in international contexts have led some researchers to postulate the capacity to reconfigure their resources and capabilities to meet international contingencies as essential to success in international strategy (Kogut & Singh, 1988; Li, 1995). However, the ability of MNCs to reconfigure their resources and capacities will be substantially hindered when contextual conditions for one of their subsidiaries undergo abrupt and disruptive change.

MNCs with more developed dynamic capabilities are in a better position to respond to contextual changes or differences. While past research has emphasized usefulness of such capabilities, the triggering mechanism for their activation and their development process remain obscure. To this end, in the following section, we build on a set of semi-structured interviews with marketing executives from pharmaceutical MNCs as part of an exploratory effort to develop a theory for development of dynamic capabilities. We build on the conceptual development of the notion of Organizational Memory which has been presented earlier in this research. We then proceed with testing a set of developed hypotheses on a pooled sample of pharmaceutical subsidiaries.

Semantic Inconsistencies and Strategic Action in Pharmaceutical MNCs

One of the main challenges facing research focusing on dynamic capabilities is the measurement of effects that relate to them. Past research has suggested managerial evaluations, financial data experiences, and managerial/employee experiences to provide best opportunities to measure such effects (Laaksonen & Peltoniemi, 2018). The link between marketing and development of dynamic capabilities has recently attracted more attention among researchers (Wang & Kim, 2017). Marketing divisions of pharmaceutical MNCs provide an ideal sample for the analysis of learning and development of dynamic capabilities for several reasons. First, due to technological sophistication and high level of investment required to develop many pharmaceutical products, emerging economies and less developed countries are highly dependent on products developed by pharmaceuticals with developed country origins. As a result, there is a high level of internationalization among major pharmaceuticals into contexts with more volatile characteristics. Such contexts, on the other hand, often lack support mechanisms to protect intellectual property rights which results in challenges arising from development of generic versions of pharmaceutical products by public sector institutions, when a degree of domestic technological and knowledge capability exists. Second, many emerging economy contexts experience volatility that results from market liberalization policies and development of regulations, which in turn, influence the performance of subsidiaries of pharmaceutical MNCs. Finally, marketing divisions constitute the most immediate point of interaction between MNCs and their surrounding context and often times, they also represent the most immediate locus of change in organizational practices based on detected changes and inconsistencies.

In this section, we build on 11 interviews with marketing and sales executives from subsidiaries of three pharmaceutical MNCs that operate within an emerging economy state, Iran. While all three subsidiaries have been selected such that they operate within the same country, their three corporate parent MNCs have different countries of origin: One of them is a major Northern European pharmaceuticals (MNC N) with over 100 subsidiaries worldwide. The other one is a GCC based company (MNC G) with foreign ownership and with 10 subsidiaries located in GCC and Northern Africa, and the third is an MNC headquartered in the emerging country of interest (MNC T) with three foreign subsidiaries in two other neighboring countries. The interviews were mainly conducted in English. Where English was not an available option, interviews were recorded and translated. The translations were then reviewed by a third party to compare against recordings for verification.

Learning from the Environment

Theories of the multinational corporation (MNC) posit that organizations benefit from transfer of resources and knowledge from the multiple environments to which they are exposed and that as a result they can develop competitive advantages that can be applied to their future market entry endeavors (Ruigrok & Wagner, 2003; Fayerweather, 1978). The literature on Organizational Memory suggests that organizations process information from their environments through the tacit knowledge stored as semantic memory. Semantic memory resides within individuals in the organization, but it also is stored as analytic reports and historical data corresponding to previous organizational experiences. Through our interviews with executives with three subsidiaries from MNCs N, G, and T, they recounted different mechanisms of

learning that occurred and the transfer of the newly obtained knowledge to the corporate parent. A high-ranking marketing executive from the subsidiary of MNC N put it as:

“Our interaction with domestic partners is constrained by our guidelines....We follow a set of policies and protocols that correspond to different scenarios we might face....[the subsidiary] archives collected information and processes it into the platform provided by the corporate parent. Every subsidiary across the globe operates on the same platform which makes information dissemination coordinated and accessible.”

The marketing executive at the subsidiary of MNC G provides a description of corporate learning that occurs through their subsidiary as:

“The majority of the subsidiaries of our corporate parent are operating within Arab speaking regions in the Middle East and North Africa....[besides us] there is only one other subsidiary that is not located in such region. Therefore, our corporate headquarters is very sensitive to the information that we send their way, since they believe that we are different from the other subsidiaries...[However] this also makes our information [the least] beneficial to be used in management of our other subsidiaries....[our corporate parent] is more concerned with making sure they know enough about our market [here] to make more accurate assessments in the future.”

Learning from Corporate Parent

MNCs leverage their resources and capabilities-either tangible or intangible- to explore and exploit opportunities in markets they enter. Through establishing subsidiaries in attractive markets, MNCs seek to put themselves in a position to take advantage of opportunities. However, success will be difficult to attain unless relevant corporate level capabilities are transferred to each subsidiary. Therefore, MNCs attempt to enrich organizational memory at the subsidiary level through granting them access to their own stores of memory or reconstructing aspects of memory that are useful at the subsidiary level.

The analysis of the interviews revealed several factors that influence frequency and quality of subsidiaries accessing organizational memory stored and processed by their corporate parents. One such factor identified was through planned and occasional presence of corporate employees in the subsidiary and with the purpose of transferring knowledge to the subsidiary. The marketing and sales VP at MNC T which also managed operations in the main subsidiary at the home country states:

“We build on a set of guiding principles and expect that our subsidiaries follow them as well...Our operations and performance at home have been very successful and this is what allows us to pursue internationalization and sales volumes beyond our borders. Here [at MNC T] we have to rely on our good experience at home and try to make sure that our subsidiaries follow the same standards. I personally, spend almost a quarter of the year at our two subsidiaries in order to make sure they build the most on experiences we have acquired at very high cost.”

A similar mechanism can be identified in the remarks made by a high-level marketing executive at the subsidiary of MNC N:

“While most of our subsidiary employees, even at management positions, are local, we always have one or two consultant type corporate employees who are from [the MNC home country]. The consultants remain with us for two year periods, after which, they are usually transferred to either the corporate headquarters or take a similar position in another subsidiary. Since our office [the subsidiary] serves as the regional hub, we also have [MNC home country] nationals that serve three to six month internships with us. Their main objective is to become familiar with our operations here and take that experience with them to their corporate positions.”

Another identified mechanism that influences the access of MNC memory reserves by the subsidiary is the degree of autonomy granted to each subsidiary by the corporate parent. While less subsidiary autonomy encouraged subsidiaries to rely on organizational memory already available at the corporate level, higher subsidiary autonomy provided them with more flexibility to develop their own stores of memory and in the process, facilitated enrichment of stores of corporate knowledge through information funneling in from subsidiaries.

Internal Dynamics of Subsidiaries

The interviews also revealed the important role of internal dynamics of subsidiaries resulting from composition of employees in the direction and mechanism of memory enrichment and subsequently the quality of learning in subsidiaries and pharmaceutical MNCs. The balance between local employees and MNC home country employees was a prominent topic raised during all of the conducted interviews. The three subsidiaries from MNCs N, G, and T differed in regards to this balance: whereas employees in the studied subsidiaries from MNCs N and T where predominantly local (with MNC T having a local origin), the balance in the subsidiary from MNC G was mainly weighted toward expatriates. During an interview, a local executive in the marketing department of the subsidiary of MNC G mentioned:

“...We lose opportunities because of the time it takes to bring [executives with home country nationality] onboard...[they] often make it their first priority to receive confirmation from the corporate office before taking action and then it could be too late...”

In contrast, a marketing executive from the subsidiary of MNC N credits the prominent role of local executives in decision making roles with the success in the market:

“The [employees with home country nationality] are mainly consultants or interns. Their numbers of few.....this is good evidence of the degree of trust the [executives with home country nationality] have in our capabilities....[and we] have not disappointed them.”

Responsive Actions to Lower Performance

Through our interviews, we identify two main categories of actions taken by marketing and sales departments of subsidiaries of MNCs N, G, and T. The two categories differ in the direction of focus. While one category of actions includes inward approaches that focus on refinement of existing practices, increasing efficiency and reapplying existing knowledge in the organization's various memory bins, the other approach is outward looking. The outward looking approach reexamines the environment in order to make necessary changes to the practices adopted by the subsidiary. We found the dominant action that falls into the outward category to be the practice of market research. Our interviews reveal that in subsidiaries of MNCs N, G, and T, when uncertainty exists about the accuracy or relevance of knowledge on the surrounding environment, MNC subsidiaries rely on market research practices to acquire new knowledge and update their stores of organizational memory.

Building on the literature on organizational memory and dynamic capabilities, and consistent with findings from the 11 preliminary interviews which were conducted, several

hypotheses have been proposed. We focus on actions taken by subsidiaries, subsequent to their missing of projected and expected performance objectives. Consistent with the nature of pharmaceutical subsidiaries as economic entities, we expect that subsequent to reports of underperformance, marketing and sales departments of subsidiaries take corrective measures to return to expected profitability. The corrective measures in the marketing and sales departments may include increase in marketing and advertising budget, changes in distribution channels, or market research. Therefore:

H₁ Subsidiaries of pharmaceutical MNCs take corrective action subsequent performance assessments that indicate they have not met expected performance objectives.

We also expect that pharmaceutical MNCs with a larger number of subsidiaries to have further exposure to semantic inconsistencies. This means that following taking steps and actions based on the available knowledge stored as their declarative or procedural memory, there is a higher likelihood that because of fundamental difference or change in their environment, they receive feedback that is inconsistent with their semantic expectations. Therefore, we argue that pharmaceutical MNCs with a larger number of subsidiaries are in a better position to appreciate such semantic inconsistencies and subsequently distance themselves from actions that have led to the unexpected outcome, instead of trying to repeat them with greater efficiency. Past research has suggested that when facing dynamic environments, organizations better equipped with dynamic capabilities may lean towards actions favoring reconfiguration instead of restructuring (Girod & Whittington, 2017). Among the three main responsive actions identified through our interviews, market research stands out as a corrective measure that focuses on identification of the environment and development of fresh stores of memory, instead of refining existence processes based on available stores of memory. The consequence of market research findings could play an enabling role in subsidiaries' and their corporate parents' distancing themselves from practices previously adopted. Therefore, we also take it as fundamental behavioral difference between organizations in understanding the need to let go of practices no longer relevant. Building on preceding arguments we suggest the following hypothesis:

H₂ The number of subsidiaries managed and operated by pharmaceutical MNCs moderates the relationship between lower than expected performance and subsequent corrective actions; subsidiaries of MNCs with larger number of subsidiaries are more likely to undertake market research as the primary response to low performance compared to subsidiaries from MNCs with fewer subsidiaries.

Similar to presented for the number of subsidiaries, MNCs with greater super-national dispersion are in a more likely position to experience environmental feedback which is inconsistent with their previous experiences. Therefore:

H₃ The degree of internationalization of pharmaceutical MNCs moderates the relationship between lower than expected performance and subsequent corrective actions; subsidiaries of MNCs with greater super-national dispersion are more likely to undertake market research as the primary response to low performance compared to subsidiaries from MNCs with fewer subsidiaries.

The degree of autonomy granted to subsidiaries of MNCs also plays an important role in the quality of responsive actions taken at the subsidiary level to improve performance and meet the set objectives. Our preliminary interviews reveal that the locus of primary stores of organizational memory shifts between the corporate parent and the subsidiary based on the

degree of autonomy perceived by the subsidiary. Subsidiaries with greater autonomy have much more latitude in developing context-specific stores of memory which are relevant to ongoing environmental dynamics.

The transfer and access of organizational memory also becomes possible through individuals that form the organization. Corporate level employees and executives who take up responsibility in subsidiaries become vessels for transfer of corporate level knowledge to subsidiaries and vice versa. However, the composition of the subsidiary's human resources and the balance between the number local and corporate level employees plays an important role. The preliminary interviews of this study demonstrate that in the subsidiaries of MNCs N, G, and T, a more balanced composition of human resources in terms of country of origin facilitated mutual learning and access to developed stores of memory. Therefore:

H₄ The balance between the number of local employees and those from the MNC home country moderates the relationship between lower than expected performance and subsequent corrective actions; subsidiaries with more balanced human resource compositions are more likely to undertake market research as the primary response to low performance compared to subsidiaries from MNCs with fewer subsidiaries.

METHODOLOGY

In what follows, we put these hypotheses to empirical testing. First, a description of the data and sampling techniques used is provided. Then, we proceed with explaining the methodology and measurement of the variables. Finally, the results from statistical analysis are explained and discussed.

Sample

The sample for this study consists for data from 51 corporations that operate as pharmaceuticals. The data for this study came from a proprietary dataset that was constructed based on primary and secondary sources. The 51 corporations were randomly selected from those pharmaceuticals with a minimum of 3 subsidiaries and with market presence in at least one country besides their country of origin. Stratified sampling techniques were employed to select 3 subsidiaries from each corporation and 3 observation events for each subsidiary from the years 2005 to 2009. The observation events included performance assessments that fell below expected objectives and corrective actions taken between the initial assessment and the next assessment, allowing a maximum of 6 months from the time that the performance shortcoming was reported. The data was used in a pooled sample consisting of a total of 459 observations. The following variables were measured and used based on the dataset:

Performance gap

A dichotomous variable was used to indicate if performance evaluations of the subsidiary fell below expected objectives or if the subsidiary was able to meet them. To code instances that the subsidiary met the objectives or even outperformed them, 0 was used, while instances of lower performance were coded as 1.

Corrective action

A dichotomous variable was used to distinguish between the alternative actions taken by subsidiaries in order to respond to their low reported performance; 1 was used to code instances where market research was used as the main corrective step and 0 was assigned to other alternatives.

Number of subsidiaries

A simple count of all subsidiaries operated by the MNC at the time of the observation even was used to measure this moderating variable.

Balance of employees

The ratio between of number of local employees to the number of MNC home country employees was calculated. The Z-score for the ratio was calculated and used for this variable.

International dispersion

The product of '*the number of international markets present*' and the ratio of '*the number of international markets present*' and '*total number of subsidiaries*' was used to calculate the measure for this variable.

RESULTS

Considering the dichotomous dependent variable in the model, logistic regression analysis was used to analyze the data, where a significant and positive beta increases the odds of the hypothesized outcome while a significant and negative beta has the opposite effect (Bilimoria & Pederit, 1994). Table 1 includes descriptive statistics, and Table 2 summarizes the correlations between variables. Table 3 reports the tests for Hypotheses 1, 2, 3 and 4. In Table 3, Model 1 presents the based model with only the control variables, whereas Model 2 represents the test for the direct relationship between Performance Gap and Corrective Action. The result indicates a positive and significant relationship ($p < 0.01$) which lends support to H1.

Table 1				
DESCRIPTIVE STATISTICS				
	Mean	S.D.	Min.	Max.
Span	9.34	7.096	5	128
Number of International Regions	3	8.2978	3	80
Employees	0.8798	9875.56	82	42000
Size of Operations (\$) million	65	4657.55	2.31	18000
Years of Operation	18	21.35	6	86

Table 2
CORRELATIONS AMONG ALL VARIABLES ^a

	1	2	3	4	5	6	7	8
1. Performance Gap	1							
2. Corrective Action	0.117*	1						
3. Number of Subsidiaries (Span)	0.057*	0.085*	1					
4. Degree of Internationalization	0.067*	0.203**	0.456**	1				
5. Balance of Employees	0.013	0.024 [†]	0.010	0.005	1			
6. Performance Gap × Span	0.057*	0.031*	0.057*	0.227**	0.222**	1		
7. Performance Gap × Internationalization	0.066**	0.055*	0.248**	0.067*	0.029 [†]	0.723**	1	
8. Performance Gap × Balance of Employees	0.012	0.019 [†]	0.020 [†]	0.018 [†]	0.013	0.010	0.005	1

^a Standardized coefficients are reported
 N= 459 subsidiaries (Span, Internationalization and HQ host country staff for a total of 51 corporations. Balance of staff, Autonomy, New product market introduction, subsidiary management change, subsidiary ownership and subsidiary performance were measured for each individual subsidiary for a total of 153 subsidiaries and 459 event observations).
[†] $p < 0.1$
 * $p < 0.05$
 ** $p < 0.01$

Model 4 includes the tests for Hypotheses 2, 3 and 4 which focus on the moderating effects of Number of Subsidiaries, Degree of Internationalization and Balance of Employees. In Model 4, which is the full model with all of the hypothesized interaction effects, we find support for Hypotheses 2 ($p < 0.05$) and Hypotheses 3 ($p < 0.01$). However, Hypotheses 4 is only marginally supported ($p < 0.1$).

Model 4 in Table 3 shows an improvement in the reported R^2 which has increased from .10 in Model 1 to .18. We also observe a strong improvement when we compare the hit rate for Model 4 (68.32%) with the hit rate for a random proportional chance model (54.31%). We find the chi-square values for all models to be significant which indicates satisfactory fit and that the results from the logistic regression analysis can be interpreted in a meaningful way.

Table 3
RESULTS OF LOGISTIC REGRESSION ANALYSIS OF THE RELATIONSHIP BETWEEN SUBSIDIARY PERFORMANCE GAP AND CORRECTIVE

Independent variables	Model 1	Model 2	Model 3	Model 4
Control variables				
Subsidiary Management Change	0.03	0.03	0.02	0.02
New Product Market Introduction	0.10*	0.09*	0.11*	0.12*
Subsidiary Ownership	0.04	0.03	0.03	0.03
Effect of Subsidiary Performance on Corrective Action				
Subsidiary Performance Gap		0.073*	0.076*	0.078*
Moderators				
Number of Subsidiaries (Span)			0.10*	0.12*
Internationalization			0.15*	0.23*
Balance of Employees			0.07	0.03
Interactions				
Span × Responsive Action				0.07*
Internationalization × Responsive Action				0.11**

Balance of Employees × Responsive Action				0.02 [†]
R ²	0.10	0.13	0.15	0.18
Δ R ²		0.03	0.02	0.03
^a Standardized coefficients are reported N= 459 subsidiaries (Span, Internationalization and HQ host country staff for a total of 51 corporations. Balance of staff, Autonomy, New product market introduction, subsidiary management change, subsidiary ownership and subsidiary performance were measured for each individual subsidiary for a total of 153 subsidiaries and 459 event observations). † p<0.1 * p<0.05 ** p<0.01				

Follow up Confirmatory Interviews

To confirm findings from the statistical analysis, 6 follow up interviews were conducted with marketing and sales executives from the subsidiaries used for preliminary interviews of this study. The interviews were designed as semi-structured interviews with a focus on events following the subsidiary failing to meet performance objectives set by the corporate parent. The interviews reveal a meaningful difference between actions taken by the subsidiary from MNC N compared to those taken by subsidiaries from MNCs G & T. Whereas executives from the subsidiary of MNC N made references to change in market trends, the narrative of executives of MNCs G and T was dominated by a focus on internal auditing. When executives of the three subsidiaries were asked to list the top 5 actions likely to be taken in case of another instance of low performance, four of the ten items proposed by executives from the subsidiary of MNC N were in line with items such as additional market research or hiring an external consultant, while a similar reference was made only for a total of twice – out of 20 mentioned items- by the four executives from subsidiaries of MNCs G and T.

Observations and Predictions: 2009-2019

The decade following the interviews and the period of data collection (2005-2009) was turbulent in terms of economic, social and geopolitical developments. We tracked performance and strategic actions by MNCs N, G, and T during the following decade and several face-to-face, telephone and email interviews were conducted during the time period. Since 2009, MNC N has maintained its presence in almost every region it operated in 2009, and has expanded into several more regions. Due to idiosyncratic and context-specific challenges related to geopolitical factors such as international sanctions imposed on certain national economies, it has modified its operations to offer alternative services not subject to national or international scrutiny. In an interview with a regional director, early detection of emerging trends was suggested as an underlying reason for timely and successful transition:

“...and there were certain indicators that offered clues about the direction that things were taking. There were a few times in the past that we were taken quite off-guard in the past, like in 1998 and again in 2001. Unlike what happened in the past, we don’t want to completely leave, because our return will be a much bigger challenge. What we have tried to do is to make changes in what we offer and how we offer it, with our dealings with distributors, and with our contractual arrangements...”

Both MNCs G and T found less success, with MNC G suffering from rapidly increasing regional tensions among GCC nations, issues related to the Arab Spring and shifting competitive dynamics resulting from emerging domestic competitors. MNC G has since limited its presence in several contentious geographic areas, while they have capitalized on their experience in failed markets to maintain their presence in others:

“...regional tensions have been very harsh on us. They have significantly impacted how we manager our operations, but also our ability to build durable relationships with local partners. We are determined not to repeat some of the same mistakes we made in the past and keep our presence healthy in our remaining markets.”

MNC T cased most of its operations in international markets since 2016 and limited its presence in form of exports. It is expected that despite increasing downturns in international trade, MNC N, which has considerable international experience, will continue its presence in most of its regional markets and will localize its products and services to adapt to changing dynamics.

DISCUSSION

This paper has intended to provide a better understanding of the processes that involve development of several types of organizational memory in MNCs and the role of organizational memory in MNCs' ability to respond to disruptive changes in markets within which they operate. Organizational knowledge is understood to constitute the knowledge that is stored in various repositories internal and external to organizations and which is available to the organizations for use. Therefore, organizational memory can be considered to form the foundation of responses that MNCs design and implement in face of developments that occur in their competitive environments.

However, developments in competitive environment can take different forms and can range from superficial dynamics with little change to the establishment of an industry to disruptive changes that can put an end to the existence of a market or industry. Accordingly, MNCs can benefit from their stores of memory in their different forms. In face of regular competitive dynamics, organizations can utilize their knowledge resources that are stored in their memories to develop competitive advantage over their direct and indirect competitors. They can even build on their declarative and procedural memory deposits to improvise responses and position themselves as agile competitors. However, in face of abrupt change and disruptive forces to the market, organizational memory can not only lose value, but also become a harmful competitive liability.

The main objective of this paper is to shed light onto the micro-foundations of dynamic capabilities in MNCs and what allows their subsidiaries to distance themselves from constraining effects of semantic memory in face of abrupt changes in the structure of their environment. We have proposed that in face of disruptive change, semantic memory will not only lose value but will also inhibit organizations from providing responses that are relevant. Through our interviews we have investigated how subsidiaries of pharmaceutical MNCs are able to build on the knowledge at their disposal as their organizational memory to put themselves in a position to further refine their semantic memory. Through access to different market environments, MNCs can develop the necessary memory to help them identify when their semantic memory has likely become invalid and can have it rebuilt from new records of episodic memory and through taking a grounded approach and inductive reasoning.

CONCLUSION

Our theoretical contributions are two-fold. First, we contribute to the literature of organizational memory through unpacking the notion of organizational memory and have explicated the relationship between its different dimensions. Past research (e.g., Moorman & Miner, 1998) while identifying some dimensions of organizational memory have neither established their relationships, nor have explicitly mentioned their origins and the mechanisms through which they have been acquired. Moreover, most of past research has failed to go beyond one level of organizational memory and has taken a simple approach in identifying dimensions of organizational memory. This paper also contributes to the field of International Business through further explication of the origins of dynamic capabilities in MNCs. In this research, we establish the mechanisms through which MNCs and their subsidiaries learn from one another in co-creation of MNC-wide dynamic capabilities.

The findings of this paper are also not without implications. The findings of this paper suggest a new mechanism for learning through internationalization and posit that MNCs can persist in maintaining relevance of their subsidiaries through a consistent effort to update their stores of episodic memory. MNCs that put in place mechanisms to scan, monitor, and internalize occurrences in their surrounding environment maintain their agility over time. Furthermore, MNCs that consistently encourage innovation can avoid falling into the trap of sacrificing relevance for the sake of perishable efficiency. Such MNCs can better identify when their cognitive barriers start becoming their limitations, distance themselves from such limiting factors in time, and build new sources of knowledge that would allow them survive and compete.

LIMITATIONS AND FUTURE RESEARCH

While our research provides a novel perspective of the role that marketing activities play in the development of dynamic capabilities in MNCs, it is constrained by some limitations that also present opportunities for future research. First, while the process of qualitative data collection has maintained its commitments to specified guidelines, it is almost inevitable to separate the process from interpersonal influences that may occur during face-to-face interviews. Although there are very clear guidelines to minimize such influences, they will never be completely eliminated. In our mixed-method approach, we have tried to further eliminate such influences by validating our findings in a multi-stage data collection and analysis process. Further research and additional studies can help increase reliability of the measures identified and to provide more validity to findings.

Second, our study builds on data that was collected during the 2005-2009 timeframe. While our theoretical contributions are not bound to a specific time period, a more recent round of data collection may provide a perspective over whether changes in the global and economic landscapes may influence responses. This provides another opportunity for researchers to continue research to better understand the role and connection of marketing activities with respect to development of dynamic capabilities.

Third and finally, our understanding of the nature and characteristics of different types of organizational memory still remain rather preliminary. For this study, we have identified and utilized proxies such as gap in expectations and responses to capture certain elements of organizational memory. More in-depth studies that focus on the nature of organizational memory

and how it is embodied in an organization can provide major contributions to theoretical and practical understanding of the field.

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