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THE RELATIONSHIP AMONG ORGANIZATIONAL SYMBOLS, FIRM ABSORPTIVE CAPACITY, AND PRODUCT INNOVATIVENESS

İPEK KOÇOĞLU
DOCTOR OF PHILOSOPHY THESIS
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GEBZE

2015

GEBZE TEKNİK ÜNİVERSİTESİ	DOKTORA JÜRİ ONAY FORMU

GTÜ Sosyal Bilimler Enstitüsü Yönetim Kurulu'nun 08/06/2015 tarih ve 2015/15 sayılı kararıyla oluşturulan jüri tarafından 17/06/2015 tarihinde tez savunma sınavı yapılan İpek KOÇOĞLU'nun tez çalışması İşletme Anabilim Dalında DOKTORA tezi olarak kabul edilmiştir.

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GTÜ Sosyal Bilimler Enstitüsü Yönetim Kurulu'nun .../.../... tarih ve ..../... sayılı kararı.

İMZA/MÜHÜR

ÖZET

Özümseme kapasitesi kavramının, firma yenilikçiği için kritik başarı faktörlerinden biri olduğu geçmiş çalışmalarca gösterilmiştir. Bu tez, firma özümseme kapasitesinin üç ana araştırma fırsatı çerçevesinde ampirik değerlendirme gerektirdiğini vurgulamaktadır.

İlk olarak, firma özümseme kapasitesi, literatürde çoğunlukla Ar-Ge bağlamında incelenen, somut ve tek boyutlu bir kavram olarak değerlendirilmiştir. Özümseme kapasitesini oluşturan; dışarıdan bilgi aktarımı, benzeştirme, dönüşüm ve kullanım değişkenlerinin firma ürün yenilikçiliği üzerindeki etkisi literatürde nadiren ampirik olarak incelenmiştir. İkincisi, literatürde yenilik tipleri arasındaki ayrıma bağlı olarak, firma özümseme kapasitesi ile özellikle ürün yenilikçiliği arasındaki ilişkiyi inceleyen çalışma nispeten daha az sayıdadır. Üçüncüsü, özümseme kapasitesinin çoğunlukla Ar-Ge temelli bilgiye dayandığı düşünülür. Örgütlerde, ilişkiler ve süreçlere bağlı anlatılan hikâyeler, yaratıcı ve buluşsal benzetmeler ve ortak dil gibi sembollerin, içsel, gizil ve bilinçaltı bilginin tezahürü olarak firma özümseme kapasitesini tetikleyici rolleri incelenmemiştir.

İstanbul Bölgesinde yer alan ve çeşitli sektörlerde faaliyet gösteren 203 firmadan elde edilen anket verilerinin analiz sonuçları; 1) sezgisel (heuristic) benzetme kullanımının, 2) süreçlere dayalı hikâye anlatımının ve 3) ortak dil geliştirmenin, firma özümseme kapasitesi oluşturmayı kolaylaştırdığı ortaya konmuştur. İlişki temelli örgütsel hikâyelerin, firma özümseme kapasitesinin gelişimi üzerinde engelleyici bir etkiye sahip olduğu tespit edilmiştir. Bu tez aynı zamanda, firma özümseme kapasitesinin yeni ürün geliştirme çabalarını pozitif yönde etkilediğini ve örgütsel semboller ile ürün yenilikçiliği arasındaki ilişkide ara değişken etkisine sahip olduğunu göstermiştir. Son olarak, çevresel belirsizliğin ılımlaştırıcı rolü nedeniyle artan belirsizlikte, özümseme kapasitesi ile 1) süreç temelli örgütsel hikâyelerin ∩ şeklinde, 2) ilişki temelli örgütsel hikâyelerin ise U şeklinde bir ilişkisi olmasına neden olmuştur. Çevresel belirsizliğin, sezgisel benzetmeler ve ortak dil ile özümseme kapasitesi arasındaki ilişkide herhangi bir rolü olmadığı tespit edilmiştir.

Anahtar Kelimler: Özümseme kapasitesi, örgütsel semboller, hikâye, benzetme, ortak dil, ürün yenilikçiliği

SUMMARY

Research has shown that the concept of absorptive capacity is one of the critical success factors for firm innovativeness. This thesis emphasizes that absorptive capacity calls for empirical interest through three main avenues.

First, absorptive capacity has been treated as a concrete, uni-dimensional proxy targeting R&D context. The cumulative and simultaneous effect of absorptive capacity variables namely; acquisition, assimilation, transformation, and utilization, on firm product innovativeness were rarely empirically investigated in the literature. Second, relatively few studies distinguished between the types of innovation, particularly focusing on the relationship between absorptive capacity and product innovativeness. Third, absorptive capacity is commonly regarded as relying on R&D based knowledge. The potential role of organizational symbols, such as stories (i.e. process-based stories and relationship-based stories), metaphors (i.e. generative metaphors and heuristic metaphors) and common language, as drivers of absorptive capacity is interestingly missing.

By investigating 203 firms from a variety of industries located in the Istanbul district, we found that; 1) using heuristic metaphors, 2) telling process-related stories, and 3) developing a common language facilitate the development of absorptive capacity in firms. Interestingly, it was found that relationship-based organizational stories diminish the development of absorptive capability of firms. This thesis also demonstrated that absorptive capacity positively impacts the product development efforts of the firms and mediates the relationship between organizational symbols and firm product innovativeness. Finally, by investigating the moderating role of environmental uncertainty, it was revealed that with an increasing level of environmental uncertainty; 1) process-based organizational stories have an ∩-shaped relationship and 2) relationship-based organizational stories have an U-shaped relationship with absorptive capacity. Besides; 3) heuristic metaphors and developing a common language are positively related to absorptive capacity regardless of environmental uncertainty.

Keywords: Absorptive capacity, organizational symbols, stories, metaphors, language, product innovativeness

ACKNOWLEDGEMENTS

I would like to gratefully and sincerely thank to my advisor Prof. Dr. Ali Ekber AKGÜN for his invaluable guidance and devoted intellectual support throughout my graduate studies. Besides his unquestionable academic expertise, his mentorship was paramount in providing me the exploration of new knowledge and devotion to scientific inquiry. I would also like to express my heartfelt thanks to Prof. Dr. Halit KESKİN, the Dean of the Faculty of Management for his invaluable support, constructive feedback and the motivation he has given throughout my graduate studies.

I would like to especially thank to Prof. Dr. Salih Zeki İMAMOĞLU and Prof Dr. Hüseyin İNCE for their support and valuable advice in the completion of my research. I also wish to thank to Prof. Dr. Nihat ERDOĞMUŞ and Prof. Dr. Oya ERDİL for their respected advices and the long lasting support throughout my studies.

During my PhD I have had the pleasure of meeting the most amazing colleagues and life-long friends whom I would like to wholeheartedly thank. Very sincere and warm thanks go to; Büşra MÜCELDİLİ, Şükrü YURTSEVER, Derya DOĞAN, Alev KOÇAK ALAN, Hayat AYAR, Ebru ERDOĞAN for their endless support, patience and friendship along my PhD research. I would like to express my most sincere thanks and appreciation to; Berk GÜLDOĞAN who has supported me in every aspect, technically, psychologically and thoughtfully at heart. I also wish to express my heartfull thanks to the most amazing sister and brother; Naze AVCI and Can AVCI, who have always been by my side with patience and care.

Finally and most importantly, I would like to express my deepest and everlasting thanks for my parents who have shed light to all the roads I walk through. I would like to deeply thank from the bottom of my heart to my mother Yasemin KOÇOĞLU for her unconditional support, generous love and unfailing belief in me. She has always kept me warm and calm, provided me the guidance to truth, and motivation for success. I also would like to express my gratitude and profound thanks to my father Aydın KOÇOĞLU for his endless support, encouragement, care and patience. And my most noble thanks are for my precious and beloved grandmother who has always supported me with love and care.

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LIST OF ABBREVIATIONS

Abbreviations		Description
NPD	:	New Product Development
SEM	:	Structural Equations Modeling
RBV	:	Resource Based View
R&D	:	Research and Development
EFA	:	Exploratory Factor Analysis
CFA	:	Confirmatory Factor Analysis
KMO	:	Kaiser- Meyer-Olkin
CMV	:	Common Method Variance
CFI	:	Comparative Fit Index
IFI	:	Incremental Fit Index
RMSEA	:	Root Mean Square Error of Approximation
df	:	Degrees of Freedom

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1. INTRODUCTION

Contemporary business environment driven by rapid technological advancement, competition at the global level, and quickly changing customer needs and wants, as well as innovative managerial practices have forced organizations to improve their new product development (NPD) endeavors. Thereby firms increasingly devote their effort to increase their product innovativeness (Zahay et al., 2004) which refers to the newness and novelty of new products and services introduced to the market in a timely fashion (Wang and Ahmed, 2004). At this point, researchers, especially influenced by the resource-based view and organizational learning research streams, indicate that firm's existing internal information/knowledge (e.g., R&D and patent intensity) (Cohen and Levinthal, 1989), and the knowledge sources that the firm can create (Pavitt, 1984) are critical for its product innovativeness (Moorman and Miner, 1997; Brockman and Morgan, 2003; Duggan, 2012).

Research have shown that, besides the exploitation of existing knowledge base and sources, the ambiguity, complexity and uncertainty inherent in dynamic business environments force firms to be more responsive to external knowledge (Mu et al., 2010). It is indeed critical to explore new and less commercially focused knowledge from the outside of the firm to stimulate fundamentally NPD success. In addition to the existing internal information/knowledge, researchers also note that firm product innovativeness is closely related to the external information/knowledge (Shu et al., 2005) due to inhibitive role (Ghemawat, 1991; Leonard-Barton, 1992; McDonough, 1993) or insufficient effect (Ritala and Hurmelinna-Laukkanen, 2012) of the internal information/knowledge. Researchers specifically argue that no firm can entirely rely on its own internal knowledge capacity and sources to be more innovative, so therefore it needs to combine inflows and outflows of knowledge through the absorption of new external information/knowledge (Camisón and Forés, 2011; Enkel et al., 2009; Sofka and Grimpe, 2010). The complementary knowledge which is different from firm's existing knowledge base and yet related to it, as to be further integrated to the existing technology, products, processes, skills, strategies and competences increasingly captures the attention of researchers (Zahra and George, 2002; Kostopoulos et al., 2011), because it raises the ability to make effective use

and incorporation of external knowledge which uncovers a multitude of performance benefits (Fabrizio, 2009).

1.1. The Literature Gaps and Contribution of the Thesis

1.1.1. NPD Context: Absorptive Capacity and Product Innovativeness

Firm's absorptive capacity, which refers to the ability to recognize the value of external information/knowledge, assimilate it and apply it to meet new commercial objectives (Cohen, and Levinthal, 1990), becomes a critical success factor for firm innovativeness (Chesbrough, 2003; Stock et al., 2001; Abecassis-Moedas and Mahmoud-Jouini, 2008; Chen et al., 2009; Tranekjer and Knudsen, 2012). Indeed, the literature implicitly emphasizes that absorptive capacity can leverage firms' product innovativeness by making the firm (a) aware of and able to identify new technological trends and knowledge (Nieto and Quevedo, 2005; Pandza and Holt, 2007; Haro-Dominguez et al., 2007), (b) realize the similarities between external knowledge and their existing knowledge base (Abecassis-Moedas and Mahmoud-Jouini, 2008; Lane et al., 2001), and (c) capable of unifying technological knowledge in its outside environment with its internal functions, strategy development, and decision making (Murovec and Prodan, 2009; Müller-Seitz, 2012).

Nevertheless, scholars committed limited effort to empirically investigate the importance of absorptive capacity of firms, particularly on product innovativeness. The growing body of literature on absorptive capacity mainly focuses on firm innovativeness in general as an outcome of absorptive capacity (Cepeda-Carrion et al., 2012; Chen et al., 2009; Jiménez-Barrionuevo et al., 2011; Escribano et al., 2009; Todorova and Durisin, 2007) rather than product innovativeness in particular with the exception of a few studies (Stock et al., 2001; Abecassis-Moedas and Mahmoud-Jouini, 2008; Murovec and Prodan, 2009; Ebers and Maurer, 2014). Yet the relationship between absorptive capacity and product innovativeness is a rather doubtful argument which needs to be clarified (Kostopoulos et al., 2011). Hence, Stock et al. (2001, p. 78) asserts that "A potentially relevant construct that has received comparatively little attention with respect to product development is

absorptive capacity…. the relationship between absorptive capacity and new product development has been explored in a relatively small subset." Further Kostopoulos et al. (2011, p.1335), for instance, wrote that "Research on absorptive capacity outcomes still lacks integrative examinations of innovation. . . while extant work falls short in explaining the interrelationship between them."

Despite the fact that Cohen and Levinthal (1989; 1990) proposed a theoretical framework where absorptive capacity leads to innovative capabilities, and some studies in the literature attempted to explore the relationship between absorptive capacity and firm innovativeness, most of these studies assessed the innovativeness variables as an R&D based outcome. The innovativeness construct mostly comprises either the spending on R&D per volume of sales (Nieto and Quevedo, 2005; Jiménez-Barrionuevo et al., 2011), the percentage of new or improved products per annual sales (Escribano et al., 2009; Fosfuri and Tribó, 2008), or the supportiveness and permeability of the firm to innovation including the encouragement and appraisal of novel ideas, openness to novelty in organizational programmes, and seeking for technical innovations (Cepeda-Carrion et al., 2012) in the NPD literature so far. However, product innovation efforts entail different strategies and have different inputs as well as outcomes (Pavitt, 1984; Martinez-Ros and Labeaga, 2009). For example, according to the study of Pavitt (1984) that indentifies between sources of knowledge inputs (i.e. intra-firm, other firm, public infrastructure) for product and process innovations among different sectors, the product innovation is dependent on the internal knowledge (e.g., R&D and patent intensity) of the firm whereas process innovations are related to the scale and complexity of its process technology (i.e. size of production plant, capital/labor ratio).

1.1.2. The Process-View: Absorptive Capacity as a Multidimensional Construct

Also, in order to understand the relationship between absorptive capacity and firm product innovativeness, the components of absorptive capacity should be clarified. Although past studies agree on the definition and multidimensional nature of the absorptive capacity concept, it was investigated through different dimensions (George at al., 2001; Lane and Lubatkin, 1998; Zahra and George, 2002) and the inter-relations among those dimensions were studied in a linear way. At this point it

would remarkable to elucidate that while absorptive capacity is critical in recognizing the value of external knowledge, firm's internal and path dependent knowledge base could also restrain the firm in leveraging the outside sources of knowledge due to omitting potential differential effects on product innovativeness (Srivastava et al., 2015). Therein Cohen and Levithal (1990, p.133) particularly suggest that "…any particular body of expertise could become sufficiently overlapping and specialized that it impedes the incorporation of outside knowledge and results in the pathology of the not-invented-here (NIH) syndrome." This argument recognizes that the internal stickiness created by specialized knowledge could have varying effects on leveraging knowledge combination, reconfiguration, assimilation, transformation and utilization for NPD. Indeed differential relationships between absorptive capacity dimensions and product innovation are an unsettled debate which needs to be resolved in the NPD literature (Kostopoulos et al., 2011).

Previous studies either investigated the role of one dimension or aspect of absorptive capacity (e.g, acquiring external knowledge) (Murovec and Prodan, 2009; Hulting et al., 2011) on the product innovativeness, or operationalized absorptive capacity as the R&D intensity (Stock et al., 2001) or as a composite variable (Su et al., 2013) in the product innovativeness context. However, as the contemporary management literature indicates, absorptive capacity should not be perceived as a single construct or measure; rather, it should be viewed as a process involving the simultaneous interaction of external knowledge acquisition, assimilation, transformation, and utilization variables (Zahra and George, 2002; Flatten et al., 2011; Jiménez-Barrionuevo et al., 2011; Camisón and Forés, 2010; Todorova and Durisin, 2007). Such that, these variables are iterative in that each factor contributes to the development of the other (i.e., covariance), and the reciprocating interactions among the variables bring absorptive capacity to life. Hence operationalizing absorptive capacity as an R&D based proxy "...is problematic since it treats the concept [absorptive capacity] as a static resource and not as a [dynamic] process or capability" (Lane et al., 2006, p.838). Therefore, ignoring or minimizing, one or more of its components is likely to reduce the real impact of absorptive capacity on product innovativeness, which warrants an empirical investigation. Failure to recognize differing facets of absorptive capacity and their "sui generis" roles could lead to conceptual ambiguities as well as empirical inconstancy.

Consistent with the literature, in this study, we adapt the four dimensions or variables of Zahra and George (2002) including; acquisition which is the firm's ability to identify and acquire externally generated knowledge; assimilation as the analysis, interpretation and internalization of externally obtained knowledge through organizational mechanisms such as routines and processes; transformation as the ability to combine prior knowledge and newly acquired and assimilated knowledge; and utilization as the firm's capability to incorporate the transformed knowledge into its operations in order to enlarge and improve existing competencies to generate new ones. Unlike previous studies, which investigate the sequential relationship among the absorptive capacity dimensions, we also put forward that absorptive capacity is not a single construct or measure; rather it is a process of the dynamic interaction of external information/knowledge acquisition, assimilation, transformation and utilization variables. In a sense, we note that the components of absorptive capacity should be investigated simultaneously adopting a process perspective. Such that these variables are iterative in that each factor contributes to the development of each other, and the reciprocating interactions among the variables bring to life the concept of absorptive capacity.

1.1.3. The Antecedents: Organizational Symbols and Absorptive Capacity

In addition to the consequences of absorptive capacity, from a managerial perspective, the drivers of absorptive capacity should also be empirically investigated in more depth within the NPD context. This will help managers to understand how to improve a firm's absorptive capacity for a successful product development and process implementation effort. While extant work falls short in the exploration of the factors determining absorptive capacity (Huang et al., 2015) and their empirical examination (Murovec and Prodan, 2009), only a few studies address this gap in the literature (Roberts, 2015; Huang et al., 2015; Easterby-Smith et al., 2008; Chou, 2005; Van Den Bosch et al., 2003). For instance, researchers revealed that the; internal research and development (R&D) (Cohen and Levinthal, 1989, 1990; Escribano et al., 2009), training of personnel (Lane et al., 2006), external relationships (which strengthen the knowledge flow) (Todorova and Durisin, 2007), collaboration and attitude towards change (Murovec and Prodan, 2009), resource

commitment and resource flexibility (Chen et al., 2009) or organizational responsiveness (as the opposite of inertia enabling fast adaptation to the changes in the environment) (Lane et al., 2001) etc. are antecedents of a firm's absorptive capacity. Nonetheless the literature neglected the importance of an organization's prior knowledge or experience, which is manifested as organizational symbols[1], being the antecedents (Dandridge et al., 1980; Finkelstein, 2003).

In fact, the roles of organizational symbols on the absorptive capability are specifically unexplored, and there is no systematic framework for their relationship in the literature. While researchers emphasize the benefits of organizational symbols, such as transmitting both technical and expressive meanings of knowledge, serving as information carrying devices among people, enhancing and facilitating the communication and reinforcement processes of external knowledge, and helping people to imagine and interpret their surroundings (Dandridge et al., 1980; Stryker, 1980; Hill and Levenhagen, 1995; Hopkinson, 2003), their role on the absorptive capability is specifically unexplored, and there is no systematic framework to explain their relationship in the NPD literature, as various researchers have noted (e.g., Lemon and Sahota, 2004; Bartel and Garud, 2004; Lounsbury and Glynn, 2001; Goffin and Koners, 2011; Seidel, 2007).

Also, as an organizational symbol refers any "thing" (such as object, event, relationship, behavior, etc.) that conveys meanings (Pratt and Rafaeli, 1997); it should be further clarified for an empirical test. Past research categorized organizational symbols as verbal representations (e.g., myth, story, language, legend, joke), actions (e.g., rituals, routines), and material symbols (e.g., logos) (Dandridge et al., 1980), and does not specifically clarify for an empirical investigation. In this study, we focused on organizational symbols as the verbal forms of symbols within the absorptive capacity and product innovativeness context. Indeed, some researchers in the NPD literature, influenced by psychodynamic view of organizations, have considered organizational symbols, such as language, metaphors (i.e., generative and heuristics metaphors), and stories (i.e., process and relationships related stories), as tools for understanding environmental complexity and uncertainty through a systematic tracking and acquiring of signals (e.g., technological change, trends,

[1] For example, Turner (1968, p. 5) mentioned that symbols "are storehouses of information about the major structural values of a culture" (cf. Finkelstein, 2003). Dandridge et al., (1980) also argue that organizational symbols act as expressions of an organization's and its employees' experiences.

regulations, competition) (Nieto and Quevedo, 2005; Feiereisen et al., 2008; Spithoven et al., 2010; Jespersen, 2012). For example, Zahay et al., (2004) inferred that organizational stories shape the mental models of individuals by structuring the future possibilities and transferring insights and information from external environments. Klein et al., (1998) emphasized that metaphors facilitate the visualization, understanding, and assimilation of external knowledge within the NPD context, thus contributing to new product effectiveness. Kleinsmann et al. (2010) suggested that common language usage improves firms' ability to learn new information from the external environment by creating a shared understanding and driving effective communication in the NPD context.

Besides the clarification of organizational symbols, there is also a lack of research effort in operationalizing them as perceptual measures to minimize bias or misapplication of any number of heuristics in the absorptive capacity context. For example, since (a) organizational stories carry a hegemonic function, selectively highlighting some aspects of organization while marginalizing others (Boje et al., 1999), and (b) most business case studies use a few basic organizational metaphors (e.g., machine, family, sports, music, etc.,) (Liang and Wang, 2004), we need a more unitary measure of them to encompass the organization wide activities.

1.1.4. The Mediation and Moderation: Absorptive Capacity as a Mediator

Furthermore, even though absorptive capacity is credited as mediating a range of phenomena resulting in innovation (Lewin et al., 2011), its mediating role on the relationship between organizational symbols and product innovativeness has not garnered much research effort, as Chen et al., (2009) noted. For example, Lewin et al., (2011) mentioned that absorptive capacity facilitates the transfer/sharing of external knowledge over time as well as its incorporation among organizational functions. Particularly the role played by organizational symbols as the facilitators of learning and generators of knowledge is not addressed in the literature. Only recently some research effort considered the role of stories, metaphors (Goffin and Koners, 2011; Van Den Hende et al., 2012) and common language (Jacobs and Heracleous, 2006) as organizational symbols which generate, communicate, code, express, diversify and comprehend and shape knowledge in general and tacit knowledge in

particular in order to leverage NPD process. The translation of this tacit knowledge, inherent values, complex meaning systems and unconsciously held assumptions within the organizational cognitive schema into product innovativeness is suggested to be driven by the internal capability of firms to effectively recognize, acquire, assimilate, transform and utilize external knowledge. Indeed the internal capability to absorb external knowledge from outside the firm on one side and the internal mechanisms, artifacts or devices which drive the knowledge creation, conveyance and conversion need to be present at the same time for the organizations to achieve product innovations. At this point absorptive capacity has the potential to act as a mediator which connects organizational symbols with the successful new products generation through the internal routines of acquiring, assimilating and utilizing external knowledge (Van Den Hende et al., 2012). Common language, and best practices in the form of stories, regarding innovation efforts, which warrants empirical evidence (Goffin and Koners, 2011).

Finally, as firms are not able to make maximum use of metaphors, stories and common language for absorptive capability due to the unpredictability of the environment, the moderating role of environmental uncertainty between organizational symbols-absorptive capacity links should be empirically investigated. Seidel (2007, p. 531) for example suggests that "In times of greater uncertainty or ambiguity greater emphasis will be placed on working to form a shared grammar, and metaphor can serve a powerful means for translating ideas into new contexts." Therefore, as shown in Figure 1, this study investigates: 1) the role of co-variant absorptive capacity variables (e.g., knowledge acquisition, assimilation, transformation and utilization) on the firm product innovativeness, 2) the impact of co-variant organizational symbols, such as stories, metaphors and common language, on the firm's absorptive capacity, 3) the mediating role of absorptive capacity between organizational symbols and firm product innovativeness, and 4) the moderating role of environmental uncertainty between organizational symbols and firm absorptive capability.

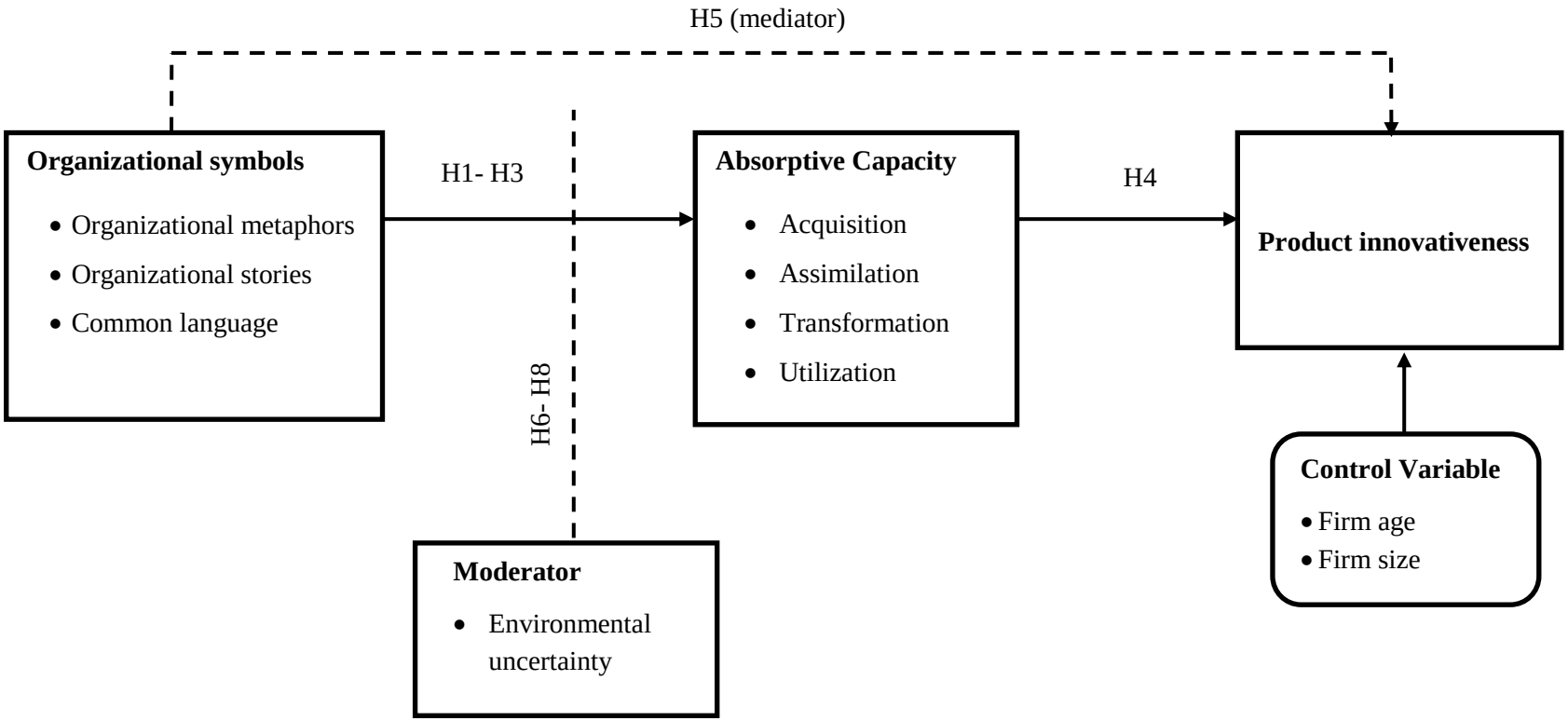

Figure 1.1: Proposed Research Model

2. THEORETICAL FOUNDATIONS

2.1. Absorptive Capacity

"If we take a sponge, its ability to absorb water depends on the number of holes in it, the nature of the material and its resistance to taking in water, as well as the amount of water it currently holds. Once absorbed, the water could flow through the holes in the material. The process of squeezing the sponge could facilitate that flow. These structures and processes allow the sponge to meet its basic purpose. Similarly, an organization could absorb knowledge from the outside, but it will do so only if its knowledge repositories and the brains of its individual members are seeking and receptive to that knowledge based on what they already know. The knowledge flows through the organization, and these knowledge flows can be facilitated by the appropriate structures and processes. Furthermore, these structures and processes can create efficient mechanisms for applying the knowledge to useful purposes"

Roberts et al., (2012, p)

Since the seminal study of Wesley Cohen and Daniel Levinthal in 1989 published in the Economic Journal the concept on absorptive capacity; the ability of organizations to absorb external knowledge, has been referred to as one of the critical learning processes of firms (Lane et al., 2006; Lewin et al., 2011; Todorova and Durisin, 2007; Matusik and Heeley, 2005). Cohen and Levinthal (1989) refined the conventional idea that R&D efforts serve for the generation of new knowledge within the firm. In their pioneering article "Innovation and Learning: The Two Faces of R&D" the authors put forward the idea that R&D not only generates new knowledge but also leverages firms ability to identify, assimilate and exploit externally generated knowledge. This ability of firms to incorporate and utilize external knowledge is reflected as leading firms to innovate through exercising a sort of learning which differs from learning-by-doing. In contrast to learning-by-doing which is an automatic process of gaining practice and experience based knowledge, absorptive capacity refers to the acquisition of outside knowledge which allows the firm to generate something substantially new (Cohen and Levinthal, 1989). The idea

that firms rely on absorptive capacity in order to exploit outside knowledge which is particularly of a more scientific nature yet not necessarily ready to be used such as the imitation of a new product or process, made it a critical concept from a managerial as well as an academic standpoint. Cohen and Levinthal in a later study approached the firm as an innovating unit which relies on its ability to exploit external knowledge.

Cohen and Levinthal (1990) extends the previous conceptualization of absorptive capacity and suggest that absorptive capacity indicates the collective abilities of firms to recognize the value of outside knowledge, assimilate and apply it for commercial purposes. Therein, firms rely on their prior knowledge in order to benefit from new and external knowledge. Absorptive capacity relies on individual capacities and abilities, in addition to the organizational ability to transfer knowledge across organizational boundaries and between organizational units. A higher level of absorptive capacity enables the firm to be more attentive and prone to outside knowledge and its recognition for further utilization in critical operations, leading firms to be more proactive and committed to innovation (Jiménez et al., 2012).

Firms require some knowledge overlap with an external knowledge source to successfully absorb new knowledge from the external environment (Lichtenthaler, 2009). The authors in this second research highlight that the ability to absorb new knowledge not only resides in the prior knowledge generated by the R&D processes but also of the other cognitive aspects of learning. Particularly it is suggested that absorptive capacity can be an outcome of; (1) the breadth and depth of prior knowledge stored in the organizational memory, (2) the linkages between prior conceptions within organizational memory, (3) prior knowledge for learning, (4) problem-solving techniques and heuristics, (5) intensity of time and effort spent for early problem-solving, and (6) richness of existing knowledge structures (Cohen and Levinthal, 1990).

Since these influential studies leading to the emergence of the absorptive capacity concept, the construct has attracted considerable attention in the literature from a variety of perspectives. The high pace of development in the absorptive capacity literature is accredited to its exclusive approach as well as its resemblance to other perspectives within organizational research such as; organizational learning, strategic alliances, inter-organizational networks, knowledge management, dynamic capabilities and resource-based view (Lane et al., 2006; Lewin et al., 2011; Volberda

et al., 2010). Numerous theoretical and empirical studies revealed the significance of this particular construct and analyzed its impact in a variety of research domains such as; innovation management, strategic management, organizational learning, manufacturing organizations, information systems, intra-organizational networks, international joint ventures and multinational enterprises, research intensive firms and service industries (Amara et al., 2008; Cepeda-Carrion et al., 2012; Kostopoulos, 2011; Gebauer et al., 2012; Lane et al., 2001; Tu et al., 2006; Mu et al., 2010; Roberts et al., 2012; Lane et al., 2001; Hotho et al., 2012; Minbaeva et al., 2003; Patterson and Ambrosini, 2015; Chang et al., 2014).

Research on this multidisciplinary construct is derived from a variety of theories including; organizational learning, innovation, managerial cognition, reosurce-based theory of the firm, knowledge-based view, dynamic capabilities and co-evolutionary theories (Volberda et al., 2010). Prior literature includes many studies investigating the nature and dimensions (Cohen and Levinthal, 1989, 1990; Lane and Lubatkin, 1998; Zahra and George, 2002), measurement and validation (Jiménez-Barrionuevo et al., 2011; Flatten et al., 2011), antecedents (Roberts, 2015; Camisón and Forés, 2011, Harrington and Guimaraes, 2005; Murovec and Prodan, 2009) and the consequences of absorptive capacity (Haro-Dominguez et al., 2007; Kostopoulos et al., 2011; Nieto and Quevedo, 2005; Tu et al., 2006). Due to the flexible nature of absorptive capacity many studies approach absorptive capacity at different levels: individual (Cohen and Levinthal, 1990), intra-organizational (Szulanski, 1996), organizational (Cohen and Levinthal, 1990; Schmidt, 2010;), learning dyad (Lane and Lubatkin; 1998), intra-district (Boari and Lipparini, 1999; Camisón and Forés, forthcoming) and inter-alliance (George et al., 2001; Lee et al., 2010; Mowery et al., 1996).

Although the absorptive capacity literature has expanded rapidly and diffused to many organizational research domains, it has been rejuvenated through various reconceptualizations and refined models, researchers doubt about the exploitation of the concept to its full potential (Volberda et al., 2010). It is consistently highlighted that certain important gaps still persist and need to be scrutinized. Particularly the definition and operationalization of absorptive capacity requires in-depth analysis and reflexive questioning based on its scope (Camisón and Forés, 2010). Limited empirical work regarding its measurement and validation highlights the need for examining how absorptive capacity of organizations emanate from lower level

actions or knowledge accumulations of organizational actors and how it emerges as a multi-faceted construct consisting of differential effects on various organizational outcomes (Ebers and Maurer, 2014).

2.1.1. The Definition of Absorptive Capacity

Absorptive capacity first implicitly proposed by Adler (1965), appeared as a macroeconomic concept defining the ability of the economy to utilize and absorb external information and resources (cf. Tu et al., 2006). However, due to its multidisciplinary nature, the use absorptive capacity has not been limited to economy perspective and expanded throughout many fields of research such as organizational learning, industrial economics, resource based view, and dynamic capabilities (Schmidt, 2010; Zahra and George, 2002). Hence, Cohen and Levinthal (1989) first came up with the absorptive capacity at the firm level, originating from the economists' debate that presents R&D efforts as generating solely internal knowledge.

The leading-edge research by Cohen and Levinthal (1989) suggested that R&D not only generates new information but improves firm's ability to identify, assimilate and exploit existing information from the environment and they referred to it a firm's learning capacity or *absorptive capacity*. The study, particularly focused on technological knowledge and the dual role of R&D as the generator of new knowledge and absorptive capacity. Cohen and Levinthal (1990) in their later study revised the initial definition of absorptive capacity as the ability to recognize the value, assimilate and apply new, external knowledge to commercial ends and diversified individual and organizational absorptive capacities. This research, extending its roots to the cognitive aspects of learning process, implies that prior knowledge and diversity of expertise through organization's individual members are essential in valuing, assimilating and applying the new knowledge within the organization. Hence they conceptualized absorptive capacity as "... an ability to recognize the value of new information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal, 1990, p. 128). The definition proposed here highlights three capabilities namely; the *recognition of value*, *assimilation* and *application of external knowledge* which constitute the three components of absorptive capacity (Van Den Bosch et al., 2003) as shown in Figure 2.1.

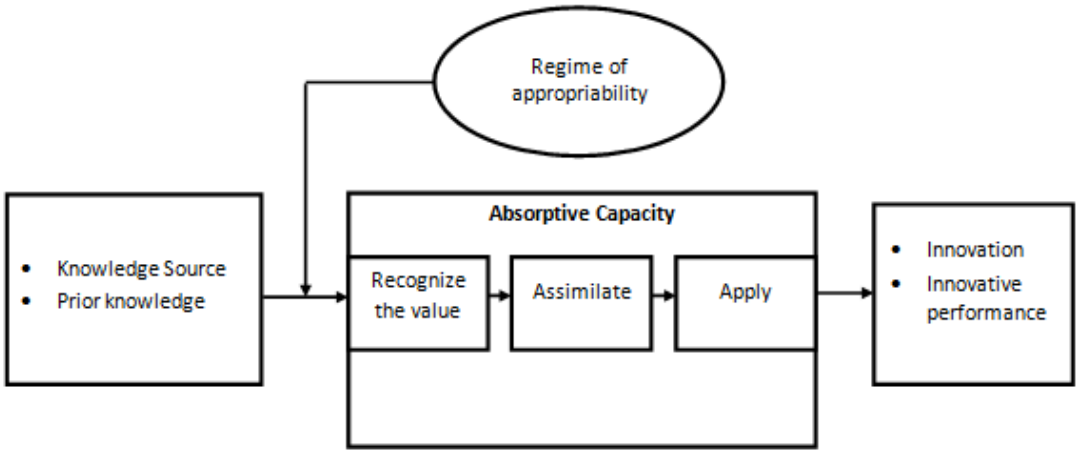

Figure 2.1: A Model of Absorptive Capacity based on Cohen and Levinthal (1990)

The approach brought forth by Cohen and Levinthal (1990) located absorptive capacity as an integral concept in the literature and laid the groundwork for theoretical developments over the subsequent 25 years (Volberda et al., 2010). Given the core idea of the absorptive capacity concept tapping into the roots of its emergence, it's inevitable to underline that the concept have continuously been elaborated, redefined and reconceptualized along the literature since its introduction. Subsequent research have revised and extended its definition as well as components inducing the concept itself. However only slight differences have been suggested regarding the redefinitions of absorptive capacity mainly emerging from the original conceptualization of Cohen and Levinthal's hence without questioning the inherited concept (Ebers and Maurer, 2014; Camisón and Forés, 2010).

Following Cohen and Levinthal (1989, 1990) research has almost exclusively investigated the absorptive capacity concept in the R&D context. Parallel to this wave of reluctance to interfere with the emergent consistency regarding the new stream of research, many researchers relied on the definition of the construct from an R&D based view. Mowery and Oxley (1995) in an attempt to incorporate the tacit component of knowledge within the absorptive capacity defined the concept as the skills required in order to deal with the tacit component of the externally acquired knowledge. The research stresses the importance of the need to codify and reorganize the transferred knowledge in order to utilize it within organizational practices and the

commercialization of potential knowledge assimilated from the outside. Mowery and Oxley's (1995) study presents human capital explicitly; the skills, training and degree of education of the R&D personnel and R&D spending as the indicators of absorptive capacity.

Novelties in definition of absorptive capacities mostly originated from researchers which aimed to root absorptive capacity in fields such as organizational learning, knowledge management or dynamic capabilities view (Volberda et al., 2010). For instance, Lane and Lubatkin (1998) focused absorptive capacity in a relational basis from an inter-firm knowledge exchange setting. They distinguish between the student and the teacher firm. According to their approach "..absorptive capacity, its ability to value, assimilate, and apply new knowledge from a learning alliance partner.." (Lane and Lubatkin, 1998). Here, absorptive capacity of firms depend upon: (1) the specific type of new knowledge base exhibited by teacher firm; (2) the compatibility between the student and the teacher firm's compensation practices and organizational structures; and (3) the dominant logics involved which enables the student firm to be familiar with the teacher firm's problem settings.

Absorptive capacity is also conceptualized in specific settings such as service or manufacturing or information technologies. Based on a manufacturing context Tu et al., (2006, p.694) define absorptive capacity as "… the organizational mechanisms that help to identify, communicate, and assimilate relevant external and internal knowledge". Their research aims to show that manufacturing firms having higher absorptive capacity are more inclined to sucees in implementing new manufacturing practices because they have related knowledge, experiences and effective communications infrastructure. On the other hand from a service setting Koch and Strotmann (2008) examine absorptive capacity in a knowledge intensive business services (KIBS) sector. They define absorptive capacity as "…the ability to identify, assimilate, and exploit knowledge from the environment, for firm innovation…can be regarded as the ability of a firm to link the external stock of knowledge (technological opportunities) and the in-house capabilities in order to develop new and improved products" (Koch and Strotmann, 2008, p. 515).

Moreover a recent evaluation of absorptive capacity comparing and contrasting it within manufacturing and service enterprises' context highlights that absorptive capacity is predominantly considered critical in the manufacturing sectors but not as much important in service sector. However the critical outcome of absorptive

capacity; innovativeness, depends on technological speed, breadth and depth in the manufacturing sector (Zahra et al., 2000), whereas the innovativeness in the service sector is dependent on the speed, breadth and depth of knowledge generation (Chang et al., 2014). Indeed the results of the research reveal that service enterprises cultivate higher absorptive capacity and convert novelty into success. Hence absorptive capacity within service industry context requires as much attention as in manufacturing industry context. Accordingly, Chang et al., (2014, p. 469) define absorptive capacity as "…a set of organizational capability that can be applied by companies to acquire, assimilate, transform, and exploit knowledge to produce organizational capabilities". Even higher accentuation on service-dominant logic is made through the establishment of a concept namely service absorptive capacity which is defined as "…the firm's ability to identify and recognize knowledge and relationships within the extended context, make sense of them, embed them in the organization's value systems, and translate them into a value proposition" (Jiménez et al., 2012, p. 158).

Given the above definitions of absorptive capacity, it should be stated that radically differing definitions which are embodied through reconceptualizations, refinements and rejuvenations of the absorptive capacity concept are rare. Nevertheless, a few researchers leaded the reconceptualization of absorptive capacity as well as its definition and associated dimensions such as Lane and Lubatkin (1998), Szulanski (1996), Zahra and George (2002), Lane et al. (2006), Todorova and Durisin (2007), Lichtenthaler (2009), Camisón and Forés (2010), Cepeda-Carrion et al. (2012) and Lewin et al., (2011) contributed to the development, richness and evolution of absorptive capacity literature as well as the concept itself. The next part returns the attention to the various reconceptualizations of absorptive capacity.

2.2. The Reconceptualizations of Absorptive Capacity

2.2.1. Relational View of Absorptive Capacity

One of the first attempts to redefine absorptive capacity is Lane and Lubatkin's (1998) study which regards the concept from an inter-organizational context. The authors introduce a new term coined as *relative absorptive capacity*. The main difference of relative absorptive capacity from its original ancestor is that it

acknowledges various levels of absorptive capacity and its relativity. The authors shift the unit of analysis from organizational level to the pairs of organizations (i.e. student and teacher firms) and define relative absorptive capacity as "the ability of a firm to learn from another firm which is jointly determined by the relative characteristics of the student firm and the teacher firm". According to this view conscious and deliberate management activity is not sufficient to establish inter-organizational learning, rather firms need to recognize and value new external knowledge, assimilate it and utilize it for commercial ends (Lane and Lubatkin, 1998).

Among the fundamental attempts to move absorptive capacity construct away from the original conceptualization is proposing a *relational view of absorptive capacity.* First Szulanski (1996) examined absorptive capacity within a unit level (i.e. department) to show that the absorption of knowledge is dependent on the motivation and causal ambiguity of the knowledge transferred between units. Dyer and Singh (1998) expanded this relational view and suggested that absorptive capacity of firms is based on social interactions, collaboration and individual relationships. Hence in this perspective absorptive capacity is seen as an iterative process of relational exchange, in contrast to the conventional understanding of absorptive capacity proposed by Cohen and Levinthal (1990) as one-directional learning. Similarly Lane et al., (2001) focus on joint learning assumes that the transfer of knowledge between the “knowledge absorbing partners” does not insist upon overlapping knowledge bases. These redefinitions of absorptive capacity to include different perspectives were each worthy insights within the field however did not manage to integrate and form a reconceptualization (Murovec and Prodan, 2009).

Furthermore, studies elaborating different conceptualizations and operationalizations of absorptive capacity are ambiguous, such that; these studies don't clarify why these different conceptualizations or dimensions are needed nor how they differ from each other. Hence one of the highly adopted reconceptualizations of absorptive capacity is developed by Zahra and George (2002). The authors inquire "what drives performance differences within the same industry?" which is central in the understanding of a firm's absorptive capacity. Zahra and George (2002) grounds the absorptive capacity construct in the dynamic capabilities literature and underlines that absorptive capacity as a firm's dynamic capability enable the firms to reconfigure its resource base, adapt to dynamic market

conditions and achieve competitive advantage. Accordingly absorptive capacity is defined as "...a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability" (Zahra and George, 2002, p. 186).

The four capabilities mentioned in the definition namely; acquisition, assimilation, transformation and exploitation constitute the dimensions of absorptive capacity which according to Zahra and George (2002) display differential but complementary roles in achieving various organizational outcomes. Hence this research reformulates absorptive capacity as a four-dimensional model, instead of the traditional three-dimensional model of absorptive capacity. Moreover, it posits that these four dimensions establish the two subsets of absorptive capacity explicitly; potential absorptive capacity and realized absorptive capacity. The first two dimensions of acquisition and assimilation represent the potential absorptive capacity whereas the last two; transformation and exploitation build up to form realized absorptive capacity.

Zahra and George (2002) makes an insightful exploration to present how the four dimensions of absorptive capacity build upon each other and make absorptive capacity an integrative dynamic capability that cultivates innovative organizational outcomes. Accordingly they propose that realized absorptive capacity and potential absorptive capacity relate to each other through a ratio specified as *efficiency factor* which is translated as the extent to which firms are able to create value from their potential knowledge base through transforming and exploiting the acquired and assimilated external knowledge. Particularly, if the realized absorptive capacity of firms is high then the degree of value creation from the absorbed knowledge through the existing knowledge base is fostered resulting in performance increase.

Additionally, the proposed model of absorptive capacity consisting of four components recurrently building into two subsets namely realized and potential absorptive capacities, incorporate the role of three dynamics which respectively influence (1) the emergence/development of firm’s absorptive capacity, (2) the establishment of a shared understanding and integration of externally absorbed knowledge leading to its exploitation and (3) the achievement of competitive advantage. These dynamics are orderly named as; (i) activation triggers, (ii) social integration mechanisms, and (iii) regimes of appropriability. This framework is shown in Figure 2.2.

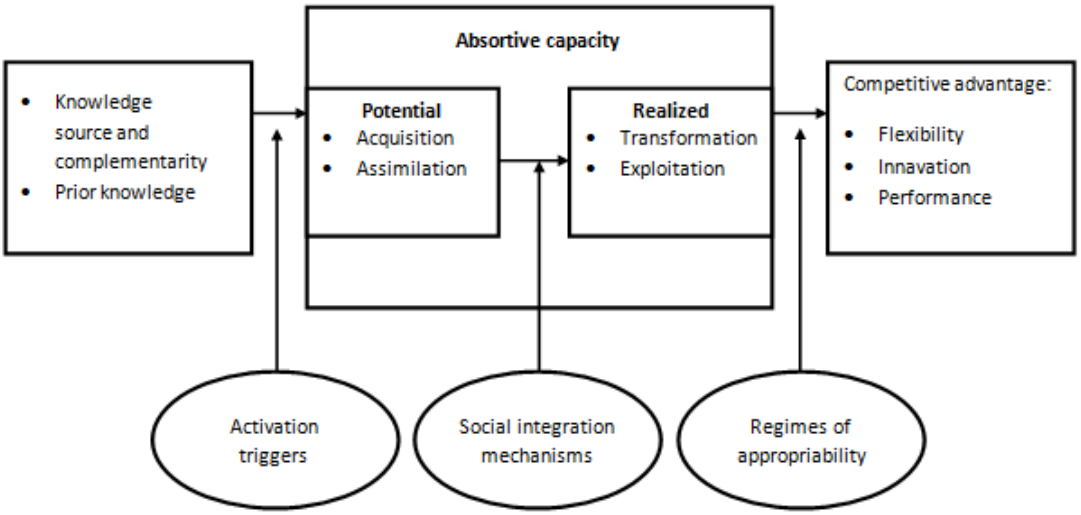

Figure 2.2: A model of Absorptive Capacity Based on Zahra and George (2002)

*Activation trigger*s are presented as influencing the responses a firm gives to external stimuli, such that enabling the firms to achieve intensified learning skills and efforts. For instance crises, due to their dangerous and threatening nature stimulate firms to explore, acquire and internalize external knowledge. Activation triggers can be internal or external and manifested in varying intensities. As the intensity of the trigger increases the likelihood of organizations to allocate resources for the assimilation and exploitation of outside knowledge rises (Zahra and George, 2002).

Social integration mechanisms, enhances the exploitation of knowledge acquired and assimilated into the firm through enabling the effective sharing and integration of knowledge. These mechanisms can be embodied through formal ways such as rules, policies, coordinators, and informal ways such as social networks and collaborations. Therefore firms need to boost intra-firm connectedness through investing in structures establishing employee interaction, creative action and flow of information (Zahra and George, 2002).

Lastly regimes of appropriability, are expressed through institutional and industry dynamics enable firms to protect the benefits gained through new products and processes in the competitive market. Strong regimes of approprability warrant the protection of firm's knowledge assets hence translating into greater returns from absorptive capacity and particularly realized absorptive capacity. On the contrary in weak regimes of appropriability the protection of firms' intangible assets is more

difficult. In weak regimes of appropriability, the presence of isolating mechanisms that prevent the imitation of firms resources, products and capabilities allow firms to sustain their competitive advantage (Zahra and George, 2002).

This reconceptualization enables the researchers to refine the model incorporating the different components, antecedents and consequences of absorptive capacity. The potential absorptive capacity enables the firm to be receptive to the outside knowledge, explicitly to identify the degree of value associated in relation to the firm's existing range of activities, products, processes and technologies. Whereas, realized absorptive capacity serves to leverage the knowledge absorbed through transformation and utilization, particularly leading to commercialization of absorbed knowledge, profit generation and increased firm performance (Zahra and George, 2002).

2.2.2. The Process-based View of Absorptive Capacity

The reconceptualization of Zahra and George (2002) has been influential in initiating the process-based view of absorptive capacity where routines and dynamic capabilities are addressed in the conceptualization of the construct. Although initially Cohen and Levinthal (1990) implicitly conceded that absorptive capacity is a capability (i.e. dynamic process) their use of the concept as an equivalent of R&D activity or spending indicates an inconsistency. Abandoning the narrow focus on the absorptive capacity as an outcome of R&D, research initiated to explore the process behind the establishment of a firm’s absorptive capacity by tapping into its micro-foundations (Volberda et al., 2010; Massini, 2010; Lewin et al., 2011). It has been acknowledged in that conceptualizing absorptive capacity as corresponding to the R&D knowledge regards it as an asset rather than a capability and ignores the dynamic nature of the construct encompassing a series of complementary processes (Robert et al., 2012). Pursuing the process-view of absorptive capacity also illustrated as the capability-view researchers attempted to reconceptualize, establish direct measures and empirically validate the construct.

It would be timely to explain the two contrasting perspectives in the resource based view (RBV) of the firm which establishes the basis to distinguish between asset-based view of absorptive capacity (i.e. traditional R&D context focus) and process-based view also interpreted as the dynamic capability-based view of

absorptive capacity. RBV explains the competitive advantage of firms through the resources firm posses which cannot be mobilized nor homogeneously distributed across sectors (Barney and Clark, 2007). The RBV is characterized by two approach namely; the structural and the process based RBV. The former, explicitly asset-based view; suggests that firms rely on their valuable, rare, inimitable and non-substitutable (VRIN) resources in order to achieve sustained competitive advantage. This approach assumes that resources are heterogeneous and perfectly immobile across the firms, therefore firms compete on the basis of scarce resources and trying to prevent their competitors to imitate or acquire theirs. In the latter approach namely process-based view; the acquisition and ownership of resources are less emphasized because it assumes that sustained competitive advantage depends on the processes and implications o how these resources are utilized within the firm. Indeed it is not enough for firms to have VRIN resources rather in order to gain competitive advantage they need to combine those resources with the existing resources to develop new competencies and knowledge.

The RBV helps to make inferences on how firms develop absorptive capacity, how absorptive capacity leverages firm outcomes and how the firm's capabilities are reconfigured to establish absorptive capacity for firms. The traditional approaches to absorptive capacity regard the construct from an asset-based RBV, notably describing it as the means by which firms acquire and incorporate the knowledge generated by its competitors. The competitors' knowledge resources are transferred through the capability of absorption. Nevertheless researchers suggest that this approach of asset-based RBV constrain the absorptive capacity field (Ebers and Maurer, 2014). The focus on R&D based knowledge thus is criticized to ignore the essential roles played by absorptive capacity processes in creating new knowledge, assimilating, integrating and utilizing it for creating value among the competitors. For instance, firms rely not only in their resources but on the processes to leverage those resources according to the process-based view of RBV and coextending in absorptive capacity (Lane et al., 2006).

2.2.3. Towards a Reification of Absorptive Capacity

Lane et al., (2006) grounding their research on the danger of "reification" of absorptive capacity explains how the construct became objectified and detached from

human construction. According to the authors the absorptive capacity concept has become reified which means that the outcome of a human activity becomes objectified to mean and serve something other than its purpose (Berger and Luckmann, 1966). Indeed particularly exogenous entities such as absorptive capacity becomes detached from what it originally intended to represent. The potential of reification of absorptive capacity urged researchers to become attentive the concerns associated with its validity. Indeed Lane et al., (2006) called attention to the increasing failure to specify the assumptions guiding the establishment and the development of the construct. Particularly the failure to stick to a common basis increases the likelihood of reification. Lane et al.'s (2006) research constitutes one of the groundbreaking refinements on the antecedents and consequences of absorptive capacity model.

The reification results in surface definitions, inherited conceptualizations and functional fixedness regarding the concept. Indeed Lane et al. (2006) aims at exploring this problematic, critically examines the stifling of research in the absorptive capacity domain and develops an extended model of absorptive capacity including its processes, antecedents and consequences. The authors define absorptive capacity as a firm’s ability to utilize external knowledge through sequentially; recognizing and understanding of potential external knowledge, the assimilation of the new knowledge through transformation and exploitation of the assimilated knowledge which is integrated within firm’s structures, processes and routines, for commercial outputs.

In their attempt to rejuvenate the construct Lane et al. (2006) identified 289 articles in total that make substantial use of the absorptive capacity construct and cite the study of Cohen and Levinthal (1990) from July 1991 and June 2002. The 14 journals where these articles are published range from *Strategic Management Journal* to *Human Relations* as shown in Table 2.1. The aim of this thematic analysis is to explore the range of domains where absorptive capacity is used and identify its predominantly anticipated antecedents and consequences. Particularly this research differentiates from other reviews of absorptive capacity by proposing to test for the degree of reification, discover the causes and consequences of the reification and suggest some solutions for its elimination in future studies. The content analysis executed through the 289 articles reveals that %35 of articles remain silent regarding the detailed discussions of the pioneering Cohen and Levinthal (1990) research, %40

of the articles do not confer absorptive capacity as a process-based construct referring to the dynamic capability of a firm. Thus far %80 of the literature consists of the traditional view of absorptive capacity in an R&D context, identified and indicated with R&D based proxies (Huang et al., 2015). Hence although studies highly cite the original research on absorptive capacity as it emerges as a critical construct, these citations do not perceive the true meaning and potential of it (Lane et al., 2006).

Table 2.1: Publications on Absorptive Capacity Citing Cohen and Levinthal (1990)

Journal	Number of Publications
Strategic Management Journal	66
Research Policy	34
Organization Science	31
Academy of Management Journal	26
Academy of Management Review	24
Management Science	18
Journal of Management Studies	13
Organization Studies	12
Journal of International Business Studies	12
California Management Review	12
Journal of Management	9
Journal of Business Venturing	8
Administrative Science Quarterly	7
Human Relations	5
Total	289

Moreover as a result of the content analysis Lane et al. (2006) the authors reveal five key assumptions driving the existing research base regarding absorptive capacity leading to its reification. These are;

1. Absorptive capacity is relevant only to R&D related contexts.
2. Firms develop absorptive capacity when they realize the existence of or encountered with valuable external knowledge.

3. Relevant prior knowledge is considered as equivalent to the absorptive capacity of firms.
4. A firm's competitive advantage is based on the scarcity of the firm's knowledge resources.

Lane et al. (2006) through their identification of the reasons and consequences of absorptive capacity also originates further research effort through highlighting three major shortcomings of the existing literature on absorptive capacity. First, few researchers have attempted to revise the definition of absorptive capacity. Second, little attention has been given to the processes underlying absorptive capacity. And third, it has almost exclusively been measured in the context of R&D.

Consequently Lane et al. (2006, p. 856) offer a new definition to absorptive capacity as "...a firm's ability to utilize externally held knowledge through three sequential processes: (1) recognizing and understanding potentially valuable new knowledge outside the firm through exploratory learning, (2) assimilating valuable new knowledge through transformative learning, and (3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning." Furthermore specifies a more comprehensive model of absorptive capacity its drivers and outcomes as shown in Figure 2.3.

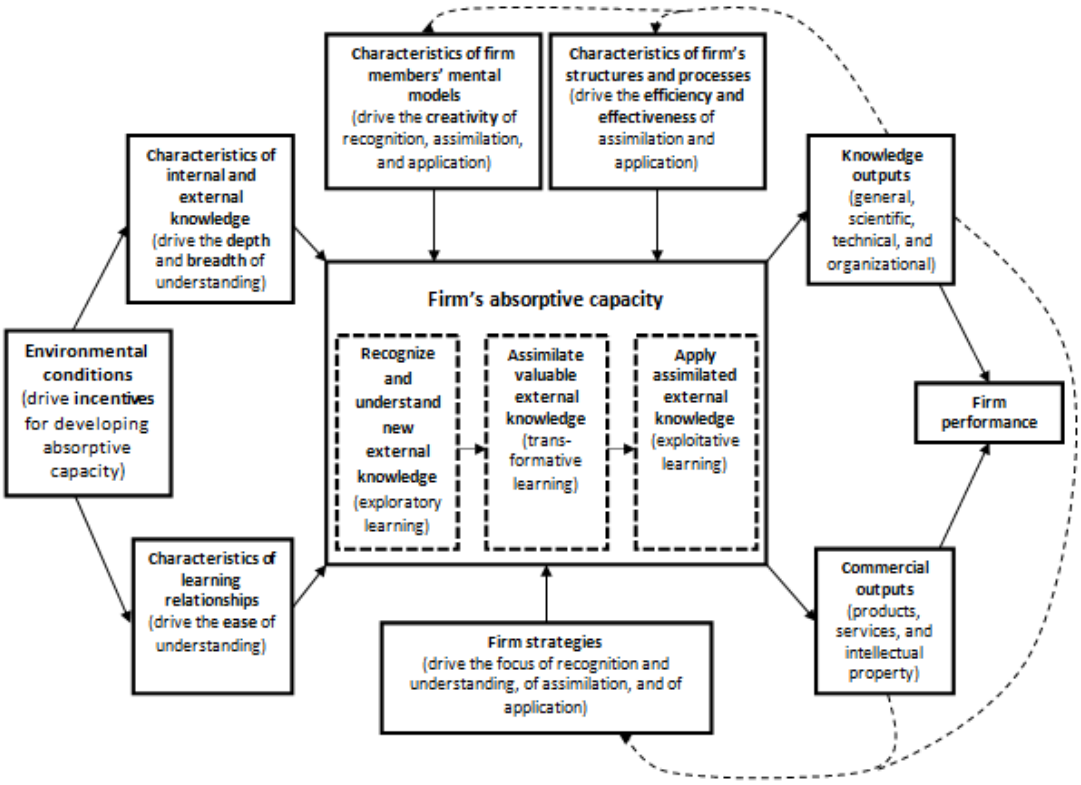

Figure 2.3: A Process Model of Absorptive Capacity, Its Antecedents and Its Outcomes Based on Lane et al. (2006)

2.2.4. Refined Model of Todorova and Durisin

In a rather critical research Todorova and Durisin (2007) address the gaps and ambiguities in Zahra and George's (2002) model offering substantive changes based on empirical research. Particularly they examine the components of absorptive capacity based on existing empirical studies and subsequently reintroduce "recognizing the value" aspect originally articulated in Cohen and Levinthal's (1990) conceptualization. Todorova nd Durisin (2007) based on the learning theories inquires whether the Zahra and George's (2002) new component namely knowledge transformation constitutes a sequential stage following the knowledge assimilation. They argue that knowledge assimilation and knowledge transformation are not different sequential stages of absorptive capacity but knowledge transformation is an alternative process related to assimilation. There are multiple linkages between the two. Thus absorptive capacity is defined as the firm's capability to recognize the value, acquire, assimilate or transform and exploit external knowledge. Assimilation and transformation play interchangeable parts in this process.

When the external knowledge the firm encounters suites the cognitive frameworks within the firm, assimilation of that knowledge occurs which without any interruption or any need to transform serves for its exploitation. However if the external knowledge does not conform to the knowledge framework within the firm it needs to be transformed in order to be utilized (Todorova and Durisin, 2007). In this sense, also the boundaries between the two subcomponents of absorptive capacity blur such that the transition mechanisms coined as the contingency factor, more explicitly social integration mechanisms between assimilation and transformation extends to influence all of the four absorptive capacity constructs. The reconceptualization of Todorova and Durisin, (2007) is shown in figure 2.5.

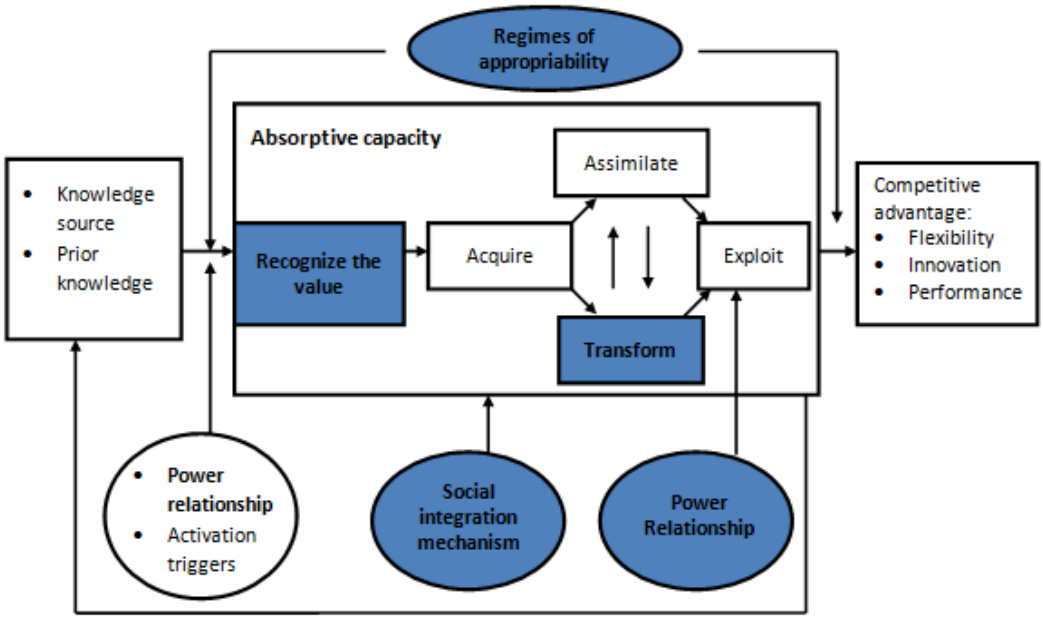

Figure 2.4: A Refined Model of AC Based on Todorova and Durisin (2007)

Todorova and Durisin (2007) base their research on cognitive science in individual learning to propose that assimilation and transformation are two alternative processes. Transformation enables organizations grasp the unfamiliar situations and ideas which are perceived as inconsistent with the existing frames of reference. Indeed transformation process underlines how organizations change their existing ways of knowing and learning to acquire and utilize new knowledge which seems to be incompatible with the existing stock of knowledge and associated structures (Todorova and Durisin, 2007). Nevertheless, the research acknowledges that according to cognitive bases of individual level learning assimilation and

transformation are not sequential but alternative processes. It is argued that these processes comprise of the accommodation of the external knowledge in order for it to be incorporated into the firm's existing knowledge base. Therein, if the extramural knowledge requires no adaptation and can be readily consolidated to the firm's knowledge structures it is directly assimilated.

Based on the explanation of Zahra and George (2002) describing assimilation as the process of comprehending and interpreting the knowledge to be absorbed from the outside through the existing cognitive configurations, Todorova and Durisin (2007) emphasizes that is the new knowledge fits the firm's existing frames there will be no neccessity to transform; explicitly change existing knowledge schemata. On the contrary if the new knowledge extraneous to the firm is irreconcilable to the existing knowledge schema, it cannot be readily accommodated hence the cognitive structures of the organizational members are modified instead, since the comprehension and interpretation of the radically new knowledge is not possible. This process of modifying existing cognitive schemes, frames of reference and learning routines is referred to as the transformation capability within absorptive capacity of firms.

The improvement of the absorptive capacity model proposed by Todorova and Durisin (2007) also encloses regimes of appropriability (also included in the original reconceptualization of Zahra and George, 2002) at both ends of the absorptive capacity model rather than at one end. Furthermore, Todorova and Durisin (2007) involve power relationships to adress that recognizing the value of external knowledge is dependent on along with activation triggers. They also incorporate the feedback loops to captivate the dynamic aspects of the process in addition to social integration mechanisms for the functioning of the reciprocal interactions between the absorptive capacity aspects.

2.2.5. Recent Reconceptualizations of Absorptive Capacity

In a more recent study Lichtenthaler (2009) drawing on the process-based view, aims to explore the interactions between different processes of absorptive capacity in order to empirically show their complementarities in influencing innovation and performance outcomes. In this context absorptive capacity is defined as "...a firm's ability to utilize external knowledge through the sequential processes of

exploratory, transformative and exploitative learning. Accordingly absorptive capacity is a dynamic learning process rather than a static asset (Gebauer et al., 2012). The research consistent with the literature on organizational learning and search behavior mainly focuses on the dynamic capabilities perspective where absorptive capacity relies on the firm's prior knowledge stock which constitutes the basis for knowledge interactions between the three learning processes. Exploratory, transformative and exploitative learning processes complementarily contribute to increase the knowledge flows between the firms. The different levels of absorptive capacity particularly bring to light how absorptive capacity comes into existence as a collection of these distinctive but complementary learning processes.

Exploratory learning processes refer to the recognition of external knowledge sources and their acquisition. In order for firms to acquire the external knowledge two important stages are necessary in particular; recognition of the sources of knowledge through scanning mechanisms and assimilation through integration to the existing knowledge structures. *Transformative learning processes* are defined as the retention, and reactivation of assimilated knowledge for the internalization of the knowledge to be utilized at the next stage. Transformative learning processes are strengthened through prior market and technological knowledge since they explicate the path-dependencies within the firm. At last, the *exploitative learning processes* emphasize the exploitation stage of knowledge. It refers to the transmuting of the assimilated knowledge and application of it for the particular product or process contexts. Greater market knowledge enhances the ability of firms to successfully exploit knowledge since it generates some familiarity with the market, products and processes (Lichtenthaler, 2009). Seemingly, the three learning processes have distinctive but complementary roles in enhancing absorptive capacity.

Camisón and Forés (2010) with the purpose to extend and empirically validate the theoretical conceptualization of Zahra and George (2002), offers a rigorous empirical validation of the absorptive capacity measurement scales. The study applies confirmatory factor analysis using structural equations modeling (SEM). In the model empirically validated by Camisón and Forés (2010, p. 709) absorptive capacity is defined as "... the systematic, dynamic capacity that exists as two subsets of potential and realized absorptive capacities. " Potential absorptive capacity captures the organization's efforts in recognizing the value, acquiring and assimilating external knowledge. Besides, realized absorptive capacity underlies

organization's ability to integrate, adapt and accommodate the newly acquired knowledge and the existing knowledge structures.

Another reconceptualization of absorptive capacity emerges from the argument that knowledge may have a relatively limited time of retention at the individual level due to employee mobility. Therefore, in order for external knowledge to be utilized for commercial purposes the firm needs to secure the knowledge acquired through indispensible internal mechanisms and facilitate its storage and retrieval for nourishing innovativeness. Cepeda-Carrion et al., (2012, p. 110) define absorptive capacity as " the quality which enables knowledge to be converted into new products, services or processes to support innovation", further highlights that “absorptive capacity can be conceptualized as a set of organizational abilities for managing amd assimilating knowledge and applying it to commercial ends” (Cepeda-Carrion et al., 2012, p. 111) Indeed, this research proposes that some balance has to be kept between potential and realized absorptive capacities since the two require very different strategies and structures.

Firms need to generate an organizational context where knowledge can be evaluated and combined with existing knowledge. For instance, unlearning is a necessary process for the communication between realized absorptive capacity and potential absorptive capacity. Through unlearning firms make effort to modify organizational values, norms, change their cognitive structures, ideologies, and mental models aiming to leave space for the new approaches, skill and knowledge from outside. The research also focuses on the transition from individual level to the firm level by revealing the role of information systems in the retention and retrieval of new external knowledge acquired and assimilated. Hence in order for the potential absorptive capacity to be translated into realized absorptive capacity firms rely on unlearning and information systems at the organizational level.

The review of evolving redefinitions and reconceptualizations on absorptive capacity illustrates that the concept has evolved and expanded. Firstly through R&D activities firms develop a knowledge base which enables them to become familiar and identify specific scientific or technological knowledge residing outside the firm still related to the firm's products, technologies and markets. Over time, firms build up cognitive structures such as; learning routines, knowledge histories and stories, processes, policies, procedures and know-how which generate shared understandings and accomplishes the assimilation of external knowledge. Hence the new knowledge

encountered outside the firm can be comprehended and interpreted in order to be incorporated into these cognitive structures hence assimilated. Further according to some researchers (Zahra and George, 2002; Lane et al., 2006; Volberda et al., 2010) add the process of transformation to indicate that firms need to develop the ability to develop and refine routines and processes which facilitate the combination of the external knowledge through "bisociation". Consequently the firm becomes adept in utilizing that knowledge to foresee technological trends, innovative products and generate new markets and navigate itself strategically in order to exploit the opportunities and commercialize the assimilated knowledge (Lane et al., 2006).

2.2.6. The Micro-Foundations of Absorptive Capacity as Metaroutines

Aiming to scrutinize the deep roots of absorptive capacity Lewin et al., (2010) note that very few studies looked into the micro-foundations of absorptive capacity such as the metaroutines and processes embodying it. Hence, their research advances the absorptive capacity model to uncover the internal dimensions of absorptive capacity enforcing firms to initiate change from within. They offer a taxonomy of internal and external absorptive capacity capabilities in other words absorptive capacity metaroutines expresses as practiced routines (Massini, 2010). The first step the authors reveal is to distinguish between internal and external capabilities constituting absorptive capacity. The second step is to display how these capabilities are configured in the form of metaroutines.

Specifically, this taxonomy of internal and external routines is based on the research of Lewin and Massini (2003) which focuses on the internal knowledge generation through exploration and assimilation processes. This internal knowledge generation is based on the absorptive capacity capabilities regarding the management of variation, selection and reflection of knowledge. Variation, selection and reflection processes are adopted from the evolutionary economics based on the study of Nelson and Winter, 1982). Lewin et al. (2011) advances the framework offered by Lewin and Massini (2003) to identify the microfoundations of absorptive capacity and their articulation in the organizations in the form of practiced routines explicitly metaroutines. *Metaroutines* are the theoretical micro-foundations of absorptive capacity, where they are articulated and combined in various ways to form actual

practiced routines. *Practiced routines* are expressed in the form of rules, procedures, norms and habits which are unique and contextual for each organization. Indeed they embed tacit and explicit knowledge which is enhanced through trial and error, improvisation, learning by doing, directed search, variation, adaptation and selection processes (Lewin et al., 2011).

The authors categorize absorptive capacity as internal capabilities and external capabilities involving metaroutines which facilitate the regulation of activities related to the processes based on variation, selection and reflection of knowledge (VRS). *Metaroutines* are defined as higher order routines which describe the general purpose of routines and are exhibited through uniquely firm specific *practiced routines*. The model developed by Lewin et al. (2011) is shown in Figure 2.6.

The internal metaroutines, encompass formal and informal routines practiced contextually within the firm (i.e. organization-specific). They relate to metaroutines guiding the management of variation selection and replication processes. Constituting one of the absorptive capacity routines *facilitating variation* is concerned with the emergence and exploration of new ideas. Variation enables the development of novel ideas within organizations through a series of practiced routines of creating new knowledge and combining and recombining existing knowledge; such as open office plans, brainstorming sessions, solicitation of scientists and engineers to propose new ideas. Internal metaroutines further involve *the selection regimes* which serve to manage the internal diversity of projects and activities to invest in and allocate resources. Hence the selection of ideas encourages investments also in unconventional activities, exploration of new projects and experimentation of new markets/technologies.

Internal absorptive capacity capabilities also include the *sharing of knowledge and superior practices* across the organization. This capability regulates the practiced routines of knowledge sharing and integration through continuing interaction, effective social networking, cultivation of trust-based relationships, distributed knowledge according to the value of new practices. Effective ways to share knowledge and successful intra-firm practices are; cross-functional teams, face-to-face interactions through formal and informal structures, inter-departmental projects workshops and company-wide meetings. Moreover, the internal metaroutines involved within absorptive capacity contain also the *reflecting, updating and replicating processes* of knowledge. Firms in order to make use of internal

knowledge need to reflect on and update products, technologies and processes. The reflecting, updating and replicating processes promote the discovery of the existing processes and practices, in-depth and critical evaluation, learning by doing, retrospective sensemaking and knowledge codification. Particularly reflection routines reinforce the updating of capabilities consistently, and replacing of current practices through successfully implemented processes and practices (Lewin et al., 2011).

The external metaroutines, are those emphasized in the past conceptualizations of absorptive capacity such as those of Cohen and Levinthal (1989, 1990), Zahra and George (2002) which overestimate the role of acquisition and exploitation of extramural knowledge, yet ignores the internal micro-foundations for generating knowledge. The external metaroutines entail the identification of knowledge outside of the firm and developing routines for learning from the external organizations as well as learning with them. There are specifically two types of external metaroutines expressed in terms of practiced routines, namely; (1) identifying and recognizing the value of externally generated knowledge, (2) learning from and with partners, suppliers, customers, competitors, and consultants (Lewin et al., 2011).

Subsequently, two metaroutines that lie in the interface between internal and external metaroutines actualized within absorptive capacity are further introduced. These interface metaroutines are referred to as; (1) management of adaptive tension and (2) transferring the knowledge back to the organization. *Management of adaptive tension* serves to figure out the need to explore internal innovations of products and processes as well as external inspection of new practices and ideas. Indeed it enables the acquisition of external and the exploration of external knowledge. On the other hand *transferring the knowledge* back to the organization is related to the assimilation of the externally acquired knowledge in order to maneuver the organization and benefit from the newly explored knowledge.

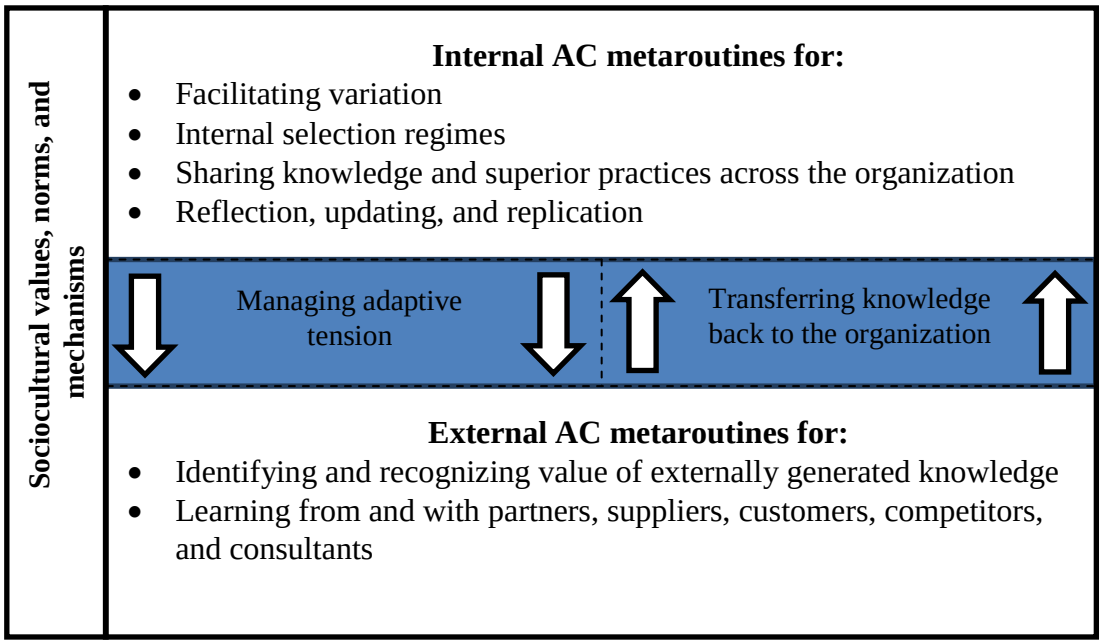

Figure 2.5: Internal and External Metaroutines Based on Lewin et al. (2011)

2.3. Operationalization and Measurement of Absorptive Capacity

The first step in empirical analysis of theoretical constructs is to give meaning and establish a rigorous definition for the constructs. Given the broad literature review on the absorptive capacity concept, representing its theoretical definitions and conceptualization we can now turn our attention to make an operationalization and reveal the measurement of the absorptive capacity construct.

Absorptive capacity being a critical multidisciplinary construct developing linkages between related fields of research such as organizational learning, knowledge management, and innovation management, requires an expanded and profound analysis for the specification of its dimensions, their measurement and validation. Although substantial effort has been made to empirically investigate absorptive capacity and its dimensions, a valid measure that incorporates its various dimensions simultaneously has been missing in the literature (Flatten et al., 2011). Most of the research in the absorptive capacity domain measures the construct through simple R&D proxies, neglecting its richness as well as generating a delinquency in revealing how these various dimensions influence different organizational outcomes (Jiménez-Barrionuevo et al., 2011). A limited research

effort attempt to develop an in-depth investigation of absorptive capacity based on the process-based view, by formulating a multidimensional operationalization for it (Jiménez-Barrionuevo et al., 2011; Flatten et al., 2011; Camisón and Forés, 2010; Jansen et al., 2005).

Albeit this is not an easy task, recognizing the intangible nature absorptive capacity researchers need to carefully develop and validate the measurement scale. Here, the resource-based view (RBV) offers a valuable explanation acknowledging the fact that intangible resources have been converted into the key to competitive success for many firms (Jiménez-Barrionuevo et al., 2011). Intangible resources can be defined as assets that belong to an organization and that are difficult to evaluate from an accounting perspective. The RBV analyzes the role these intangible resources play in achieving and sustaining competitive advantage. Explicitly RBV highlights that intangible resources provide greater opportunities for firms in time because as firms develop routines, habits and norms embedded within the organization to systematically apply the intangible resources they become more experienced and more capable which prevents the imitation of unique and valuable intangible resources possessed by them. However this intangible nature of absorptive capacity both provides an advantage for firms as translating to sustained competitive advantage but also disadvantage for its measurement.

Research published up to date increasingly agree that absorptive capacity is a multidimensional construct and theoretically acknowledge the various components and different contents encapsulated within. However empirical investigations have not come to any consensus in establishing a common ground in terms of the number nor of the particular dimensions representing absorptive capacity as a dynamic-capability which relies on the process undertaken by them in building upon each other. Indeed there is a need for intensified efforts in order to identify specific firm characteristics generating this absorptive capacity (Patterson and Ambrosini, 2015).

Although a high volume of studies mainly agree on the process-based definition and multidimensional nature of the absorptive capacity, the literature neglects the variety of dimensions ascribed in absorptive capacity. Indeed, the research on absorptive capacity proliferate studies in which the concept is operationalized through uni-dimensional proxies such as R&D effort, outputs, inputs and investment (George at al., 2001; Lane and Lubatkin, 1998; Zahra and George, 2002). Since its emergence, absorptive capacity has been regarded as the result of a

cumulative path dependent R&D investment. Based on this conceptualization studies use a variety of proxies which attempt to measure absorptive capacity indirectly and uni-dimensionally. The proxies used for the measurement of absorptive capacity are shown in Table 2.2 which can be listed as; number of patents, R&D intensity, number of academic publications, IT knowledge of management, investments in R&D employees, investments in technical and academic education, postgraduates in R&D, number of R&D employees, R&D departments with doctorates, R&D departments engaged in scientific research, responsiveness to incentive systems and learning incentives H&R management, labor productivity, value of IT, managerial information technology (IT) and its effectiveness and knowledge of business processes (Flatten et al., 2011; Zahra and George, 2002).

Table 2.2: Measurement Proxies used for Absorptive Capacity

Research	Theorotical Lens	Measurment Proxies
Cohen & Levinthal (1989)	R&D Investments	R&D Intensity
Cohen & Levinthal (1990)	Organizational learning; economic theory	R&D intensity: Responsiveness of R&D to learning incentives (relevance, ease, and appropriability)
Mowery & Oxley (1995)	Comparison of inward technology transfer channels and national innovation systems	Investments in scientific and technical training and economic policies that enforce competition
Mowery, Oxley & Silverman (1996)	Strategic alliances and in-house knowledge transfer	Patents and R&D-intensity
Szulanski (1996)	Organizational learning / strategic management	Scale formed of 9 items to measure global absorptive capacity
Heeley (1997)	Knowledge spillovers /entrepreneurship	Scale of 24 items to measure the acquisition of new knowledge from outside the firm and the dissemination of this knowledge within the firm
Veugelers (1997)	Organizational learning / innovation	Employee of R&D, postgraduates in R&D, proportion of R&D in basic research
Cockburn & Henderson (1998)	Industrial/organization economics	Number of publications based on dollars spent on research annually
Kim (1998)	Organizational learning theory; organizations as learning systems	Changes in firm orientation toward use of assimilated technology; transition from technology assimilation to imitate to development of internal R&D functions to innovate
Lane & Lubatkin (1998)	Organizational learning theory; resource-based theory	8 total measures based on valuing new knowledge (2), assimilating new knowledge (5), and commercializing new knowledge (1)
Mangematin & Nesta (1999)	Knowledge Management / Organizational Learning	R&D expenditure, number of researchers, duration of R&D activities, number of R&D laboratories, links with public research institutes, number of publications, and number of patents

Van den Bosch, Volberda & De Boer (1999)	Organizational form and ability	Incentive system
George, Zahra, Wheatley & Khan (2001)	Relational and Organizational Learning / Strategic alliances	Expanditure on R&D and the number of patents
Lane, Salk & Lyles (2001)	International Joint Ventures	Adapt the scales from other related studies and create a new scale of 24 items to measure the comprehension, assimilation and application of knowledge
Tsai (2001)	Firm performance and innovation success	R&D Intensity
Stock, Greis & Fischer (2001)	New product development	R&D Intensity
Lin, Tan & Chang (2002)	Technology Management / transfer	Scale formed of 15 items used to measure capacity for adaptation, production and application of knowledge
Lenox and King (2004)	Absorptive capacity development on management level	Knowledge management (flow of information)
Jansen, Van Den Bosch & Volberda (2005)	Organizational Learning in Organizational Units	Scale of 21 items used to measure potential absorptive capacity (acquisition and assimilation of knowledge) and realized absorptive capacity (transformation and exploitation of knowledge)
Nieto and Quevedo (2005)	Knowledge spillovers/ innovation	Scale formed of 32 items to measure communication with the environment, the organization's level of knowledge and experience, the diversity and coincidence of structures of knowledge and strategic position
Vinding (2006)	Innovation success	HR management
Muscio (2007)	Effects of co operations in SME	In-house items: degree of employees which are assigned with R&D activities or in-house education
Spithoven et al. (2010)	Organizational Learning / innovation	R&D activities aimed at developing new knowledge and other activities such as knowledge intelligence and knowledge dissemination activities
Kostopoulos et al. (2011)	Innovativeness	R&D expenditures, number of employees with bachelor degree, consistent R&D activities, training to R&D personnel

Nevertheless, the utilization of these indirect measures have resulted in contradictory and misleading findings about the nature and outcomes of absorptive capacity. R&D patents or spending, nor personnel cannot be fully measuring absorptive capacity since they highly differ in terms of their knowledge content across firms as well as their degree of representing the propensity to innovate (i.e. not every innovation is patented). Indeed, measures concerning solely the R&D context of firms do not capture the complexity of absorptive capacity; ignore its process-based nature (Flatten et al., 2011).

As suggested by Volberda et al., (2010, p. 932) "aspects that are 'distinctly organizational' shape a firm's absorptive capacity beyond the sum of employee's individual absorptive capacities." It is therefore necessary to bear in mind that simply adding the knowledge base of the individuals working in the organization does not lead to the absorptive capacity at the organizational level (Van Den Bosch et al., 2003). Indeed, the narrow focus of the absorptive capacity literature up to date mainly underlining the R&D based operationalization of the concept (Van Den Bosch et al., 2003) needs to be abandoned. Parallel to this concern, researchers consistently call the attention to the non-R&D context feeding absorptive capacity, which requires further investigation and exploration for the development of a valid multi-dimensional measure of absorptive capacity (Matusik and Heeley, 2005).

Acknowledging that there is a need for measuring absorptive capacity through various intangible aspects other than on an R&D basis, research develops different multi-item instruments covering the set of aspects that embody absorptive capacity, such as methods of compensation, dominant logic, knowledge base, management practices, strategy, organizational structure, information management systems and organizational culture. Despite these methodological endeavors, the conceptualization of absorptive capacity still lacks a firm base in the theory, and likewise, the consolidation of a commonly used instrument with which to measure the construct is long overdue.

Some subsequent studies evaluate absorptive capacity in two dimensions, relating the first dimension to the evaluation, acquisition and assimilation of external knowledge and the second dimension to the dissemination and application of this acquired knowledge (George et al., 2001; Heeley, 1997; Kim, 1998). George et al., (2001) considers absorptive capacity as two dimensions and defines it as the firm's

ability to evaluate/assimilate and apply knowledge received from external sources such as suppliers, customers, competitors and alliance partners.

Originally Cohen and Levinthal (1990) propose a three dimensional conceptualization as I explained previously in this thesis, namely; recognition of the value of external knowledge, assimilation and utilization. These three dimensions correspond to three abilities underlying absorptive capacity. Various other researchers capture three dimensions of absorptive capacity (Lane and Lubatkin, 1998; Lane et al., 2001; Matusik and Heeley, 2005; Szulanski, 1996), such as; the ability to understand, assimilate and apply external knowledge. Lane and Lubatkin (1998); presents similarity of the knowledge bases of the absorbing (i.e. student firm) and the host firms (i.e. teacher firm) as the first dimension. This dimension reflects the know-what of the firms. The second dimension is the know-how and the third dimension is the compatibility of the two firms' commercial objectives.

Lane et al., (2001) in another three dimensional operationalization refers to; (1) the ability to understand knowledge, (2) the ability to assimilate and (3) the ability to apply external knowledge. However they conclude that absorptive capacity may be measured through two dimensions since the results of the study reveal that the first two dimensions differ significantly from the third dimension, hence suggesting that acquisition and assimilation can be counted as the first dimension and the utilization can be regarded as the second dimension.

Nevertheless, one of the most comprehensive researches in the literature regarding the operationalization of absorptive capacity is that of Zahra and George (2002) where the authors adopt a process perspective of absorptive capacity and distinguish between firm’s realized and potential absorptive capacities building the theoretical framework on the dynamic capabilities of the firm. Zahra and George (2002, p. 186) have noted that absorptive capacity is “a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to generate a dynamic organizational capability”. Accordingly the study enlarges the concept and identifies four dimensions of absorptive capacity namely; acquisition, assimilation as part of potential absorptive capacity; transformation and utilization, as part of realized absorptive capacity. The authors consider potential absorptive capacity as a second-order latent factor represented by two dimensions namely; knowledge acquisition and assimilation capabilities; and realized absorptive capacity

as a second-order latent factor reflected through knowledge transformation and application.

Similiarly Jansen et al., (2005) and Todorova and Durisin (2007) adopt the four dimensions subsumed under the two components; realized and potential absorptive capacities. Many studies thriving for the scale development, validation and empirical measurement of absorptive capacity use these dimensions (Flatten et al., 2011; Jiménez-Barrionuevo et al., 2011; Camisón and Forés, 2010; Todorova and Durisin, 2007). Camisón and Forés (2010) based on Zahra and George's (2002) reconceptualization adopted the potential and realized absorptive capacities as second order latent constructs consisting of acquisition, assimilation and transformation and utilization respectively. Further they validated the measurement scale developed based on these distinct dimensions.

Volberda et al., (2010) remarks that although, the different operationalizations of absorptive capacity, various dimensions used and the variety of the contexts in which they are used contribute to the richness and expansion of absorptive capacity research field there are some concerns when empirical studies are taken into account. These concerns are;

1. Empirical studies adopt a static approach of absorptive capacity although they reinforce Cohen and Levinthal's dynamic, developmental, path-dependent conception regarding absorptive capacity.
2. The majority of empirical studies utilize uni-dimensional proxies such as R&D expenditures, number of patents or R&D personnel rather than direct multi-dimensional measure valuing the dynamic nature of the construct.
3. Most research treats absorptive capacity as an independent variable and do not attempt to consider it as a second-order latent construct which is composed of different components except a few, explicitly; Lane et al. (2001), Jansen et al. (2005), Lichtenthaler, (2009), Leal-Rodriguez et al., (2014), Ebers and Maurer (2014) and Lin et al. (2012).
4. Studies mainly analyze absorptive capacity from a fixed level of analysis. Absorptive capacity can be analyzed from an individual, unit, firm and inter-firm level, anyhow most studies concentrate on the unit or subsidiary level absorptive capacity.
5. The process-based view is neglected hence preventing the exploitation of process dimensions which can promote the viability of absorptive capacity,

such as prior knowledge storage, retrieval, sensemaking and improvisation as the mechanisms of knowledge retention and expression. Here the representation of hidden knowledge and value systems embodied within organizational symbols calls the attention for further development of absorptive capacity.

2.4. The Dimensions of Absorptive Capacity

In this thesis, the dimensions of Zahra and George (2002) are adapted which represent the most extended re-conceptualization of the absorptive capacity concept, identified as: *acquisition* which is "the firm's ability to identify and acquire externally generated knowledge" (p. 189), *assimilation;* as the analysis, interpretation and internalization of externally obtained knowledge through organizational mechanisms such as routines and processes, *transformation;* as the ability to combine prior knowledge and newly acquired and assimilated knowledge, and *exploitation (utilization);* as the firm's capability to incorporate the transformed knowledge into its operations in order to enlarge and improve existing competencies to generate new ones.

Here, acquisition and assimilation dimensions leverage firms' abilities to receive and recognize the value of external knowledge, and transformation and exploitation dimensions serves to leverage the absorbed knowledge as the primary source of performance improvements (Zahra and George, 2002). As suggested by March (1991) the exploration and exploitation phenomena need to be balanced in order to gain relatively high benefits ejecting from the relevant costs of experimentation, since they compete for the same resources.

Unlike previous studies, which indicate sequential relationships among those dimensions that mask the individual effects of the components on the firm innovativeness, in this thesis I argue that those dimensions are covariant. Covariance refers to the co-occurrence of acquisition, assimilation, transformation and exploitation constructs (for instance, acquisition leads to assimilation and vice versa). This approach explains how absorptive capacity comes about, it encompasses a definite set of events or occurrences, and points out constructs where absorptive capacity is a function of. Specifically, this perspective describes the activities or experiences of individuals or organizations and specifies what happens within

absorptive capacity (Akgün et al., 2009). In a sense, here, each dimension represents facets of absorptive capacity that could be a separate construct but remain as the integral parts of absorptive capacity.

2.4.1. Acquisition

Acquisition capacity is a firm's capacity to locate, identify, evaluate and acquire external knowledge that is important for the firm activities, products and processes (Jiménez-Barrionuevo et al., 2011). It focuses on the search for information in the external environment and acquisition of that knowledge. Acquisition attracts the widest attention and is seen as the most important aspect with relation to external knowledge and absorptive capacity (Camisón and Forés, 2010). It can occur through formal or informal means through a broad range of activities. Identification is a critical aspect of knowledge acquisition capability hitherto firms cannot transfer knowledge from the outside environment unless it detects and evaluates the role of it for its critical operations (Flatten et al., 2011).

Acquisition has also an important role in terms of the search, the development of new connections, speed of learning, and quality of learning. The degree of achievement of firm's knowledge acquisition routines is determined through the intensity, speed and direction. Specifically, the more intense and the faster and more accurately directed towards the needed knowledge assets, is the knowledge acquisition process, accordingly the more successful the firm will be in recognizing and acquiring the knowledge from external sources (Zahra and George, 2002).

Nonetheless there exist some limitations to the ability of firms' knowledge acquisition due to the length of learning cycles and the difficulty of mobilizing the resources required for setting up absorptive capacity. These limitations bring about increased length of time for the acquisition of knowledge.

Also the various paths of knowledge exploration the firm chooses to follow which differ in terms of complexity and richness, are influenced by the direction of accumulating knowledge (Zahra and George, 2002). Knowledge acquisition capability of firms is also dependent on the prior investments and prior knowledge of the firms.

2.4.2. Assimilation

Assimilation of knowledge captures organizational routines that allow the firms to comprehend, analyze, process and interpret knowledge accessed from external sources (Lin et al., 2012). Assimilation capacity is a firms capacity to comprehend the knowledge acquired from outside the organization, analyze, classify process, interpret, and ultimately internalize and understand this knowledge (Jiménez-Barrionuevo et al., 2011). Firms have higher knowledge assimilation ability if they succeed to; (1) understand knowledge which is not readily transferrable, (2) capture the heuristics which are not congruent with firm's own problem solving techniques, processes and procedures, (3) perceive and associate context specific knowledge located in the external setting of the firm, and (4) process and replicate the acquired knowledge by adequately interpreting it.

Zahra and George (2002) argue that assimilation serves to comprehend and replicate externally generated knowledge specifically through existing knowledge structures and learning schemes. Because the value o the knowledge becomes hard to detect when there are no complementary knowledge assets possessed by the firm within its existing knowledge base.

The ability to assimilate new knowledge, can also be reflected upon the flexibility and adaptability of firms, support from management, training, and the formal objectives and specialization of the parties involved in the knowledge exchange (Jiménez- Barrionuevo et al., 2011). The degree of assimilation increases through the existing cognitive structures since through compatible knowledge bases or frameworks the external knowledge seems to be situated within the knowledge search domain of the firm (Todorova and Durisin, 2007). Hence assimilation, indicates the ability of firms to comprehend, interpret and alter the external knowledge acquired to fit the knowledge structures.

2.4.3. Transformation

Transformation of knowledge indicates a firm's ability to develop routines that facilitate the combination of existing knowledge structures with newly acquired and assimilated knowledge (Lin et al., 2012). Zahra and George (2002, p.190) define transformation as "…a firm's ability to develop and refine the routines that facilitate

combining existing knowledge and the newly acquired and assimilated knowledge". To understand how firms are able to transform their knowledge structures to accommodate the newly acquired and assimilated knowledge, the interpretive organization theory would be helpful. According to the interpretation approach organizations understand and act based on their interpretative schematas which allow them to make sense of the existing organizational phenomena within or outside the organization. Different cognitive structures/frameworks lead to different interpretations of the phenomena (i.e. in the context of absorptive capacity the external knowledge to be absorbed is the relevant organizational phenomenon).

Simply firms by interpreting the external knowledge acquired and assimilated can obtain different meanings out of the same knowledge which can be used for the appropriate processes and operations of the firm. Indeed in order to differently interpret the knowledge, different cognitive frameworks are used which result in different versions or different meanings of the same knowledge. Transformation ability refers to this process as bisociation indicating that two self-consistent but incongruous frames of reference are used (Zahra and George, 2002).

Through transformation, the irreconcilable knowledge sets which are; the existing knowledge of the firm and that assimilated from the external settings, are incorporated to form a new cognitive schema. For this process the existing knowledge structures/cognitive schema needs to be modified to accommodate with the externally acquired and assimilated knowledge (Todorova and Durisin, 2007).

2.4.4. Exploitation

Exploitation is a firm's ability "…to refine, extend, and leverage existing competencies or to create new ones by incorporating acquired and transformed knowledge into its operations…Exploitation reflects a firm's ability to harvest and incorporate knowledge into its operations" (Zahra and George, 2002, p.190). Cohen and Levinthal in their influential original study on absorptive capacity emphasize the application of the knowledge acquired and assimilated. This ability to apply knowledge for commercial purposes relies on the routines enabling firms to refine, expand, reconfigure and leverage existing knowledge base and the competencies as well as to generate new knowledge to utilize for firm's operations.

The routines for the application of knowledge in firm's operations promote a systematic, structured, deliberate and procedural mechanism through which knowledge can be exploited. These are referred to as systemic exploitation routines which drive the achievement of competitive advantage by generating novel products, processes, systems, knowledge or structures.

Exploitation capability also allows the firm to extend, improve or generate routines, processes, competences and organizational structures (Camisón and Forés, 2010). These core competences and outputs of commercialization opportunities serve to differentiate the firm in the competitive market and enable to gain sustained competitive advantage (Zahra and George, 2002). Therefore the ability of knowledge exploitation is strategic for firms which is essential in value creation out of the absorbed knowledge (Jiménez-Barrionuevo et al., 2011).

The dimensions explained in this section of the thesis reflect the dynamic, process-based view of the absorptive capacity and each play a distinctive but complementary role in illustrating how firms develop absorptive capacity, how do they achieve greater or lesser capability to absorb external new knowledge. The dimensions of absorptive capacity, based on various studies adopting the acquisition, assimilation, transformation and exploitation dimensions of absorptive capacity are presented in Table 2.3.

Table 2.3: Dimensions of Absorptive Capacity

Dimensions	Definitions	Illustrative Research
Acquisition	Acquisition capacity is a firm's ability to locate, identify, value and acquire external knowledge that is critical to its operations.	Heeley (1997); Todorova and Durisin, 2007; Zahra and George, 2001; Camisón and Forés, 2010
Assimilation	Assimilation capacity refers to a firm's capacity to absorb external knowledge. This capacity can also be defined as the processes and routines that allow the new information or knowledge acquired to be analyzed, processed, interpreted, understood, internalized and classified.	Lane and Lubatkin, 1998; Lane et al., 2001; Zahra and George, 2001; Lane et al., 2006; Todorova and Durisin, 2007*; Lichtenthaler, 2009**; Camisón and Forés, 2010
Transformation	Transformation capacity is a firm's capacity to develop and refine the internal routines that facilitate the transference and combination of previous knowledge with the newly acquired or assimilated knowledge. Transformation may be achieved by adding or eliminating knowledge, or by interpreting and combining existing knowledge in a different, innovative way.	Zahra and George, 2001; Todorova and Durisin, 2007*; Lichtenthaler, 2009**; Camisón and Forés, 2010
Utilization	Application or exploitation capacity refers to the organizational capacity based on routines that enable firms to incorporate acquired, assimilated and transformed knowledge into their operations and routines not only to refine, perfect, expand and leverage existing routines, processes, competences and knowledge, but also to create new operations, competences, routines, goods and organizational forms.	Zahra and George, 2001; Lane et al., 2006; Todorova and Durisin, 2007; Lichtenthaler, 2009**; Camisón and Forés, 2010

*Todorova and Durisin (2007) suggests that assimilation and transformation are not sequential processes, they are rather alternative to each other.

**Lichtenthaler (2009) considers exploratory learning, transformative learning and exploitative learning instead of respectively; recognition and acquisition assimilation or transformation and utilization.

3. ORGANIZATIONAL SYMBOLISM

Modern scientific rationality have been criticized heavily over years due to its inherent nature considering organizational phenomena as objective and free from the subjective worlds of the organizational members (Sandberg and Tsoukas, 2011). Modernist organization theories treat organizations as functional entities structured to reach a desired outcome, particularly; high performance, productivity or efficiency. However, the main responsibility of organization theory as in all of the social sciences is to discover the meaning constructed by the organizational members regarding the observed phenomenon (Hatch and Yanow, 2005). Particularly the critiques directed towards a positivist stance regarding organizations and organization theory have been mounted over the past three decades.

The rise of the interpretive paradigm, namely interpretive organization theory and its relevant approaches such as phenomenology, hermeneutics and ethnomethodology have established an alternative perspective in the analysis of organizations and organizational phenomena. Along with, case studies, field research, ethnographical analyses and qualitative methodology have emerged as alternative techniques to the objectivist, empiricist claims of positivism where the organizational reality is regarded as appearing independently from the observer and needs to be discovered through observation and application of appropriate empirical methodologies (Alvesson and Sköldberg, 2009). In contrast to the causal models of functionalist-modernist organization theory, the use of cultural themes, images, subjective meanings and interpretations have emerged along with the interpretive organization theory (Schultz and Hatch, 1996). The taken for granted assumptions held by positivist[2] organization theorists, which assume that organizational phenomena can be objectively observed by organizational members or theorists were criticized by interpretive theorists and instead it was assumed that the observed reality is not out there ready to be discovered, rather it is socially constructed by the interpretive schemes, meanings associated to the subjective, symbolic aspects of organizational life.

[2] Positivism was developed by the French philosopher Auguste Comte (1853) emphasizing the notion that external reality appears independently from the observer and it can be objectively observed. If the correct methodology is used, the observed would have no influence on the empirical data. Accordingly the truth is nested within the observer's passive recording of the positively given in the external world (McAuley et al., 2007).

3.1. Reflective Approach to Organization Science

In conjunction with the emergence of interpretive approach in organization theory; researchers emphasized the importance of subjective ways to make meaning about the events, situations and actions encountered within and outside of the organizations. The acknowledgement of the dependency between the "socially constructed" phenomena and the social actors (i.e. organizational members or organizational theorists) enforces the use of an approach where the prescriptive outcomes presented at the surface of the organizational phenomena need to be dug deeper in order to see the hidden, subjective and unconscious layers of the "reality". This approach to develop a self-critical perception regarding the observed/demonstrated events, states and situations and deeper exploration of the alternative interpretations of the organizational phenomena is recalled as the *reflective attitude*.

Organizational theorists adopting the organizational symbolism approach to analyze the organizational phenomena contend that through exhibiting a *reflective attitude*, organizational symbols can be shown to reveal a broad array of meanings, unconscious feelings and values, deep-rooted knowledge cues associated with the organization. Reflective attitude has important implications for organizational research, as explicitly stated below (McAuley et al., 2007);

1. **Reflective attitude enables to understand the link between observed representations of events, actions, situations, particularly organizational symbols (the facts and figures) and the interpretation of the information embedded within those representations.** Indeed, there are multiple-ways for the manifestation of knowledge diffused in different units, different structures and members of the organization and those can result in many interpretations. This accounts for the retention of the plurivocality and of subjective meanings. For the organization theorists, this multiplicity of meaning means that the researcher needs to possess the ability to capture the complexity of interpretation in the development of theory; for the organization member, it means understanding that many features of the situation are not what they seem to be.

2. **Reflective attitude enables to comprehend that the language and the verbal representations used throughout the organization is typically not as straightforward as it might seem.** Indeed it includes a wide variety of subjective elements embedded within the cognitive frameworks of the organizational members. The cognitive frameworks pursued serve as the comprehension and expression mechanisms of the members. As organizations develop, members characteristically build up a 'common sense' out of these cognitive frameworks ways of sharing experiences and expressing events and processes.

This approach within organization science is associated with interpretivist organization theory and theorists. At this point it would be useful to briefly summarize the contrasts of positivist-modernist organization theory and interpretive organization theory.

3.2. Positivist versus Interpretivist Organization Theory

Positivist organization theory emerged in light of the Enlightenment Project and positivist approach in social sciences where the aim was the emancipation of human beings from the domination of myths, dogmas and supernatural explanations. For positivism everything that can be observed through the five senses are considered to be objective realities, otherwise (i.e. phenomena non-observable through sensory apparatus) their existence (i.e. reality) should be questioned. The positivist stance can be illustrated as in Figure 3.1 adapted from McAuely et al., (2007).

Indeed positivism holds the premise that the observer's mind (e.g. organizational member, organizational theorist) directly mirrors the truth out there and the positivist methodology represents it neutrally (McAuley et al., 2007). In organization theory positivism seeks to develop general theories rooted in the universal laws of natural sciences and therefore reveals the causal regularities underlying the observed organizational phenomena. The aim is to explain an organizational phenomenon (e.g. organizational change, organizational design etc.) in terms of its underlying causes.

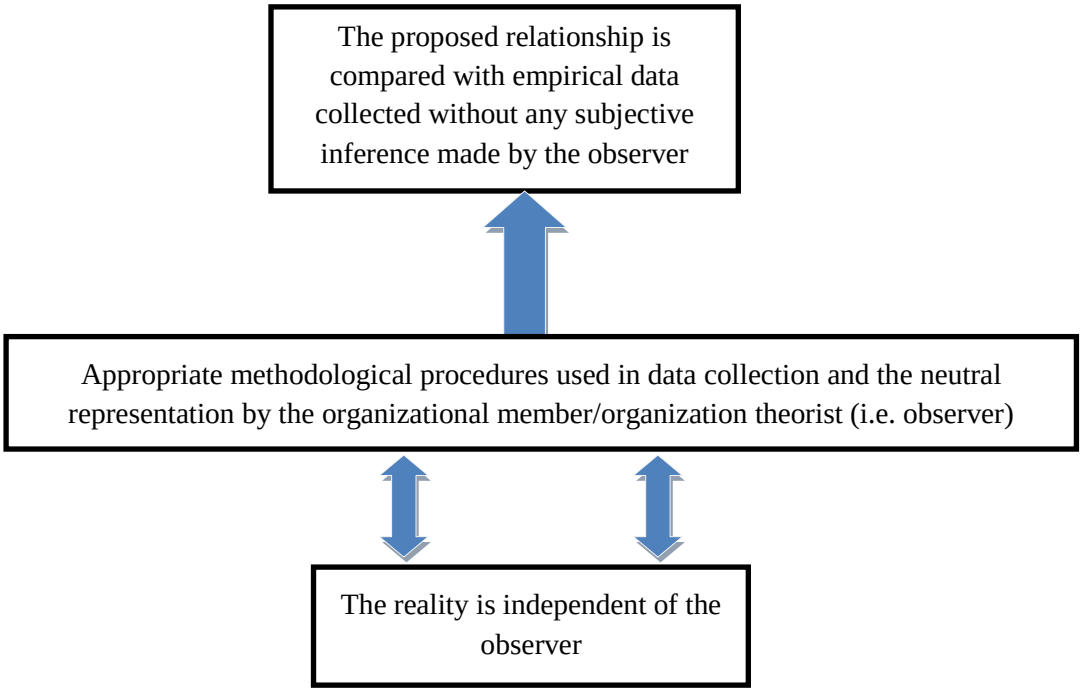

Figure 3.1: The Positivist Approach to Organization Theory

Positivism is reflected into organization theory mainly under the functionalist paradigm (Donaldson, 2005). The functionalist paradigm is derived from systems theory in sociology and anthropology as represented by theorists such as Durkheim, Parsons and Merton (Schultz and Hatch, 1996). Functionalism stands for the rationale behind the "rational models view" of organizations. Explicitly; organizations and organizational decision makers have a tendency to choose the options (e.g. structures, activities, processes) that best fit the situation to give the most effective results/outcomes. Echoing Durkheim's (1938) contention cited in Donaldson (2005), regarding the causality being external to social actors (i.e. individuals); the only organizational structure or the activity that most effectively fits the emergent phenomena hence resulting in the most functional outcome is chosen.

Interpretivist organization theory on the other hand considers the human actors' explicitly organizational members' and organization theorists' subjective processes of perceiving, interpreting, and sensemaking of the situations and events occurring around them to be critical in the construction of organizational reality. The outside world is not independent from the observer as suggested by the positivist stance. Indeed, the internal logic, the cognitive framework or the frames of reference unconsciously held by organizational members and also organizational theorists shapes the organizational phenomena. The behaviors of organizational actors

individually and the organizational phenomena occurring collectively is a result of the subjective sensemaking and interpretation processes of human beings.

In the context of organization theory and organizational life, the organizational phenomena is assumed to be the result of the subjective cultural worlds of organizational members (McAuley et al., 2007). The interpretivist stance to organization theory can be illustrated through Figure 3.2 adapted from McAuley et al. (2007). Interpretive organization theorists acclaim a subjectivist epistemological perspective in examining the questions such as "how do we know that particular "thing" we claim being the truth about the organization?" or "what is the foundation of our proposed truth/claim?" Particularly the knowability of organizational phenomena is based on the subjective accounts of the organizational members which accordingly develop as the interactions take place within the organizational domain. With the emergence of interpretive organization theory, concepts such as meaning, understanding, interpretation started to be investigated and especially addressed (Hatch and Yanow, 2005).

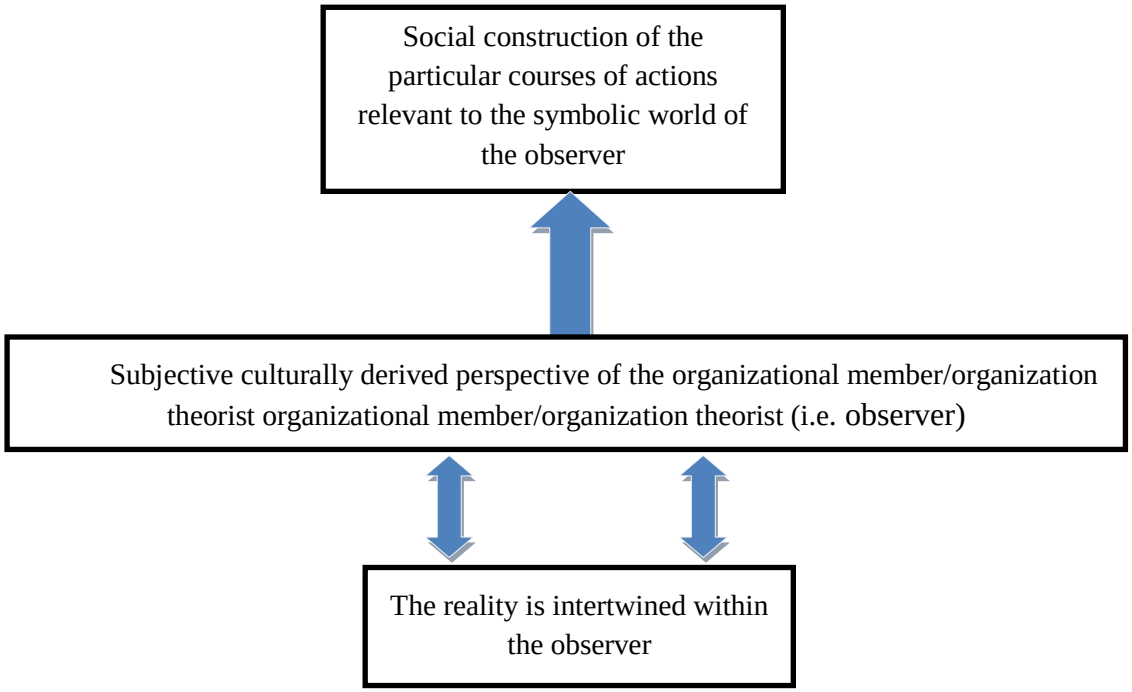

Figure 3.2: Interpretive Approach to Organization Theory

This approach underlies the distinction between the treatment of organizational culture from a positivist versus an interpretive stance. The interpretive approach to culture explicates that the knowability of organizational phenomena is subjective, therein need to be reached through the analysis of symbolic manifestations of the

hidden layers under the visible surface. Hence one of the most prominent areas within the interpretive organization theory is; organizational culture and symbolism which investigates the symbols enacted within the organizational context shaped by the culture. In this sense culture is regarded as a system of shared symbols and meanings which generate a common mode of interpretation, perception, and thinking, feeling and acting frame (Turner, 1986).

Organizational culture and symbolism developed through the influential studies of Schein (1985), Turner (1990), Dandridge et al. (1980) devoting their interest and theoretical contribution to symbolic-interpretive studies of organizational cultures (cf. Barrett et al., 2011; cf. Smircich 1983). The idea that organizational culture is something that cannot be objectively identified and understood from the outside is plausible, hence predominantly addressed in organizational culture and symbolism studies (Beyer and Trice, 1987). Indeed organizational culture which refers to the elusive character, hidden values, unconscious knowledge and knowing/comprehending/interpreting schemes, and cognitive templates cannot be accessible through objective observation but rather through the meanings developed by organizational members. The meanings and their significance are manifested through organizational symbols which reveal the essence of organizational life (McAuley et al., 2007). As the recognition of the subjective meanings and interpretation in organizations and organizing the inherent meanings are thought to be expressed, communicated and diffused within organizations through organizational symbols (McAuley et al., 2007).

3.2.1. Organizational Symbolism Defined

The organizational symbolism is a field and a particular approach within organization theory which interprets social life as consisting of, communicated through, acted upon and indeed constructed through the symbols and meanings which are the essential parts of social context. Symbols and meanings underlie the collective action and the social order in organizations and organizational life. They are primarily defined as something signifying a wider or a different “thing” than itself. They consist of objects, acts, concepts or linguistic formations which encapsulate a variety of meanings, feelings, values and call for actions (Alvesson, 1991). Organizational symbolism indicates that the organizational members are

actively engaged in the process of constructing organizational realities. Indeed the research on organizational symbolism unveils the opportunity to gain wider and deeper understanding regarding the organizational issues by analysis of, representations such as objects, actions, relationships or verbal/linguistic structures that stand for the subjective meanings of the various aspects of organizational life (i.e. organizational activities, communication, change etc.), arouse emotions and drive for actions (Vaughn, 1995).

Particularly research tapping into organizational symbolism domain regards organizations as symbolic entities where symbolic processes and structures are inevitable mediums through which organizational order is achieved (McAuley et al., 2007). Organizational symbolism focuses on the role of symbols in information processing and creating and maintaining meanings in organizations by encompassing verbal form of organizational symbolisms, such as language, metaphors, and stories (Finkelstein, 2003).

As cited in the book by Geertz (1973) French anthropologist Lévi Strauss highlights that scientific explanation (e.g. on organizations) does not consist in the reduction of the complex to the simple, rather it consists in the substitution of a complexity which is more intelligible for one which is less. Therefore the permanent issue is to "render the incomprehensible comprehendible". Symbols in organizational life thrive for the reflection of the incomprehensible and do this by seeking complexity and ordering it (Geertz, 1973). They are enacted within the context of the organization which comes into existence through organizational culture constituting the frames of reference characterizing organizations and guiding organizational members for their actions. There is a reciprocal relationship between symbols and organizational culture. Symbols are suggested to be the vehicles for the enactment of culture and culture is claimed to be the platform through which the meaning of symbols is determined (Pratt and Rafaeli, 1997).

Organizational symbolism developed its position within organization theory subsequently during the 1980's a counter approach to the positivist ideology of functionalism dominating the organizational research domain. Organizational symbolism has been pioneered by important sociologists, anthropologists, social psychologists such as Geertz (1973), Goffmann (1967), Turner (1977), Dandridge et al., (1980) who commonly emphasize the need to analyze organizational phenomena and the involved members in their life-positions (inseparable contexts which are

intertwined with the meanings and subjects) and examine the sets of symbolism adopted for the comprehension, systematization and expression of the organizational life around them (cf. Hatch and Yanow, 2005). Various scientific disciplines such as anthropology, sociology, psychology and humanities have contributed to the development of the research on symbols (Alvesson, 2003). Especially in the past two decades a growing number of organizational research focused their attention to the investigation of organizational symbolism due to its inclusion of subjective meanings, hidden value systems, inherent character, feelings and unconscious knowledge embedded within, in order to understand the organizational life.

The aim of organizational symbolism is to focus on the aspects of organizations which are practiced by its members to uncover and make understandable the hidden values, unconscious feelings, knowledge, images and thoughts rooted within the organizations' activities, structures, relationships, narratives, interactions and physical representations (Barrett et al., 2011).

Organization symbolists assume that there are many alternatives of the reality involved within the organizational life which is constructed by organizational members and groups of members through the generation of symbols and the associated subjective meanings used for these symbols. These symbols and their meanings either develop within the organization through interaction (i.e. symbolic interactionism) or are brought into the organizational domain from the wider social environment (i.e. organizational symbolism). For instance the "leadership" concept is brought into organizations from outside social world through elements of our prior experiences, movies, other organizations, political, and everyday social life. Symbols are thought to constitute the core aspects of organizational life. Indeed they reflect the organizational phenomena such as power and influence, decision making processes, issues regarding control, organizational structure and change confronted by the members through the daily basis (McAuley et al., 2007).

Organizational symbolism conceptualizes organizations as a collection of subjective meanings established by organizational members which in turn result in organizations as social constructions. The various alternatives of conceptualizations for organizations are summarized in Figure 3.3.

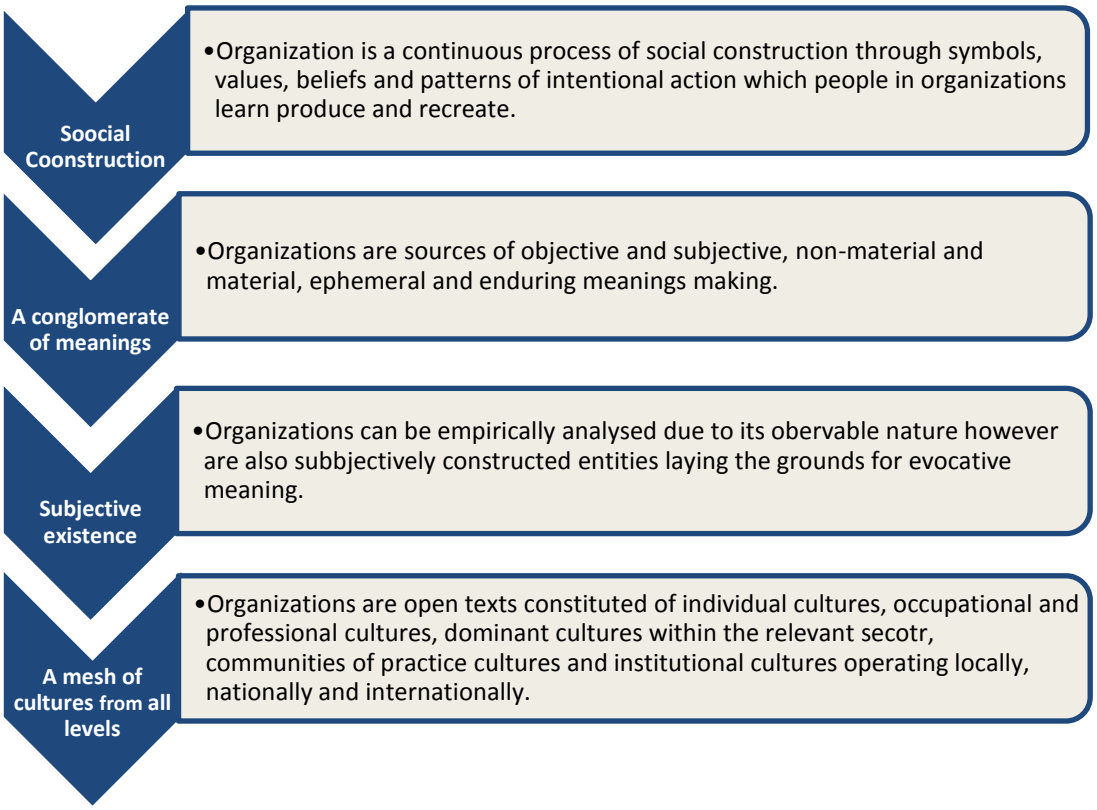

Figure 3.3: Organizations from a symbolic perspective

Hence organizational symbolism stream of research, addresses the investigation of artifacts, language, metaphors, rites and rituals, stories and myths. These representations and manifestations of hidden aspects and deeper layers of the organization are enacted and become the informal social norms or habits because they are the outcome of a shared frame of reference, common cognitive schemata more explicitly *interpretive organizational culture* which shapes and guides organizational members perceptions, meanings and actions (Pratt and Rafaeli, 2001). Indeed organizations are seen as the "culture-bearing milleux" where shared social ideals, shared frames of reference and shared symbols are created, modified and transmitted without any direct or conscious intervention from within the organization (Turner, 1986).

3.3. Organizational Symbols Defined

Organizational symbols are defined as anything such as event, relationship or object that conveys meaning. Organizational symbols can be physical objects or artifacts, individual or group behavior, as well as verbal expressions (Pratt and

Rafaeli, 2001). Anthropologist Abner Cohen (1976) cited in the study of Vaughn (1995, p.220) define symbols as "objects, acts, relationships or linguistic formations that stand ambiguously for a multiplicity of meanings, evoke emotions and impel men to actions". Meanings within symbols are not static hence organizational members can ascribe multiple and changing meanings to them. The constantly changing, dynamic and ambiguous nature of organizations complicates the relationships between individuals and organizations. Organization systematize the complexity of organizational life through symbols that offer organizational members and organizations access to a rich, non-verbal "language" that can help clarify this relational complexity.

Turner (1968, p. 5), cited in the work of Finkelstein (2003), mentioned that *symbols* "are storehouses of information about the major structural values of a culture". Dandridge et al., (1980) also argue that *organizational symbols* act as expressions of an organization's and its members' experiences. Symbols are the mechanisms through which organizations enact the meaning associated with them. They constitute the conveyance for shared frame of reference which characterizes the organizations and directs the organizational members' sensemaking, cognitive structures of interpretation and action references (Pratt and Rafaeli, 1997). Along with some specific areas of organizational life such as stories, architecture, social activities, gatherings, parties, jokes or verbal expressions neglected by the functionalist positivist organization theory, actions, strategies, formal structures, plans and business concepts are also regarded as including some symbolic dimension. The symbolic dimensions encapsulated within all aspects of organizational life are anchored through the shared meanings of the collective character of organization (Alvesson, 1991).

Organizational life and knowledge is mediated by the symbols and these symbols construct the organization itself. There are three characteristics of organizational symbols. They are briefly summarized below.

The construction of symbols is a collective action involving the groups and organizations. The symbol represents the meaning of an object which allows the recognition of what is already known. Symbols indeed trace the relationship between two subjects; one is the sender (i.e. the message aimed to be sent thorough the symbol) and the other is the receiver (i.e. the receiver of the message by the symbol).

Nonetheless the two halves of the whole need to be combined and the unitary meaning restored (Strati, 1998).

The perception and understanding of symbols are based on negotiated interpretation of specific organizational codes. The interweaving of socio-cultural elements, personality and the social system implies that the socio-psychological tensions are expressed in symbolic form. Hence thought is not a private act that takes place within the closed loop thinking frames of individuals but it is rather a social activity. Thought and the construction of meaning is a negotiation running between the symbolic universes embraced to comprehend the ongoing organizational phenomena (Strati, 1995).

The individuation of specific organizational symbols occurs through its practical usage. Symbols cannot come into existence unless it is generated, manifested, used, recalled, reconfigured and specified. These processes make the symbol observable and comprehendible. This characteristic of symbols make it acknowledgeable that every human action (i.e. organizational members' actions and behaviors) hold some sort of symbolic aspect and is related to other actions and practices (Strati, 1995).

Besides, other than the key characteristics of organizational symbols, some theorists focus on the examining of how symbols are categorized and function in the organizational context. However this effort to categorize symbols does not exceed the sole theoretical endeavor and yet lacks empirical rigor (Strati, 1995).

3.4. Functions and Types of Organizational Symbols

Organizational symbols are manifested by organizational members to reveal, reflect and make visible the unconscious thoughts, feelings, images and values that are deep-rooted within organizational settings (Dandridge et al., 1980). They function as the primary meaning making, meaning communicating and meaning negotiating devices within the organizations. However organization theorists most often concentrated on the objective aspects of the organizations as if observable data are enough for the explanation of the organizational phenomena and behavior. But symbols and symbolic action are particularly important in the understanding of the organizational life as suggested by many of organization theorists (Dandridge et al., 1980; Pratt and Rafaeli, 2001; Finkelstein, 2003; Cornelissen, 2005; Boje, 2001).

Understanding how organizational symbols function may provide insightful account on how they become legitimate and leverage organizational phenomena (Vaughn, 1995). Symbols serve as the unique social indicators; they are the foci of social values, and they unveil the hidden, unconscious knowledge within the organizational layers (Symbols embed the underlying character, the thought system, value propositions, cognitive schemata sui generis and the hidden layers of meaning inherent in all human forms of organization.

Dandridge et al. (1980) argue that organizational symbols reveal an organization's feelings, images and values. These symbols can be the stories and myths, the ceremonial and ritualized events, the logo of an organization, as well as its anecdotes and jokes. There are different ways to categorize symbols but based on their characteristics. Vaughn (1995) categorizes organizational symbols into four; (1) stories, (2) ritualized events, (3) specialized language and (4) material manifestations. *Stories* are regarded as narratives based on true events and often combining rational (e.g. truth), and non-rational (e.g. fictional) elements. *Ritualized events* comprise of rituals, rites and ceremonies which indicate the patterns that are consistently repeated and that are formalized. *Specialized language* is the jargon, slogans, phrases and metaphors which are utilized to communicate the tacit organizational aspects such as values, ideology, beliefs and emotions of the organization. Lastly *material manifestations* refer to the logos, badges, awards, physical settings and company products which manifest the prevailing character of the organization.

Another categorization is that of Trice and Beyer (1993) suggesting that there are three types of symbols specific to organizational culture; (1) objects, (2) settings and (3) performers. *Object symbols* are the physical symbols which are the context specific. The meaning expressed through the physical symbols is dependent on a particular context. Physical symbols correspond to the material symbols indicated by Vaughn (1995). For instance a company logo can be considered a physical symbol. *Setting symbols* indicate the physical setting of the organization. Every manifestation of the physical setting; physical, online or printed is considered the settings symbol, and constitutes symbolic aspects of the organization. Finally *performers* are the representatives, organizational members who through their actions, decision ar behaviors generate and communicate deeper meanings (Trice and Beyer, 1993).

One of the most influential categorizations of organizational symbols is revealed in the study by Dandridge et al. (1980). Specifically, Dandridge et al., (1980), categorized symbols as; (1) verbal - myth, stories, language, legend and jokes; (2) actions - repetitious rituals and routines; and (3) material symbols, which include logos, awards, and company products. According to these authors, *verbal symbols* serve as information carrying devices, enhance the communication and reinforcement processes, and help people to imagine and interpret their surroundings in the organizations (Hill and Levenhagen, 1995; Hopkinson, 2003). They can be manifested in the form of myths, legends, stories, slogans, creeds, jokes, rumors or names. *Action symbols* instead express the unconscious and hidden rules, procedures and habits throughout the organization. Action symbols can be rituals, special acts, repeating or non-repeating ceremonies, parties, rites of passages, meals and informal mechanisms which maintain the system functioning, control the intentions, thoughts, knowledge frameworks and actions of organizational members, and provide frames of reference by explicating past experiences. Action symbols transmit the inherent rules, values and habits within the organization (Dandridge et al., 1980). *Material symbols* represent the physical construction of the events or situations within the organization. The logo, company products, status symbols, awards, company badges, pins or flags constitute the material symbols of the organization. Material symbols externalize the hidden meaning of distinct aspect or the whole organization which enforces a symbolic, visible and concrete image.

Specifically the different types of organizational symbols act in three different ways within the working environment. Firstly, symbols enable the expressions of employees' experiences. Secondly, symbols not only translate and transmit successful actions or situations but also the less inspirational or non-motivating components within the work setting. Hence they generate both new ways of thinking and looking as well as a reference frame that carries meanings from past experiences. Thirdly, symbols act as guidelines of stability or change for all staff (Lamproulis, 2007).

This thesis focused mainly on the verbal symbols within the organizations encapsulating the stories (i.e. process-based stories, and relationship-based stories), metaphors (i.e. generative metaphors and heuristic metaphors) and common language developed. Verbal symbols encapsulate the hidden messages, deep-rooted values systems, unconscious ideologies and interests within organizational members and

overall the commonsensical character of the organization. They generate and diffuse tacit knowledge and develop new ways of making inference regarding organizational phenomena. Verbal symbols drive both the construction and the communication of knowledge. Their unique function within the organization is that they establish necessary platforms to comprehend, see, and imagine reciprocally as well as generating new ways of seeing and new ways of acting (Gherardi, 2000).

Particularly; (1) the stories and narratives the organization deliberately envisions, unconsciously contrives and collectively selects as representing the important aspects of the processes and relationships inherent within the organization; (2) the metaphors elaborating the consensual definition out of experiences, problems and solutions, socially ascribe meanings, infuse a shared understanding to verbal (e.g. words, slogans) or physical elements (e.g. logos, flags, awards), and (3) the common language developed within the organization as showing the day-to-day affective, social, descriptive and procedural life of the organization reveal the inter-subjective experiences, help to negotiate a complex bundle of conflicting meanings and associated interpretive frameworks.

The functions associated with organizational symbols can be categorized into three as originally compiled by Dandridge et al., (1980). These are;

1. **Descriptive:** acting as shorthand to convey the direct experience of a work situation and the associated feelings. The phrase "a picture is worth a thousand words" is analogous to the function a symbol can serve for description.
2. **Framing:** The second function of symbols is energy controlling, to the extent that individuals are inspired or demotivated through the impact of the symbol.
3. **Maintaining the order:** The third function of symbols is that of system maintenance. Here the patterning or stability of the system is justified or reinforced through the various symbol types.

3.4.1. Stories, Metaphors and Common Language

As the main foci of organizational symbolist studies, the examination of *stories, metaphors* and *common language* aim at exploring, gaining deep, subtle and sophisticated view of the organizational life. These elements, their generation, negotiation and use make the organizational domain a symbolic habitat where

everyday activities of organizational life define the boundaries of social patterning (Strati, 1998). At this point it would be illustrative to describe the particular types of symbols considered in this thesis.

Stories are a collection of narrative elements representing events, involved actors and their contextual setting causally linked to each other (Elliott, 2005; Makkonen et al., 2012; Bartel and Garud, 2009). The storytelling literature suggests that each story should conclude with a lesson learned or a defining moment (Brown et al., 2009). Consistent with Berry (2001, p. 59), "a story is defined as explanations offered by respondents to explain firm processes or relationships".

The *narrative elements* involved in a story are; (1) activities, (2) events, (3) actors, (4) motives and (5) the scene surrounding their occurrence. Organizational stories can be based on the processes or the relationships taking place throughout the organization which form a chain of interdependent events elucidated into a meaningful whole. The meaningful whole structured in a temporal order having a start and an end within the story enables the organizational members to act upon the seemingly resonating emergent phenomena with the past experiences and situations (Boje, 2001). According to Boje (1995) stories and storytelling is a form of reality construction however when regarded from a postmodern perspective reveals that the plurivocality, alternative stories and the voices of the less powerful are excluded or silenced. This shows the strength of stories in term of constructing a commonality of meaning networks that is the meaning of events and knowledge presented outside is evaluated/regarded from a common cognitive framework particularly the stories' stance (Boje, 2001).

According to Bartel and Garud (2009) stories have three basic functions which enable them to serve as the unconscious knowledge translating mechanisms. These are shown as follows;

1. Stories enable people to translate ideas across different parts of the organization in a manner that allows them to generate new inferences and applications for their own work.
2. Stories enable people to translate emergent situations that are ambiguous or equivocal so as to promote real-time problem solving.
3. Stories enable people to translate ideas accumulated from particular instances of past innovation to inform current and future efforts throughout the organization.

The interest on how unconscious aspects of organizational life build the organizations and organizational phenomena has led to the accelerated research inquiry to the study of metaphors under the umbrella field of organizational symbolism. As cited in the research of Jacobs and Heracleous (2006) according to Burke (1992), metaphors can be “windows into the soul [of the organization], if not to the collective unconscious, of the social system”. However organizational research is falling short in offering an in-depth investigation of the respectively more abstract concept of organizational symbols in general and organizational metaphors in particular. Metaphors constitute the essential aspects of organizational members cognitive frameworks which provide the mechanisms through which they see and construct the organizational life. Organizational members' implicit evaluations and the way they act upon these evaluation is dependent on the metaphors which reveal the hidden if not unconscious knowledge within the organization.

Metaphors are constructed as the representations of understanding one thing in terms of another which requires the consolidation of two concepts and even the distinct domains which the two concepts belong to. Metaphor construction hence requires the mapping from the domain of the source concept to the target and its respective distinct domain mobilizing its features and attributes (Lakoff and Johnson, 1980).

By following Gherardi (2000), this thesis adapts two types of interrelated metaphors, explicitly; *generative* and *heuristic metaphors*. *Generative metaphors* are related to the act of reframing or discovering and creating new possibilities for actions that people had not previously considered. They are the means to generate new knowledge internally. Generative metaphors enable the reframing and discovery of knowledge and the creation of new horizons of insight. *Heuristic metaphors* are related to accessing a more complex and reciprocal understanding, sense-making, communication, and conversion of tacit knowledge into explicit knowledge. Heuristic metaphors offer alternative ways to look at and comprehend the organizational phenomena. They act as carriers of meaning which shape the imagination of situation in partial ways (Gherardi, 2000). Indeed they are associated with ways of imagination as offered by Karl Weick's concept of disciplined imagination in constructing knowledge and theories about organizations.

The use of metaphors influence the ways that element represented by the metaphor is thought of, perceived, treated and acted upon. For instance, the metaphor

“time is money” influences how English speakers think and speak of time. The statements such as “to save time”, “to spend your time” are an outcome of the metaphor used to represent time (i.e. money) and infuse unconscious meanings to it as something to be spent or saved (Pratt and Rafaeli, 2001). Metaphors are suggested to have important roles in organization regarding the understanding, evaluation, diffusion of knowledge explicitly; (1) knowledge transmission, (2) knowledge variation, (3) establishment of alternative frames of reference (Cornelissen, 2005, p. 753).

Metaphors are the means for tacit knowledge transmission. Metaphors serve to elaborate what alternative, literal expressions are not able to transmit throughout the organization, providing organizational members with a vocabulary they can use to express, systematize, interpret and comprehend a particular complex, ambigous and abstract organizational phenomenon (Weick, 1989). Such phenomena (including the many social practices and mental activities that take place within an organizational context) raise the utility of plausible, inexact reasoning, including metaphorical reasoning, as more precise inference is unmanageable or not yet possible. Thus, abstract or complex knowledge of organizational life both internally or externally generated, can be transferred through metaphors. Indeed metaphors load deeper meanings, values and characteristics of social identities to concrete concepts which promote the understanding of the particular phenomenon and its linkage to the idea. The use of metaphors pursues a process which “allows us to refer to it, quantify it, identify a particular aspect of it . . . and perhaps even believe that we understand it” (Lakoff and Johnson, 1980: 26).

Metaphors provide the richness and variation among knowledge bases. Metaphors serve as the sources of plurivocality within the organizations. Metaphors evoke a plurality and openness of meaning which is referred to as interpretive viability, that has advantages over standard so-called literal language, which, being fixed in a particular coding system, limits interpretation and, thus, is both constrained and constraining (Van Maanen, 1995). Forceful metaphors in organizational theory building are not rigidly constrained to one sense or a single interpretation but, rather, have a heuristic quality in opening up new and multiple ways of seeing, conceptualizing, and understanding organizational phenomena.

Metaphors provide organizational members with alternative frames of reference. Metaphors have positive semantic qualities that grant them the role of

developing imaginative thought trials, mental experiments and iterative ways of seeing, sensing, conceptualizing and comprehending organizational phenomena (Cornelissen, 2005). Therefore metaphors once established become irreducible to non-metaphorical verbal representations or the use of direct language. Especially, the sensory and imaginative qualities of metaphors, which empower them with generative, memory and imagination and projective form, enable organizational members to view organizational phenomena through new lenses (Bartel and Garud, 2009). They draw both on past lived experiences, and current life-position which activates the existing cognitive schemes as well as projective imagination (Weick, 1995). Indeed metaphors involve looking back retrospectively and the future prospectively to enable the recognition of conceptual distinctions as well as similarities that was inconceivable before.

Common language refers to "..the discursive and cognitive representations engaged in a dynamic process of reciprocal influence" which function as a symbolic way of communication as well as representation. It is also referred to as "lingua franca" or "shared language" in several research streams such as organizational communication addressing to the integration of the linguistic elements of the interacting organizational members. Common language is mostly acknowledged to be and administrative managerial tool which establishes a platform through which members of the organization within or outside the physical boundaries to communicate even though the operations they run, knowledge they acquire and utilize or the goals they pursue differ substantially (Fredriksson et al., 2006). Common language is recognized as an essential tool to infer and influence the cognitive frameworks of organizational members, comprehend the relational network across the organization, establish social cohesion and collectively interpret organizational life. Indeed common language is a way of symbolic integration among organizational members and managers. What common language does not indicate is that it is an all-pervading language utilized throughout the organization at all levels, rather it invokes the shared idiom or the shared way of associating organizational meanings engaged with particular situations (Pratt and Rafaeli, 2001).

Common language is based on some consensual and meaningful arrangements of individual elements. It can be of verbal, physical and artifactual nature meaning that not only combinations of letters, words, sentences but also, gestures, moves, facial expressions which render the complex organizational contexts

intelligible among the organizational members are considered common language. Common language is deeply rooted within the "inherent psyche" of the organization which is a shared and enduring mode of explanation enabling the reciprocal understanding between the organizational members. It eliminates the uncertainty and helps to cope with the unknown elements within and outside the organization by setting a common ground of comprehension (Dandridge et al., 1980).

Particularly common language has two functions which leverage the smooth functioning of daily routines within the organization. The first is c*ommunication* and the second is *representation* (Cossette, 1998). The communication function relates to the *functional* and *relational* roles of common language. *Functional role* is the inquiry, interrogation, exchange of knowledge in order to transmit the meaning associated with the elements of the common language. *Relational role* of the common language can be recognized through the rituals and ceremonies within the organization. They set the necessary interpersonal cohesion for the endurance of organizational order (Cossette, 1998). Dandridge et al., define this function as the system maintenance function of organizational symbols. Specifically common language serves as the *system maintenance device* through giving "reason", providing coherence, stability and integration.

The other function embodied within organizational common language is representation which is also considered as the cognitive function. Through the *representation function*, common language employs a variety of symbols to generate and activate both explicit and tacit knowledge which is hidden in the collective schemata for comprehending and interpreting organizational phenomena (Cossette, 1998). Indeed, organizational members form a shared framework and representation of the organizational life internal or external to the organization which equalizes the meanings communicated between the members (Kleinsmann et al., 2010). The representation/cognitive function of common language also allows organizational members to become aware of their and organization's thoughts. Karl Weick explains this through the influential question in interpretive organizational science; "How can I know what I think until I see what I say?" Organizational members through developing and using a common language transform their collectively held knowledge, values and thoughts to systematic and simple representations.

Common language facilitate the creation of a shared understanding through setting homogeneous language between actors, enabling the transformation of

knowledge and facilitating and systematizing information (Makkonen et al., 2012). Indeed it has three critical aspects which empower common language to serve as organizational symbols that generate, transfer, negotiate and represent knowledge. The first is that common language possesses an assumed and expected grammar. There is a conventional pattern of elements which are sequentially or reciprocally integrated to form a meaningful an coherent understanding. These conventional patterns constitute the rules and norms are acknowledged at an unconscious level and enables the mutual comprehension (Pratt and Rafaeli, 2001). The second aspect of common language is its socially constructed nature.

Common language is developed within a social group (e.g. organization) by the infusion of symbolic meanings to the associated elements. Hence the meaning associated with linguistic elements appear to be socially constructed and shared. This social construction is a routinely held activity across organizational members often automatically conducted. Third, the network of shared and relational meanings anchored through the common language has a dynamic character. The meaning construction through organizational members associated with the common language is an ongoing process which eventually constructs organizations and organizational phenomena. How organizational members see and interpret the enacted organizational setting is dependent on the common language developed (Pratt and Rafaeli, 2001).

Building on this background of organizational symbols, explicitly; stories, metaphors and common language, the rationale behind the research inquiry concerning this thesis of relating the unconsciously held knowledge, inherent values, assumptions and thoughts, anchored in the shared meanings of the organizational collective having an intersubjective character with the ability to acquire, assimilate, transform and utilize externally generated knowledge can be given attention to.

3.5. The Rationale Behind Hypotheses Development Organizational Symbols as Unconscious Knowledge Repositories

A review of the pertinent literature shows that "the key antecedents of absorptive capacity itself have not received much attention, in particular intra-organizational antecedents" (Volberda et al., 2010, p.932). Cohen and Levinthal (1990) in their seminal work on absorptive capacity stress the importance of prior related knowledge in the organizational context to be able to assimilate and utilize new knowledge. Yet, being merely exposed to the external knowledge is not satisfactory for firms to be able to recognize its value (Escribano et al., 2009), but an organizational cross-functional mechanism to ensure the retention and accessibility of inherent meaning, character, values, feelings and emotions within the organization (Cepeda-Carrion et al., forthcoming) that allow multiple organizational members to recognize, understand, communicate, interpret, assimilate, apply and exploit diverse knowledge, is required (Harrington and Guimares, 2005). The patterned activities of organizational members result in organizational symbols which illustrates the organization's character and its worldview. These patterned activities represent the symbolic actions within organizations and collectively conforms the symbolic capacity of organizations.

Organizations are by their very nature considered symbolic entities which embody the processes of meaning generation, negotiation and conveyance through the symbolic processes in order to maintain the necessary order of organizational phenomena. All organizational phenomena or what organization theorists refer to as organizational realities including absorptive capacity meaning the internal capability of firms to absorb external knowledge should be thought of intertwined with the symbolic domain and symbolic activities of the organization (Weir and Hutchings, 2005). Indeed, organizational researchers argue that symbols have significant linkage with organizational outcomes such as effective management, socialization of organizational members, social cohesion, increased work satisfaction, maintenance of appropriate behavior, organizational image and identification, organizational learning, network processes (Alvesson, 1991; Vaughn, 1995; Makkonen et al., 2012; Feiereisen et al., 2008).

Particularly stories and metaphors are suggested to guide the imagination and evaluation of new product concepts, transfer of tacit knowledge from within the organization into the NPD projects and teams, provide valuable market information/knowledge from the external of the organization which leverage the NPD process (Van Den Hende and Schoormans, 2012; Goffin and Koners, 2011). Researchers also recognize the need to theoretically and empirically articulate the relationship between organizational issues and the role of symbols namely; stories (i.e. process-based and relationship-based stories), metaphors (i.e. generative and heuristic metaphors), and common language (Vaughn, 1995; Pratt and Rafaeli, 2001).

However although theoretical research on the role of organizational symbols have been contemplated, literature falls short of empirical work which investigates the significance of organizational symbols in organizational issues such as absorptive capacity and NPD. Limited attention have been paid to the symbolic activities and symbols' role in the absorptive capacity literature. Particularly researchers indicate that "If organizational scholars have reached a consensus that symbols play a significant role in organizational life then it is important to conduct studies that use actual data as evidence for the arguments" (Vaughn, 1995, p. 221). The empirical investigation of stories, metaphors and common language will provide theorists and practitioners with a better understanding of how tacit knowledge, unconsciously embedded values, feelings and emotions, inherent ideology and meanings within the organization is generated, communicated and accordingly results in organizational outcomes such as NPD.

Researchers increasingly suggest that absorptive capacity is a dynamic construct evolving through learning which depends on past experiences (Gebauer et al., 2012). Thus, recent evidence shows that existing stock of knowledge embedded in organization's products, processes, and people (Cohen and Levinthal, 1990; Ernst et al., 2011; Harrington and Guimares, 2005; Jiménez-Barrionuevo et al., 2011; Todorova and Durisin, 2007; Van Den Bosch et al, 2003; Zahra and George, 2002) manifested through the organizational artifacts which retain the unconscious knowledge, values, meanings, thoughts, emotions and perceptions of the organization (Turner, 1986; Pratt and Rafaeli, 2001) facilitate the evaluation, interpretation, transformation, utilization and accordingly the absorption of new external knowledge (Jiménez-Barrionuevo et al., 2011; Chou et al., 2007). Indeed organizational symbols

which are the organizational artifacts, standing for or suggesting something else (other than itself) through establishing a causality of relationship, association, convention or accidental resemblance (Pratt and Rafaeli, 2001), constitute a deep stock of tacit knowledge, values, thoughts and emotions of the organization driving the external knowledge absorption (Lamproulis, 2007).

As empirical studies demonstrate that innovative firms tend to achieve higher profitability, increased value in the market, greater survival rates and sustainable competitive advantage, in order to capture these benefits firms have begun to increasingly rely on internal capacity to absorb external knowledge for heightened innovativeness. The ability of firms to recognize, acquire and utilize external knowledge is suggested to foster firm innovativeness since the seminal work of Cohen and Levinthal (1989). However the collective understanding in the literature on the realization of absorptive capacity based on the internal mechanisms of symbolic action and thought is limited. The unconsciously held knowledge, anchored in the shared meanings of the organizational collective of an intersubjective character drives the organization to actualize outside new knowledge which is valuable for its survival and renewal. Indeed, absorptive capacity calls for renewed interest specifically through three main avenues which this thesis aims to rigorously explore. Through the hypothesis development based on the proposed theoretical background it is aimed to empirically investigate the missing aspects within organizational symbols, absorptive capacity and NPD context in order to enrich the absorptive capacity research domain and contribute to its development.

First, absorptive capacity has been treated as a concrete, uni-dimensional proxy targeting R&D context. Explicitly, the cumulative and simultaneous effect of absorptive capacity variables namely; acquisition, assimilation, transformation, and utilization have been rarely analyzed empirically in relation to firm product innovativeness in the new product development (NPD) literature.

Second, absorptive capacity is commonly regarded as an independent variable ignoring how it can be promoted through other organizational mechanisms as the antecedents. Theories of absorptive capacity have anticipated that firms' existing knowledge bases facilitate the external knowledge absorption. However, absorptive capacity is mainly considered to be related with prior R&D based knowledge, neglecting hidden, tacit knowledge, values and meanings embedded within

organizational symbols. Indeed organizational symbolism and symbols have important premises for the absorptive capacity literature.

Third, although absorptive capacity has been acknowledged to leverage firm innovativeness in a variety of contexts, relatively few studies distinguished between different types of innovation, particularly focusing on the relationship between absorptive capacity and product innovativeness.

Fourth, acknowledging the relationship between absorptive capacity and product innovativeness, the empirical examination of the link between organizational symbols and product innovativeness highlights the mediating role of absorptive capacity in the relationship between organizational symbols as unconscious knowledge manifestation and the product innovativeness.

Fifth, although absorptive capacity is being enabled by the interlinkage between the internal and external environment, while embodied values, assumptions and artifacts expressed through the symbols generating a fertile environment for the imagination, new knowledge generation and transmission, the external environment have an important role in the establishment of absorptive capacity. Environmental conditions indicate different levels of absorptive capacity. Particularly the extent to which environmental uncertainty affects the relationship between organizational symbols and absorptive capacity is missing. This thesis also empirically investigates the role of environmental uncertainty in moderating absorptive capacity.

4. HYPOTHESES DEVELOPMENT AND CONCEPTUAL FRAMEWORK

4.1. Organizational Symbols and Absorptive Capacity

I argue that the use of organizational stories representing the oral history of an organization's processes (e.g., product development efforts, strategy implementations, knowledge management) and relationships (e.g.,interactions and relationship with customers, competitors, other firms) (Berry, 2001), throughout the organization, influences the firm's absorptive capacity. Specifically, organizational process or relationships related stories act as filtering and sorting vehicles or templates and create a common context for recognizing the causal pathways transmitting the intended messages of the external knowledge from outside. This allows people to acquire, disseminate, and use external knowledge (Makkoken et al., 2012).

The verbal representations in the form of stories regarding processes and relationships of the organization which provide an experienced expression of the organizational phenomena (Dandridge et al., 1980), leverages the firm's capacity to value, identify, acquire, assimilate, transform and apply new external knowledge (i.e., absorptive capacity) by structuring peoples' experiences. For instance, an organization's past market and technology related stories enable people to reconcile current experiences and behaviors with preexisting beliefs, and by doing so, they enable people to capture, codify, and validate the external information; and structure and stabilize the unknown information to reduce equivocality (Weick, 1995).

Stories constitute a platform through which effective sensemaking takes place. They provide an account for the ways in which an event is related to another under specific conditions, equivalently facilitates the understanding of the ways in which existing knowledge relates to the external knowledge (Elliott, 2005). Accordingly stories provide a medium to understand, convey and remember the meaning, importance and relevance of the knowledge outside the firm through generating a holistic description and causal pathways between the narrative elements of the events, actors and context outside the firm and the internal knowledge base echoing through the organizational process-based and relationship-based stories. In this way,

the organizational stories act as filtering and sorting vehicles and templates, and create a common context that allows people to (1) subjectively perceive and give meaning to outside knowledge, (2) capture, codify and validate the external information and reconcile with existing experiences, and (3) generate linkages between external and internal narrative elements of actors, events and contexts, leading to the acquisition, dissemination, integration and application of external information/knowledge (Boje, 1991).

The use of organizational stories helps people to build consensus and to discover hidden details that can bear a significant contribution when valuing and identifying external information, knowledge and events. For instance, the literature indicates that a “story” is a natural way to transmit and share knowledge and can be successfully used in other contexts to make knowledge explicit (Erden et al., 2008). The development of organizational stories enforces the effective coordination of knowledge within the organization through bringing together the diverse knowledge bases embodied within organizational members in a resonating whole. They uncover the hidden and even unconscious elements of organizational members’ knowledge, bridge perceptual and practical variations between cognitive schemes of individuals and allow recombining multiple knowledge interests (i.e. technical, practical, emancipatory) (Habermas, 1972). The knowledge and idea recombination among organizational members result in collective intentionality towards evaluating external knowledge, converging knowledge interests and utilizing common frames of reference towards acquiring and assimilating externally generated knowledge (Lamproulis, 2007).

Further, the use of organizational stories clarifies and stirs people’s imagination on the external information that improves a firm’s absorptive capacity (Van den Hende et al., 2012; Vanharanta and Easton, 2010). Such that telling a story is an easy way to explain things informally and “engages people in conversation who collectively strive to arrive at an interpretation that provides closure" (Robichaud et al., 2004, p. 631). Stories easily capture the fragments of actions and experiences without clear plots and bind the chain of actions where the actors and other structural or contextual elements are involved into a meaningful unity. Hence stories establish a resonating common sense of order which enable organizational members to translate knowledge from external sources to generate novel inferences and implications for their own work (Bartel and Garud, 2009). For instance, when stories about the firm’s

past technology-related information are exchanged and shared among people in the organization, people mutually re-establish and tailor those stories to assess and anticipate external technology-related information (Hernández-Serrano et al., 2002). Therefore, the following hypotheses are formulated:

H1a: The use of process related organizational stories is positively related to the absorptive capacity of organizations.

H1b: The use of relationships related organizational stories is positively related to the absorptive capacity of organizations.

The use of metaphors, which are defined as "the understanding of one kind of thing in terms of another" (Lakoff and Johnson, 1980, p. 5) through a single word, phrase, or visual symbol or object (Barner, 2008), in general, *and generative and heuristic metaphors* in particular (Gherardi, 2000), influence the firm's absorptive capacity. Specifically, the use of *generative or heuristic metaphors* influences the firm's absorptive capacity by interconnecting a broad array of interrelated thoughts, knowledge, feelings, and beliefs (Feiereisen et al., 2008). This is of particular interest since metaphors "serve as the common medium for diagnosing and addressing theories-in-use, cultural assumptions and beliefs, and unconscious dynamics" (Marshak, 1998, p. 151) and "provide a compact version of an event without having to spell out detail and enable people to portray ideas which are emotionally, sensibly and cognitively vivid" (Wilson, 1992, p. 883). For instance, metaphors expressed in the form of a logo, slogan, flag, award, ritual, dress code, physical landscape or architecture, wall hangings, diplomas have the potential to psychologically engage in respectively abstract and intangible ideas, values and contexts.

Specifically it is easier to think and discuss about a visible, observed or sensed phenomenon than to think, communicate and act upon organizational value systems or individual's identities (Pratt and Rafaeli, 2001). Metaphors in this regard describe and provide a holistic account of the existing tacit knowledge to be compared to the external information/knowledge in terms of similarities and overlapping ground (Denyer and Tranfield, 2006). They help to explicate the discrete properties or relations between the internal and external new knowledge, determine the conditions

that can be applied to both or find the features that are salient and not visible by mere encountering (Cornelissen, 2005).

The use of *generative and heuristic metaphors helps to* convey meaning regarding a complex event or process and enables organizational members to cope with external information-related confusion and ambiguity (Seidel, 2007). For example, throughout a metaphoric transfer, people translate external events and information into a series of understandable and meaningful images (Goffin and Koners, 2011), recognize motives, issues, and concerns that lie beneath the surface of external information/knowledge (Hill and Levenhagen, 1995) and then communicate these understandings to others effectively (Nonaka, 1994). Metaphors in this context serve as information carrying devices that transmit both technical and expressive meanings and are thus useful in the communication and reinforcement process (Armenakis et al., 1996).

In addition, through the use of metaphors the newcomers are taught an organization-specific expression pattern that eases the comprehension of background knowledge and enhances communication with others (Jansen et al., 2005). In this way, socialization tactics enhance the combination of newly acquired and existing knowledge through facilitating bisociation among unit members (Zahra and George, 2002). Hence, metaphors provide a means for understanding situations, ideas and knowledge presented externally which were previously seeming incompatible with the existing cognitive frames of reference.

The generative and heuristic metaphors articulate experiences which otherwise cannot be expressed or mobilized, represent the organizational life in a suggestive manner rather than declarative. Particularly, the heuristic metaphors generate images illustrating an event or structure and in time these images become taken for granted so that they dominate and hide the prefiguring event/structure (Cornelissen, 2005; Weick, 1989). Subsequently this image generated by the metaphor becomes a heuristic through which organizational members make further inquiries regarding the newly encountered complex or ambiguous knowledge. Accordingly the external knowledge can be more easily comprehended and interpreted leveraging its acquisition and assimilation with existing cognitive structures of the organization. Besides, metaphors can also have a generative quality where they drive the development of a rich cascade of representations and imaginations regarding the considered organizational phenomenon. Generative metaphors serve as the devices

that enable the "generation" of new perspectives on the organizational world, signal new directions of thought, new ways of understanding which facilitate the transformation of the cognitive structures within the organization to accommodate newly acquired knowledge from the outside (Cornelissen, 2005).

Therefore, it is hypothesized that:

H2a: The use of generative metaphors is positively related to the absorptive capacity of organizations.

H2b: The use of heuristic metaphors is positively related to the absorptive capacity of organizations.

Developing a common language (e.g., jargon or lingua franca) is another factor that enhances the absorptive capacity of organizations. Specifically, developing a common language; (1) helps people to unify their different thought worlds (Kleinsmann et al., 2010), (2) reduces the communication barriers in terms of different interpretations of explicit and implicit messages (Makkonen, et al., 2012), and (3) fuels the social relations, "for it is the means by which people discuss and exchange information, ask questions and provide opinions" (Chua, 2002, p. 378). In this way, people acquire, share, and utilize external information/knowledge effectively.

Common language is produced in reciprocal social interaction situations and drives the formation of a social identity which fosters the recognition and selection of knowledge to be absorbed. The social identity constitutes the subjective aspect of the identity and establishes a way through which the organizational members represent themselves throughout the social interaction (Elkjaer ve Simpson, 2011). Besides the self identity of organizational members which is the objective identity formed regarding one's self, the social identity underlies the perception one has regarding how other members within the organization sees him/her. Also allows locating him/herself within the organization according to the common values and beliefs expressed through a shared language.

Social identity provides a framework of thought and action according to the social interaction within the organization or with the outside of the organization, taking place (Cossette, 1998). Hence the social identity developed through the shared meanings ascribed to statements of the common language, provides guidance for

acting in response to the other organizational members or acting upon the external environment with the other organizational members collectively. Common language in turn, drives the piecemeal transformation of the cognitive structures of the organizational members through the formation of social identities and acting upon those social identities. Accordingly, it helps to accommodate the existing knowledge and knowing schemata to the externally acquired and assimilated knowledge (Pratt and Rafaeli, 2001; Fosfuri and Tribó, 2008).

Also, developing a common language in organizations provides a frame of reference for observing and interpreting the external information/knowledge and provides a common conceptual apparatus for evaluating the likely benefits of the created knowledge (Zahay et al., 2004). Establishing a common language allows people to categorize their experiences and assign meaning to those experiences, not only for themselves, but also for those with whom they communicate and co-ordinate their actions in the resolution of the problems that they confront during the external information acquisition, transmission and usage processes (Hall and Johnson, 2009). In particular a shared language brings about internal mechanisms for knowledge integration and common interpretation leveraging the recognition and assimilation of the externally generated knowledge. For instance, Camisón and Forés (2011) note that a common language gives the firm a more comprehensive understanding of the new information it receives, increasing its ability to scan and discover more and better ideas and valuable tacit knowledge in the environment and to access and select external opportunities more efficiently and faster. Therefore it is hypothesized that:

H3: Developing a common language is positively related to the development of absorptive capacity of organizations.

4.2. Absorptive Capacity and Product Innovativeness

Product innovativeness is usually defined as the level of perceived newness, originality, and uniqueness of a product (Song and Montoya-Weiss, 1998; Garcia and Calatone, 2002; Griffin, 2002; Sethi and Nicholson, 2001; Jordan and Segelod, 2006; Langerak and Hultink, 2006). In this study, the product innovativeness conceptualization and operationalization of Wang and Ahmed (2004) are adopted where the product innovativeness is scaled as part of an overall organizational

innovativeness, and the propensity of a firm to innovate or develop new products that meet and/or exceed customers expectations in a timely fashion as reflected in its uniqueness in comparison to similar products offered in the market. This view of product innovativeness implies that the firm has learnt to do something, and distinguishes the different sub-forms of organizational innovativeness, such as market, behavioral, process, strategic. Especially, according to Wang and Ahmed (2004) two perspectives of product innovativeness, involving customers' perspective (characteristics such as innovation attributes, adoption risks, and levels of change in established behavioral patterns), and firm's perspective (environmental familiarity and project-firm fit, and technological and marketing aspects) (Danneels and Kleinschmidt, 2001), cover market, behavioral, strategic and process innovativeness without regarding the product innovativeness as a salient dimension.

Especially, the scholars argued that through absorptive capacity, firms leverage their product innovativeness by; 1) establishing collaborative networks with external actors;2) being aware of and identifying the new technological trends and knowledge (Nieto and Quevedo, 2005; Pandza and Holt, 2007; Haro-Dominguez et al., 2007), 3) realizing the similarities between external knowledge and their existing knowledge base, (Abecassis-Moedas and Mahmoud-Jouini, 2008; Lane et al., 2001), and 4) unifying technological knowledge in their outside environments with their internal functions, strategy development and decision making (Murovec and Prodan, 2009; Müller-Seitz, 2012).

In this thesis I contend that absorptive capacity is positively related to new product development efforts by aiding in developing closer external relationships and cooperation with customers, suppliers, dealers, and even competitors (Murovec and Prodan, 2009). This is such that, greater involvement in the relationships with external partners increases the breadth and depth of information which firms have access to (Murovec and Prodan, 2009), eliminates the risk of being trapped in myopia or rigidities through enabling access to a wider set of knowledge (Pandza and Holt, 2007), thus it promotes effective NPD (Stock et al., 2001). For instance, it is important for firms to build a network of collaborative connections with external actors, such as customers, suppliers, dealers, and even competitors, which allow firms to gain control in the search and selective permeability of knowledge into organizational boundaries (Chen et al., 2009). The recognition and absorption of new and related external knowledge, generates motivations which lead organizations to

set continuous relationships with their external network partners, and establish technological cooperation agreements (Koch and Strotmann, 2008; Murovec and Prodan, 2009). Here, reliable, fast and qualified knowledge sharing among the relationship network allows firms to effectively organize and alleviate resources that are targeted to specific customer needs and wants, stimulating product innovation process (Chen et al., 2009). Specifically Nieto and Quevedo (2005) assert that absorptive capacity generates an awareness of the recent technological and scientific advancements cooperate with external parties and provide the ability to benefit from the pool of technological opportunities. Indeed, accumulation of technological knowledge, improvement of technical skills and expertise leverage firm product innovativeness (Haro-Dominguez et al., 2007; Tsai et al., 2011).

Next, absorptive capacity allows firms to borrow and exploit outside knowledge that may not be ready to use for innovation process, but which constitutes the basis for subsequent R&D (Cohen and Levinthal, 1989). Firms, as active searchers, scan the environment for new and useful knowledge, filter and judge alternatives encountered, and following the acquisition of that necessary knowledge (i.e. findings of a research, results of a project outside the firm), it is provided to R&D as an input to be processed (Pandza and Holt, 2007). Hence acquisition efforts develop high quality boundary spanning and knowledge processing systems, resulting in the recognition of unique knowledge for further exploitation. Utilization creates a deeper understanding on the outside technologies and businesses which enables firms to differentiate themselves from the external environment.

Finally, absorptive capacity endeavors to promote the speed, frequency and magnitude of product innovation by acting as a conduit of intra-organizational information/knowledge sharing (Kostopoulos et al., 2011). Besides the facilitating role of absorptive capacity in the identification and injection of new ideas and new opportunities, absorptive capacity acts as the medium through which newly acquired knowledge is communicated between different functions of the firm. Consequently, the imperfectly spread complementary knowledge embedded in different organizational units is translated into new products (Zahra and George, 2002).

Assimilation enables the coordination, systematization and socialization of external knowledge. For instance; assimilation leverages cross-functional interfaces, social linkages, and participative decision making enabling the firm to respond faster to environmental demands as well as developing new products more effectively

(Gebauer et al., 2012). Further, a firm's absorptive capacity promotes the new product development endeavors by acting as a medium through which newly acquired information is communicated between different units or departments of the firm (Kostopoulos et al., 2011; Müller-Seitz, 2012). Transformation, allows the communicated knowledge to be combined to the firm's existing knowledge base (Lane et al., 2006). Consequently, the complementary information embedded in different organizational units or departments can be translated into new products through transformation and assimilation of external information (Zahra and George, 2002). Therefore, it is proposed that:

H4: Absorptive capacity is positively related to firm product innovativeness.

4.3. Absorptive capacity, organizational symbols and product innovativeness

As the drivers of firm absorptive capacity, organizational symbols also influence firm product innovativeness. Using stories and metaphors and developing a common language, influence the creativity and decision making process of people during the product development efforts (Madhavan and Grover, 1998; Chang and Cho, 2008; Murovec and Prodan, 2009). For instance, past experiences, skills, knowledge and emotions unconsciously embodied and transmitted through organizational stories, metaphors and common language; (1) influence employees' perception of the external environment as sources of innovation, (2) facilitate the decision making process through a history-based action trajectory, (3) assist the recognition of knowledge value, based on the past experiences, and (4) establish a frame of reference platform to bridge the prior unconscious knowledge with the newly encountered external knowledge to extract a collective meaning, which in turn lead to enhances product innovativeness (Madhavan and Grover, 1998; Chang and Cho, 2008; Murovec and Prodan, 2009).

Moreover, organizational symbols establish the necessary infrastructure for the preservation and transfer of expertise in product-related technology, market, and customer related transactions, and process based activities into the future in order to increase the efficiency of product innovativeness, and meanwhile decrease

possibility of errors (Chang and Cho, 2008). This offers a platform through which the rest of the organization will gain the opportunity to learn, and repetitively implement successful practices on product and process innovation efforts (Goffin and Koners, 2011). The diversity and depth of the firm's internal knowledge base provide it with different frames of reference, standards, languages and codes, and greater operational flexibility. These advantages give the firm a more comprehensive understanding of the new information it receives, increasing its ability to scan and discover more and better ideas and valuable tacit knowledge in the environment (Chesbrough, 2003), and to access and select external opportunities more efficiently and faster (Cohen and Levinthal, 1990).

Organizational symbols further have the ability to generate a synergy and cohesiveness within the organization to share, communicate and integrate knowledge across departments, thus leading to internal knowledge generation regardless of the outside sources of information (Chang and Cho, 2008). For instance, the participatory symbols such as process-based and relationship-based stories which convey emotional experiences foster the development of coordinative organizational schemas for aligning in product innovation efforts (Camisón and Forés, 2011). They bring organizational members having diverging interests, capabilities and perspectives in to a coherent social interaction to orchestrate new product development processes.

A common particular point of origin which has a beginning, middle and an end offer a platform of coordinated thought and collective action. Explicitly process-based and relationship based stories; (1) build the boundaries of the acceptable behavior by translating ideas across different parts of the organization, (2) drive knowledge sharing allowing the generation of new inferences and applications of knowledge (e.g. internal and external), (3) clarify the ambiguous emergent situations to manipulate real-time problem-solving, and (4) direct the collective action towards a shared goal based on a common, coherent past (Bartel and Garud, 2009).

Also, organizational symbols contribute to the product innovativeness by establishing a common perception, and collective understanding regarding the processes, interactions and events that feed the NPD process (Walsh and Ungson, 1991). Product innovativeness is highlighted to have three particular characteristics; (1) the creation of new ideas, (2) the commercialization of these ideas into valuable products, and (3) the maintenance of these new products over time. Undeniably, the

investigation of practical domain specific NPD context reveals that organizational symbols provide the translation of unconscious knowledge and experiences into perception, frames of reference and subsequent action. Organizational symbols in general and generative and heuristic metaphors in particular provide an imaginative means of assessing the past and future action consequences. They offer a fixed starting point for the current context to be compared with and draw on a causal chain of events from the past to unveil already existing knowledge based on the similarities and resemblances between entities (Vanharanta and Easton, 2010).

Organizational symbols, other than their role for soliciting inferences based on similarities which help to the comprehension and systematization of knowledge, carry the role of generating new meaning beyond the previously existing resemblances. For instance, the use of metaphors explicitly allow organizational members to infer new meanings; by conjoining two exclusively different domains. The domains are conjoined through the use of metaphor by adding information which is initially seen dissimilar (i.e. new information/knowledge) to the existing domain or concept which is familiar (i.e. existing information/knowledge). This model of interaction of domains held by metaphor usage provides a generic space for the further connection and comparison of elements from the target meaning and the source of the metaphor (Cornelissen, 2005). Hence emergent opportunities for commercialization, novel ways of external knowledge application, flexibility in idea generation and knowledge utilization leveraged through the usage of metaphors heightens the NPD efforts translating into increased product innovativeness.

It should be also noted that, as mentioned before in hypothesis 4, firm absorptive capacity influences the firm product innovativeness. In this respect, in this thesis I argue that firm absorptive capacity mediates the organizational symbols-product innovativeness link. Here, absorptive capacity plays the leveraging role to combine already possessed stories, languages and metaphors with the external knowledge. Therefore:

H5: Absorptive capacity mediates the relationship between organizational symbols and firm product innovativeness.

4.4. Moderating role of environmental uncertainty

I posit that the use of organizational stories influence absorptive capability by improving learning and communication (under low to a moderate level of uncertainty). Law (2009, p. 387), for example, mention that "stories and storytelling are often used to cope with the dynamics of change and learn the new ways". I also argue that the usage of organizational stories becomes problematic for absorptive capability when the uncertainty level moves from a moderate to a higher level. For example, using organizational stories reinforces the status quo in organizations under the highly uncertain conditions, limiting their absorptive capabilities As organizational stories give order to peoples' understandings (Brown, 2006), and become a model, prototype, or exemplar for other stories (Myrsiades, 1987), they establish what ideas and behaviors are unacceptable and what is legitimate in organizations (Coopman and Meidlinger, 2000).

Also, the use of organizational stories decreases firm's absorptive capability by creating hegemonic structures where people need to seek feedback and recognize alternate interpretations of the stories (Helmet, 1993). As people are compelled to believe and remember hegemonic stories, and seldom question the underlying beliefs and worldviews embedded in them, their actions are constrained by inequitable distributions of power (Hernandez-Serrano et al., 2002). Their ability to exchange and understand the external information/knowledge becomes limited. This may lead people to conceal conflicting or contradictory information and omit other potentially valid interpretations and evaluations resulting in the oversimplification of the situation and thereby hindering the ability to exchange and understand the external knowledge (Feiereisen et al., 2008). Hence, in this thesis it is proposed that there is a nonlinear relationship between the use of organizational stories and absorptive capability in respect to environmental uncertainty. Therefore:

H6: The relationship between the organizational stories and absorptive capability across low, medium, and high levels of environmental uncertainty is an ∩-shaped.

I argue that metaphors help people to understand the external information by analogy, and capture experience and emotions better under the less uncertain

conditions (Feiereisen et al., 2008). However, the usage of metaphors poses some limitation on absorptive capability of organizations when the environmental uncertainty level increases. Specifically, the literature indicates that, for metaphors to work, the sender and receiver must understand the metaphor in the same way (Hamington, 2009). However, when there exist a higher level of uncertainty on the external information, the sender and receiver may not attach the same meaning to the terms which potentially enforce equivocality and the receiver brings his/her insight and experience about information/knowledge to understand the metaphors (Sicotte and Langley, 2000) . Also, as the use of metaphors tends to represent conceptual reductions (Hamington, 2009); it reduces the absorptive capability of firms under the highly uncertain conditions. Specifically, while metaphors are vital tools for understanding external knowledge, they can also oversimplify complex problems and relationships, cover certain domains, but often leave out others, and produce a one-sided perception by pushing back or de-emphasizing some other aspects. Therefore:

H7: The relationship between the usage of metaphors and absorptive capacity across low, medium, and high levels of environmental uncertainty follows an ∩-shaped curve.

With regard to common language, it is relevant to discuss that developing a common language becomes critical to absorptive capability of firms from a lower level to a moderate level of uncertainty. Developing a common language allows people to think and be able to express their knowledge to improve the understanding of external information and events. Also, in less uncertain conditions, developing a common language helps people to change their mental models and views; leads to the articulation of new “truths” of which they were previously unaware about external knowledge. On the other hand, from a moderate to a higher level of environmental uncertainty, a developed common language specific to the firms reduces the absorptive capability of organizations. This is such that even when a common language is spoken in the organization, the interpretation of the underlying meaning of information/knowledge can be different with increasing level of customer needs and technology related information/knowledge changes (Abecassis-Moedas and Mahmoud-Jouini, 2008). Also, developing a common language fosters a schema, which should be revised under changing environmental conditions. For instance, changes in market and technology related information prevents people from

using established or particular schemata, despite their personal preference to do so (Perry et al., 1994).

Also, when the environmental uncertainty increases, the homogeneity of the language used may be lost and the transformation of the knowledge into a coherent whole may be challenged (Kleinsmann et al., 2010). For instance, changes in market and technology related information prevent people from using an established or particular schema, despite their personal preference to do so. As a result, quickly changing environmental cues can easily be misread or simply disregarded hence resulting in the prevention of knowledge acquisition (Feiereisen et al., 2008), diminishing the absorptive capacity of organizations. Therefore, it is hypothesized that:

H8: The relationship between the common language and absorptive capacity across low, medium, and high levels of environmental uncertainty follows an ∩-shaped curve.

5. METHODOLOGY

5.1. Measures

To test the above hypotheses, multi-item scales adopted or developed from prior studies are used to measure the variables. Most of our research variables were measured using 5-point Likert scales ranging from “strongly disagree” (1) to “strongly agree” (5). The questionnaire is given in the Appendix-A at the end of the thesis. The metaphor usage variables carried an itemized rating scale from “extremely low” (1) to “extremely high” (5). Absorptive capacity questions were assessed with an itemized rating scale from “much worse” (1) to “much better” (5). Firm size and age questions were assessed by a ratio scale. The appendix contains the measures used. A brief summary of the measures is as follows.

In this thesis new perceptual question items are developed for organizational stories based on the writings of Boje (1991), Boyce (1995), Berry (2001), Hopkinson (2003), and Brown et al., (2009). For, organizational stories related to processes, we asked whether the organization had stories about its history, its product development efforts and process implementation efforts, its product markets, its business processes, its technological and market knowledge, its technology strategy implementations, and its creative actions. Regarding the organizational stories related to relationships, we asked if the organization had stories about interactions with its customers, relationships with its competitors, trading relationships with other firms, relationships among its employees, and its managers’ past business experience at other firms.

With regard to metaphors, we asked the participants about the extent to which metaphors are used in their organizations by developing new perceptional question items based on the literature (e.g., Gherardi, 2000; Jacobs and Heracleous, 2006). The literature notes that it is difficult to translate a metaphor into more precise and objective language, thus making rigorous testing and measurement elusive (Ng, 2009). Boland and Greenberg (1988), for instance, mention that different metaphors lead to different interpretations of the situation and therefore to the application of different problem-solving frameworks. In this respect, we asked the participants to what extent metaphors are used in their organizational life by developing new

perceptional question items based on the management literature (Ortony, 1993; Gherardi, 2000; Jacobs and Heracleous, 2006; Barner, 2008).

The management literature also mentions about two types of interrelated metaphors, namely generative and heuristic. Accordingly, for the use of generative metaphors, which relate to the act of reframing or discovering and creating new possibilities for actions that people had not previously considered (Gherardi, 2000), we asked about the extent to which metaphors used in innovation efforts act as tools for reframing and aid in discovery (creativity) throughout the organization. Regarding the use of heuristic metaphors, which enables access to more complex understanding and provides ways of making sense, and facilitates communication, reciprocal understanding and conversion of tacit knowledge into explicit knowledge (Gherardi, 2000), we asked about the extent to which people used metaphors to develop more complex understanding, provide meaning, and facilitate communication and reciprocal understanding.

Regarding the development of a common language, we developed new question items based on previous studies (e.g., Marshak, 1998; Robichaud et al., 2004; Jacobs and Heracleous, 2006). The literature indicates that, from a process perspective, common language emerges over time in organizations (Kleinsmann et al., 2010). A common language evolves when terms, notions and concepts are related to one another in a continuous synthesis (Styhre, 2002). However, it is difficult to operationalize these emerging processes with perceptual measures. In this sense, we adapted the discursive perspective in the literature, which allows for a measurable outcome for common language variables (Tsoukas, 2005).

A discursive practice is the norms-bound use of a sign system directed at or in the achievement of something (Harré and Gillett, 1994). Tsoukas (2005), for instance, mentioned that the emphasis discursivists place on language is often concerned with the performance of actions — actions whose performance can take place only via language. Even when saying and doing are relatively distinct, they represent a functionally indissoluble unit. Bruner (1990, pp. 18-19) also noted that “the meaning of talk is powerfully determined by the train of action in which it occurs.” Accordingly, we asked participants whether people developed a common language throughout the organization *to* enhance communication and knowledge sharing among its members, enhance the social relations, help organizational members to

digest the environment, such as technological and market, cues, and categorize experiences and assign meaning to those experiences.

For absorptive capacity variables, we used the question items developed by Camisón and Forés (2010). The firm product innovativeness question items were derived from Wang and Ahmed (2004). As control variables, we used firm size, indicated by the logarithm for number of employees; firm age, assessed by the logarithm for number of years since the firm's foundation; and environmental uncertainty, adapted from Jaworski and Kohli (1993), variables. Indeed, previous research suggests that firm size, firm age (Tsai et al., 2011), and environmental uncertainty (Akgün et al., 2014) can have significant influence on firm product innovativeness.

After developing the new question items in English, following Usunier's (2011) procedure, we formed a committee of bilingual translators, involving five translators (three in Turkish and two in English) who are expert in the research domain to avoid the etic and emic problems in translations. First, native English speakers from US-based universities who have more than 10 years of industrial experience evaluated the content and meaningfulness of the items to establish face validity. They did not note any difficulty in understanding the items or scales. The question items were then translated into Turkish by two bilingual researchers.

During the translation process, we discussed and "calibrated" our views and interpretations of the measurement items to generate a common conceptual basis. Here, we focused on the semantic/cultural rather than lexical/mechanical approaches to translation and assessed the degree of conceptual convergence across languages rather than forcing the source (English) meaning into the target (Turkish) context. After the Turkish translation of the question items, a third bilingual person retranslated them into English. The three translators then jointly reconciled all differences. A draft questionnaire was developed and then evaluated and revised in discussions with academics from Turkey who have expert knowledge of organizational behavior and innovation. The suitability of the Turkish version of the questionnaires was then pre-tested by 10 part-time graduate students who are full-time employees working in industry. In addition, 11 senior managers, randomly selected from a diverse cross-section of firms located in Istanbul, evaluated the content and meaningfulness of the items. Respondents did not demonstrate any difficulty in understanding the items or scales demonstrating face validity. After

confirming the questionnaire items, the Turkish co-authors distributed and collected the questionnaires, employing the “personally administrated questionnaire” method.

5.2. Sampling

We used stratified random sampling through the plan list obtained from the directory of the Istanbul Chamber of Industry. We chose the Istanbul district because this district is the center of the Turkish economy for manufacturing and service sectors. We generated a list of 500 eligible firms characterized by frequent or continuous product/service innovation, exploitation of new technologies in production/service, and moderate to high levels of technical and scientific expertise necessary for operations. These firms also (a) develop new products and export them to other countries, such as the UK, Germany, Central Asia, and Russia, (b) are organized and managed based on the Western management style (e.g., they operate in accordance with European quality standards), (c) are affiliated with Western firms, (d) have at least 30 employees, and (d) have been in business for more than five years.

First, we contacted the firms’ general managers by telephone and explained the aim of the study. Of the 500 firms contacted, 245 agreed to participate in the study. We selected managers or senior employees whose work involves technology and innovation and who had been employed in their firms for two years or longer to complete our survey as “key informants” (Kumar et al., 1993). Indeed Kumar et al., (1993), note that, “Response error is likely to be higher for informants whose roles are not closely related to the concepts under study.” We chose these managers because they were likely to have a “bigger picture view” of projects than other employees in the organization and likely to assess organizational knowledge, past experiences, and innovation more accurately.

After qualifying the respondents, we informed each that his/her responses would remain anonymous and would not be linked to them individually, nor to their companies, or products. This was done to assure anonymity, thus increasing the motivation of informants to cooperate without the fear of potential reprisals. In addition, we assured respondents that there were no right and wrong answers and that they should answer questions as honestly and forthrightly as possible (Podsakoff et

al., 2003). Next, we asked that our selected respondents have at least a college or graduate degree to understand our survey question items.

Furthermore, because at first glance metaphor usage and organizational stories seem to be similar, we explained the term metaphor and provided examples to distinguish metaphors from stories in our survey. In this vein, we prepared and presented a half-page description to each respondent to clarify what metaphors are, describe their features, and provide examples. Also, since we collected the data personally, we explained the terms before the respondents started to answer the question items.

Of the 245 firms that agreed to participate, 223 completed our questionnaires via a face to face interview. In order to control internal validity, we asked the same question items on different pages of the survey. For instance, "we are faster in responding to customer needs than our competitors" and "in our organization, we have a great deal of knowledge about products' features" appeared two times each in our survey. If the responses to these question items were not close to each other (our decision rule was ± 1), we deleted that survey from our analysis. Because of data screening, 20 out of 223 surveys were discarded. Thus, our analyzable sample consisted of 203 firms. We compared the mean of variables, firm size, and ages of the eliminated surveys with the rest of the surveys used for the analysis and found no statistical differences among them.

The sample consisted of employees having different positions within the firms. As shown in Table 5.1 the respondents were senior employees/staff members (26%), senior engineers (24%), functional/department managers (21%), product/project managers (14%), technical leaders (10%), owners of the firm (4%), and general managers (1%).

Table 5.1: The Position of the Respondents within the Firms

Position	Percentage %
Senior employees/staff members	26%
Senior engineers	24%
Functional/department managers	21%
Product/project managers	14%
Technical leaders	10%
Owners of the firm	4%
General managers	1%

The included industries in the research and their percentages are shown in Table 5.2. The industries involved are; finance (17%), machinery and manufacturing (14%), service (11%), chemical (9%), automotive (8%), healthcare (8%), materials (8%), information technologies (6%), food (5%), telecommunication (5%), and other (9%) such as electronics, construction, petroleum, and pharmaceutical.

Table 5.2: The Industries Involved in the Research and Their Percentages

Sector	Percentage %
Finance	17%
Machinery and Manufacturing	14%
Service	11%
Chemical	9%
Automotive	8%
Healthcare	8%
Materials	8%
Information Technologies	6%
Food	5%
Telecommunication	5%
Other (electronics, construction, petroleum, pharmaceutical)	9%

6. ANALYSIS AND RESULTS

6.1. Measure Validity and Reliability

After the data collection, we assessed the reliability and validity of measures by employing a data purification process (Anderson and Gerbing, 1984; Fornell and Larcker, 1981). Since the organizational symbol variables are new –previously not measured at the organizational level-, we conducted an Exploratory Factor Analysis (EFA), using a principle component with a Direct Oblimin rotation of all the items grouped under each of the five criteria namely; process-based stories, relationship-based stories, generative metaphors, heuristic metaphors and common language. Oblique rotations of the oblimin type, which are used to obtain theoretically significant factors, are better suited to the aims of the present study than orthogonal rotations, which are preferable when the aim is to reduce the number of variables (Berne and García-Uceda, 2008). Also, oblique rotations are more convenient when variables are correlated or covariant. In this respect, we first checked the Kaiser-Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity to determine whether the factor analysis was appropriate for our data set. The KMO statistic was .91, above the threshold value of 0.6, suggesting that the data was suitable for factor analytic procedures. Also, Bartlett's sphericity test resulted in a significant chi-square statistic (x^2/df = 3909.96/496, p-value = .0), indicating adequate correlation among the items.

Table 6.1 presents the *Pattern Matrix*, that converged in eight rotations, to explain the relative component groupings' eigenvalues, and percentage of variance explained. It is shown that the items load satisfactorily and appropriately onto their respective factors, at factor loading exceeding the suggested levels of .5 (Hair et al., 1998) and without cross-loading, thereby indicating convergent validity. The five-factor solution explains 67.58 % of variance. Items load positively on the components with the exception of some factors, such as metaphors and common language, where all items load negatively. Given that each item loads negatively on the component, rather than some items loading negatively and other positively, the negative loadings are maintained, i.e. the items are not recoded.

Table 6.1: Discriminant Validity of Construct Measures Factor Rotation

Constructs	Items	F1	F2	F3	F4	F5
Story – processes (F1)	S1	.56				
	S2	.80				
	S3	.85				
	S4	.64				
	S5	.61				
	S6	.62				
	S7	.67				
	S9	.51				
Heuristic metaphors (F2)	M1		-.72			
	M2		-.68			
	M3		-.60			
	M4		-.76			
	M5		-.86			
	M6		-.84			
	M7		-.85			
	M8		-.79			
Common language (F3)	L1			-.89		
	L2			-.88		
	L3			-.84		
	L4			-.78		
	L5			-.82		
	L6			-.77		
	L7			-.80		
Story-relationships (F4)	S10				.77	
	S11				.72	
	S12				.66	
	S13				.58	
	S14				.65	
Generative metaphors (F5)	M9					-.64
	M10					-.91
	M11					-.61
	M12					-.77
Eigenvalue	Total	11.51	4.19	3.60	1.20	1.13
% of variance explained	67.58	35.99	13.08	11.24	3.75	3.52

After performing the exploratory factor analysis, which is useful for scale construction, in order to assess the discriminant validity a series of two-factor models, as recommended by Bagozzi et al., (1991), were estimated in which individual factor correlations, one at a time, were restricted to unity by using AMOS 4.0. Subsequently the fit of the restricted models were compared to those of the original model. In total, we performed 10 models – 20 pairs of comparisons. The chi-square changes ($\Delta\chi^2$) in each model, constrained and unconstrained, were significant,

$\Delta\chi^2 > 3.84$, which suggests that the organizational symbol variables demonstrated discriminant validity, as shown Table 6.2.

Table 6.2: Discriminate analysis of the construct measures

Constructs	Unconstrained (χ^2/d.f)	Constrained (χ^2/d.f)	$\Delta\chi^2$
Story – processes (F1) vs. Heuristic metaphors (F2)	177.96/103	245.98/104	68.02
Story – processes (F1) vs. Common language (F3)	228.84/89	284.23/90	55.39
Story – processes (F1) vs Story - relationships (F4)	143.49/64	174.31/65	30.82
Story – processes (F1) vs Generative metaphors (F5)	116.47/53	182.93/54	66.46
Heuristic metaphors (F2) vs. Common language (F3)	211.03/89	285.16/90	74.13
Heuristic metaphors (F2) vs Story - relationships (F4)	134.98/64	202.97/65	67.99
Heuristic metaphors (F2) vs Generative metaphors (F5)	131.12/53	168.94/54	37.82
Common language (F3) vs Story - relationships (F4)	130.75/53	205.02/54	74.27
Common language (F3) vs Generative metaphors (F5)	109.56/43	174.89/44	65.33
Story – relationships (F4) vs Generative metaphors (F5)	47.09/26	111.37/27	64.28

All $\Delta\chi^2$ are significant at P<.05 level

Next, we conducted a subsequent confirmatory analysis (CFA) by using AMOS 4.0 to assess the resulting scales of organizational symbols consisting of 5 constructs and 37 question items. The initial results of confirmatory factor analysis revealed that the initial model adequately fit the data. The fit indexes were $\chi^2_{(454)}$=822.19, CFI=.91, RMSEA=.06.

Further, we performed a CFA to assess the scales of absorptive capability variables (i.e., information/knowledge acquisition, assimilation, transformation, and utilization). After dropping some question items, which had low factor loadings or cross-loads with other variables, in a step-by-step procedure, the results indicated that model fit adequately ($\chi^2_{(113)}$=232,32, CFI=.95, RMSEA=.07).

Furthermore, all the factors; organizational symbols, absorptive capacity, environmental uncertainty and product innovativeness, were included in one CFA model. During the CFA analysis, subscales or parcels (a method aggregating or taking the mean of several items that purportedly measure the same construct as indicators of a latent variable) were used for the CFA instead of individual items, as

recommended by Schmit and Ryan (1993). These researchers noted that goodness-of-fit measures are affected when the number of items used to identify a small number of factors is relatively large. Consistent with this approach, we created two sub-scores or parcels for each scale, each consisting of a randomly divided subset of the items in the scale. The CFA produced a good fit with a comparative fit index (CFI) of .97 (also, $\chi^2_{(154)} = 199.64$, RMSEA = .05).

Table 6.3 reports the reliabilities of the multiple-item, reflective measures, along with construct correlations and descriptive statistics for the scales. Table 6.3 also demonstrates that all reliability estimates, including coefficient alphas are well beyond the threshold level of .70 as recommended by Nunnally (1978). The results indicate that measures are uni-dimensional and have adequate reliability and discriminant validity.

Table 6.3: Correlations and Descriptive Statistics

Mean	S.Dev		**Variables**	1	2	3	4	5	6	7	8	9	10	11	12	13
3.57	.97	1	Product innovativeness	(.94)												
3.17	.87	2	Acquisition	.68***	(.86)											
3.31	.77	3	Assimilation	.67***	.70***	(.87)										
3.35	.79	4	Transformation	.63***	.69***	.73***	(.88)									
3.21	.84	5	Utilization	.65***	.69***	.72***	.74***	(.90)								
3.50	.82	6	Story - relationships	.15**	.12*	.10	.13*	.11*	(.81)							
3.35	.75	7	Story – processes	.43***	.45***	.43***	.38***	.46***	.67***	(.89)						
2.95	.86	8	Generative metaphors	.39***	.41***	.40***	.41***	.38***	.32***	.41***	(.86)					
2.87	.83	9	Heuristic metaphors	.41***	.43***	.44***	.43***	.49***	.30***	.43***	.73***	(.93)				
3.20	.87	10	Common language	.43***	.49***	.53***	.52***	.53***	.22***	.47***	.38***	.33***	(.93)			
2.90	.93	11	Env. uncertainty	-.05	.03	.07	.05	-.02	.11	.06	.14*	.07	-.02	(.80)		
1.26	.37	12	Firm age (log)	.12*	.15*	.09	.01	.06	.12*	.11	-.09	.01	.13*	-.16**	NA	
2.47	.83	13	Firm size (log)	-.03	.08	.06	-.04	.04	-.11	-.05	-.05	.02	.03	-.18**	.44***	NA

* $p < .1$, ** $p < .05$, *** $p < .01$
Diagonals show the Cronbach's alphas

6.2. Common Method Variance Assessment

At this stage of the analysis, we checked for potential common method bias with the Harman one-factor test (Podsakoff and Organ, 1986). The results of an unrotated principal component analysis with varimax rotation indicate that common method variance does not pose a serious problem in our investigation because; (1) several factors with eigenvalues greater than 1 were identified, explaining 71.09% of the total variance, and (2) no factor accounted for almost all the variance (i.e., highest single variance extracted was 31.24%).

Also, we compared the measurement model without the common method variance (CMV) factor and with the factor (Podsakoff et al., 2003). A comparison of the two models indicated that the change in fit indexes was not significant. After adding the common method factor, only small differences in the fit measures between the model without a common method factor ($\chi 2/df=1.60$; CFI=.89; RMSEA=.055) and the model with a common method factor ($\chi 2/df=1.55$; CFI=.90; RMSEA=.052) emerged. A comparison of the parameter estimates when common method variance was and was not controlled for revealed that the path coefficients linking the constructs were not significantly affected (differences between the standardized regression estimates greater than .20 may indicate common method variance) (Akgün et al., 2014).

Furthermore, we partialed out the smallest correlation of the remaining correlations to remove the effect of common method bias by following the Lindell and Whitney (2001) method. Given that all unadjusted correlation coefficients remain statistically significant at $p < .05$ after adjusting for common method bias, even under the strictest conditions applied in our sensitivity analysis. Therefore, we are confident that the findings of our analysis are not attributable to common method bias.

6.3. Hypothesis Testing

To test the hypotheses of our proposed model, we performed a structural equation modeling (SEM) analysis. During the analysis, we used the composite scores of the question items for the respective variables due to the relatively small

sample size. Indeed, small sample sizes create problems for maximum likelihood-based estimation procedures like AMOS, since they tend to produce unstable results (Fornell, 1983). Also, possible measurement errors along with the relatively small sample size may affect our findings as the number of parameters to be estimated for any given sample size increases (Bagozzi, 1981).

Also, consistent with our concept development section, we allowed the parameters representing the covariances across absorptive capacity variables to be free. We also allowed organizational symbol variables to be covariant among each other. We found that the covariance among organizational symbols and absorptive capacity variables was significant, indicating that these variables occur simultaneously and affect each other.

Table 6.4 demonstrates the results of the path model hence reveal the relationships among organizational symbols, absorptive capacity, and firm product innovativeness. *Regarding the relationship between organizational stories and absorptive capacity*, we found that process-based organizational stories are positively associated with four dimensions of absorptive capacity, supporting H1a. Explicitly; (1) the relationship between organizational stories about processes and acquisition dimension of absorptive capacity is positive and significant ($\beta = .41$, $p < .01$), (2) the relationship between organizational stories about processes and assimilation dimension of absorptive capacity is positive and significant ($\beta = .40$, $p < .01$), (3) the relationship between organizational stories about processes and transformation dimension of absorptive capacity is positive and significant ($\beta = .21$, $p < .01$), (4) the relationship between organizational stories about processes and utilization dimension of absorptive capacity is positive and significant ($\beta = .43$, $p < .01$).

On the other hand, relationships-based organizational stories were negatively associated with all four dimensions of absorptive capacity, not supporting H1b. Explicitly; (1) the relationship between organizational stories about relationships and acquisition dimension of absorptive capacity is negative and significant ($\beta = -.31$, $p < .01$), (2) the relationship between organizational stories about relationships and assimilation dimension of absorptive capacity is negative and significant ($\beta = -.32$, $p < .01$), (3) the relationship between organizational stories about relationships and transformation dimension of absorptive capacity is negative and significant ($\beta = -.19$, $p < .05$), (4) the relationship between organizational stories about relationships and

utilization dimension of absorptive capacity is negative and significant ($\beta = -.35$, $p < .01$).

*Regarding the relationship between organizational metaphors and absorptive capacity, w*e found that heuristic metaphor usage is positively associated with four dimensions of absorptive capacity, supporting H2b. Explicitly; (1) the heuristic metaphor usage has a positive and significant relationship with acquisition ($\beta = .21$, $p < .01$), (2) the heuristic metaphor usage has a positive and significant relationship with assimilation ($\beta = .26$, $p < .01$), (3) the heuristic metaphor usage has a positive and significant relationship with transformation ($\beta = .18$, $p < .05$), (4) the heuristic metaphor usage has a positive and significant relationship with utilization ($\beta = .37$, $p < .01$). On the other hand, there was no statistical association between generative metaphor usage and firm absorptive capacity, not supporting H2a.

For the relationship between common language development and absorptive capacity, we found a positive statistical association between developing a common language and absorptive capacity, supporting H3. Particularly; (1) the common language development has a positive and significant relationship with acquisition ($\beta = .27$, $p < .01$), (2) the common language development has a positive and significant relationship with assimilation ($\beta = .33$, $p < .01$), (3) the common language development has a positive and significant relationship with transformation ($\beta = .36$, $p < .01$), (4) the common language development has a positive and significant relationship with utilization ($\beta = .32$, $p < .01$).

Regarding H4; the relationship between absorptive capacity and product innovativeness, our results reveal that information/knowledge acquisition, assimilation, and utilization are positively related with the firm product innovativeness, but there is no statistical association found between information/knowledge transformation and firm product innovativeness, partially supporting H4 or providing some confirmation for the absorptive capacity construct-product innovativeness hypothesis. Explicitly revealing the results; (1) acquisition has a positive and significant relationship with product innovativeness ($\beta = .33$, $p < .01$), (2) assimilation has a positive and significant relationship with product innovativeness ($\beta = .24$, $p < .05$), (3) transformation does not have a significant relationship with product innovativeness ($p > .10$), (4) utilization has a positive and significant relationship with product innovativeness ($\beta = .17$, $p < .05$).

Table 6.4: Results of Path Model

Hypotheses	Path	Path Value	Result
H1b	Story – relationships → Acquisition	-.31***	Not Supported
	Story – relationships → Assimilation	-.32 ***	
	Story – relationships → Transformation	-.19**	
	Story – relationships → Utilization	-.35 ***	
H1a	Story – processes → Acquisition	.41***	Supported
	Story – processes → Assimilation	.40***	
	Story – processes → Transformation	.21***	
	Story – processes → Utilization	.43***	
H2a	Gen. Metaphors → Acquisition	.08	Not Supported
	Gen. Metaphors → Assimilation	.02	
	Gen. Metaphors → Transformation	.13	
	Gen. Metaphors → Utilization	-.07	
H2b	Heur. Metaphors → Acquisition	.21***	Supported
	Heur. Metaphors → Assimilation	.26***	
	Heur. Metaphors → Transformation	.18**	
	Heur. Metaphors → Utilization	.37***	
H3	Common language → Acquisition	.27 ***	Supported
	Common language → Assimilation	.33 ***	
	Common language → Transformation	.36 ***	
	Common language → Utilization	.32 ***	
H4	Acquisition → Product innovativeness	.33 ***	Partially Supported
	Assimilation → Product innovativeness	.24 **	
	Transformation → Product innovativeness	.08	
	Utilization → Product innovativeness	.17**	
Control variables	Firm age → Product innovativeness	.09**	
	Firm size→ Product innovativeness	- 12**	

χ^2 (24) = 79.67, χ^2/df, = 3.32, IFI = .95, CFI = .95, RMSEA = .10

Path coefficients are standardized.
$^{*}p$ <.1, $^{**}p$ < .05, $^{***}p$ < .01

Additionally, as shown in Table 6.5 the results of the analysis indicate that organizational symbols explain; 38% of variance (R^2 = .38), (i.e., quantify how much regression line is useful to predict/model) absorptive capacity) in knowledge acquisition, 41% of variance in knowledge assimilation (R^2 = .41), 37% of variance in knowledge transformation (R^2 = .37), and 45% of variance in knowledge utilization (R^2 = .45). Furthermore, absorptive capacity explains 53% of the variance in product innovativeness (R^2 = .53).

Table 6.5: Variance Explained in Endogeneous Constructs

	Endogeneous Construct	Final Model
R^2	Acquisition	.38
	Assimilation	.41
	Transformation	.37
	Utilization	.45
	Product Innovativeness	.53

To test the mediating effect of absorptive capacity between organizational symbols and firm product innovativeness, we employed Baron and Kenny's (1986) procedure where: a variable (*M*) mediates the relationship between an independent variable (*X*) and a dependent variable (*Y*) if: a) *X* is significantly related to *Y* ; b) *X* is significantly related to *M*; c) after *X* is controlled for, *M* remains significantly related to *Y* ; and d) after *M* is controlled for, the *X* – *Y* relationship is zero. Steps b) and c) are the essential steps in establishing mediation and step d) is only necessary to prove a fully mediated effect. Also, the presence of the mediator (*M*) must reduce the impact of the independent variable on the outcome compared to when *M* is not present. Further, entering the mediator into the AMOS based SEM model should also result in a significant increase in R^2. In this respect, we ran three different SEM models, as shown of Table 6.4:

a) **Model 1,** including all the organizational symbol variables (X) and firm product innovativeness (Y), indicates that organizational stories about processes ($\beta = .42$, $p < .01$), heuristic metaphors ($\beta = .18$, $p < .05$), and common language ($\beta = .19$, $p < .01$) are positively related to product innovativeness, while organizational stories about relationships are negatively associated with product innovativeness and generative metaphors have no significant relationship.

Table 6.6: Results of Mediating Hypothesis

Relationship	Model 1	Model 2	Model 3
Story – relationships → Product innovativeness	-.29***		-.06
Story – processes → Product innovativeness	.42***		.13
Gen. Metaphors → Product innovativeness	.10		.07
Heur. Metaphors → Product innovativeness	.18**		-.01
Common language → Product innovativeness	.19***		-.03
Story – relationships → Acquisition		-.32***	-32***
Story – relationships → Assimilation		-.33***	-.33***
Story – relationships → Transformation		-.19**	-.19**
Story – relationships → Utilization		-.35***	-.35***
Story – processes → Acquisition		.41***	.41***
Story – processes → Assimilation		.40***	.40***
Story – processes → Transformation		.21***	.21***
Story – processes → Utilization		.43***	.43***
Gen. Metaphors → Acquisition		.08	.08
Gen. Metaphors → Assimilation		.02	.02
Gen. Metaphors → Transformation		.13	.13
Gen. Metaphors → Utilization		-.07	-.07
Heur. Metaphors → Acquisition		.21***	.21***
Heur. Metaphors → Assimilation		.26***	.26***
Heur. Metaphors → Transformation		.18**	.18**
Heur. Metaphors → Utilization		.37***	.37***
Common language → Acquisition		.27***	.27***
Common language → Assimilation		.33***	.33***
Common language → Transformation		.36***	.36***
Common language → Utilization		.32***	.32***
Acquisition→ Product innovativeness			.33***
Assimilation→ Product innovativeness			.24**
Transformation → Product innovativeness			.08
Utilization → Product innovativeness			.17**
Firm size→ Product innovativeness	-.09*		.09*
Firm age→ Product innovativeness	.13**		.13**
	$\chi^2_{(18)}$ = 65.27 χ^2/df, =5.94 IFI = .91 CFI = .91 RMSEA = .15	Full model	$\chi^2_{(29)}$ = 75.21 χ^2/df, =3.95 IFI = .96 CFI = .96 RMSEA = .11

Path coefficients are standardized.
$^{*}p$ <.1, $^{**}p$ < .05, $^{***}p$ < .01

b) **Model 2,** covering the organizational symbol variables (X) and the absorptive capacity variables (M), shows that all organizational symbol variables except generative metaphors are associated with all of the absorptive capacity variables. Explicitly; relationship-based organizational stories have negative and significant

relationship with knowledge acquisition (β = -.32, $p < .01$), knowledge assimilation (β = -.33, $p < .01$), knowledge transformation (β = -.19, $p < .05$), and knowledge utilization (β = -.35, $p < .01$). Relationship based stories have positive and significant relationship with absorptive capacity variables; knowledge acquisition (β = .41, $p < .01$), knowledge assimilation (β = .40, $p < .01$), knowledge transformation (β = .21, $p < .01$), knowledge utilization (β = .43, $p < .01$). Heuristic metaphors are positively and significantly related to; knowledge acquisition (β = .21, $p < .05$), knowledge assimilation (β = .26, $p < .01$), knowledge transformation (β = .18, $p < .05$), knowledge utilization (β = .37, $p < .01$). Also common language have positive and significant relationship with; knowledge acquisition (β = .27, $p < .01$), knowledge assimilation (β = .33, $p < .01$), knowledge transformation (β = .36, $p < .01$), knowledge utilization (β = .32, $p < .01$). Additionally the variance explained in absorptive capacity variables are; $R^2_{acquisition} = .38$, $R^2_{assimilation} = .41$, $R^2_{transformation} = .37$, and $R^2_{utilization} = .45$.

c) As shown in **Model 3,** after organizational symbol variables (X) are controlled, the results reveal that knowledge acquisition (M) (β = .33, $p < .01$), assimilation (M) (β = .24 $p < .05$), and utilization (M) (β = .17, $p < .05$) are positively associated with product innovativeness (Y) whereas transformation (M) is found to have no significant relationship with product innovation.

Based on the above results, absorptive capacity mediates the relationship between organizational symbols and product innovativeness, supporting H5.

To test the moderator role of environmental uncertainty between organizational symbols and absorptive capacity, concerning for H6-H8, a moderated SEM analysis was used. Because of the possibility of multicollinearity, the environmental uncertainty, organizational story, metaphor and common language variables were mean-centered before performing the analysis. Table 6.7 shows that the relationship between the process-related organizational stories and absorptive capacity variables across low, medium, and high levels of environmental uncertainty has an ∩-shaped. However, it has been found that organizational stories about relationships and absorptive capacity variables have a U-shaped relationship, partially supporting H6. Finally, there isn't any moderating role of environmental uncertainty between developing a common language and using metaphors and absorptive capacity, not supporting H7 and H8.

Table 6.7: Results of Moderator Role of Environmental Uncertainty

Relationship	Path value	Results
Story – relationships → Acquisition	.37***	
Story – relationships → Assimilation	.30***	
Story – relationships → Transformation	.03	
Story – relationships → Utilization	.24**	
Story – processes → Acquisition	-.30***	
Story – processes → Assimilation	-.22**	
Story – processes → Transformation	-.06	
Story – processes → Utilization	-.26**	
Gen. Metaphors → Acquisition	.03	
Gen. Metaphors → Assimilation	-.02	
Gen. Metaphors → Transformation	.09	
Gen. Metaphors → Utilization	-.11	
Heur. Metaphors → Acquisition	.22**	
Heur. Metaphors → Assimilation	.25***	
Heur. Metaphors → Transformation	.21**	
Heur. Metaphors → Utilization	.37***	
Common language → Acquisition	.19**	
Common language → Assimilation	.25***	
Common language → Transformation	.28***	
Common language → Utilization	.26***	
Env. uncertainty → Acquisition	.14**	
Env. uncertainty → Assimilation	.18**	
Env. uncertainty → Transformation	.06	
Env. uncertainty → Utilization	.07	
(Env. uncertainty) ^{2} → Acquisition	-.08	
(Env. uncertainty) ^{2} → Assimilation	-.15**	
(Env. uncertainty) ^{2} → Transformation	-.07	
(Env. uncertainty) ^{2} → Utilization	-.13**	
Story-relationships * (Env. Unc.) ^{2} → Acquisition	-.02	
Story-relationships * (Env. Unc.) ^{2} → Assimilation	-.21**	
Story-relationships * (Env. Unc.) ^{2} → Transformation	-21**	
Story-relationships * (Env. Unc.) ^{2} → Utilization	-.19**	Partially
Story-processes * (Env. Unc.) ^{2} → Acquisition	.05	Supported
Story-processes * (Env. Unc.) ^{2} → Assimilation	.16**	
Story-processes * (Env. Unc.) ^{2} → Transformation	.27***	
Story-processes * (Env. Unc.) ^{2} → Utilization	.32***	
Gen. metaphor * (Env. Unc.) ^{2} → Acquisition	.08	
Gen. metaphor * (Env. Unc.) ^{2} → Assimilation	.02	
Gen. metaphor * (Env. Unc.) ^{2} → Transformation	.07	
Gen. metaphor * (Env. Unc.) ^{2} → Utilization	-.02	Not
Heuristic metaphor * (Env. Unc.) ^{2} → Acquisition	-.02	Supported
Heuristic metaphor * (Env. Unc.) ^{2} → Assimilation	.10	
Heuristic metaphor * (Env. Unc.) ^{2} → Transformation	-.05	
Heuristic metaphor * (Env. Unc.) ^{2} → Utilization	.10	
Common language * (Env. Unc.) ^{2} → Acquisition	.07	
Common language * (Env. Unc.) ^{2} → Assimilation	.07	Not
Common language * (Env. Unc.) ^{2} → Transformation	.06	Supported
Common language * (Env. Unc.) ^{2} → Utilization	.02	

$^{*}p$ <.1, $^{**}p$ < .05, $^{***}p$ < .01; Full model

7. DISCUSSION AND IMPLICATIONS

This thesis, *first* empirically showed that the use of process-related organizational stories (e.g., telling stories about product development and process implementation efforts, technological knowledge, market and technology strategy implementations in the organizations) is positively related to the absorptive capacity of organizations. It appears that process related organizational stories provide people with normative guides and examples of general themes or ideas for their behavior and actions during the external information/knowledge acquiring, assimilating transferring and utilizing. Additionally, by empirically enhancing the Boyce's (1995) work on organizational stories, it seems that process related organizational stories create a sense of unity and common purpose among organizational members, and express shared experience for an effective absorptive capacity. This finding specifically leverages the theoretical arguments of Van den Hende and Schoormans (2012) on the implicit role of stories in the inductive process of external knowledge acquisition and implementation for NPD success. Managers we interviewed also confirmed that:

"We see that telling past stories about the firm's technical and market knowledge in the engineering training sessions or official speeches guide our employees' actions and provide examples of general themes or ideas for their behaviors on how they get and use external knowledge to improve our innovation projects."

"Organizational stories, such as how we successfully implemented new information technologies or quality management tools, (e.g. just in time) and legends (e.g. success of one of our engineers who persisted in working on an invention to cut down the cost 30 % on machine operations) clarify and concretize our corporate values and beliefs, and are often told to almost every newcomer to the company. Those stories or lessons learned from past historical successes and failures are important for their empowering effects of articulation, clarification and usage of external knowledge too."

This thesis also showed a negative statistical relationship between the use of past relationship-based organizational stories (such as, telling stories about the interactions with customers, relationship with competitors and other firms, employee relationships and manager's past experiences in other firms) and firm absorptive capacity. Such that, past stories about the interactions with customers, relationships with competitors and other firms, employee relationships and managers' past experiences in other firms reduce the firms' ability to acquire, assimilate, understand, disseminate and use external information/knowledge. The reason for this finding might be related to the lack of story ownership by people who are exposed to the story, as mentioned by Van den Hende and Schoormans (2012). People who are unfamiliar with the original relationship-based organizational stories may not be able to associate themselves with the main character and make sense of the stories without considering the meaning and emotional attachments of those stories. We believe that past relationship-based organizational stories create the authentic heritage, such as historical culture and values that persist of an organization. While those repeating stories ensure collective cultural understanding, they hinder adapting new perspectives, blind people with past successes, and stick people to events and people in that they are anecdotal, limiting absorptive capacity of organizations. Also, people make judgments by inferring what is meant and thereby corrupting the original meaning until/unless their information is updated. As a result, people question the story's believability and plausibility, as well as the sequence of events in the story. Managers we interviewed also revealed that:

"When new managers tell stories about their previous jobs or firms that they worked for, or inform employees about how and why they have achieved what they have, people start to write a scenario in advance, and perceive these stories as an entertainment value when they encounter in the hallway or during the lunch. People also think that those stories are the informal processes of persuasion, and then they resist accepting them."

"We see that when people process external technology related information in accordance with threatening or negative stories about firm's customers, competitors or clients (embarrassing experience, gossiping, a sense of urgency), they overvalue

that information and ignore the exploration of other external information usage in the organization."

This thesis next statistically demonstrated that the use of heuristic metaphors, which are the manifestations of something learnt or close to symbols and to the act of symbolizing, is positively associated with a firm's absorptive capacity, align with the Vanharanta and Easton's (2010) and Goffin and Koners' (2011) theoretical arguments. Here, it seems that people comprehend the complex message of external information/knowledge to draw inferences by use of heuristic metaphors articulated primarily via images and symbols. In addition, this finding improves the Klein et al., (1998) argument on the embedded nature of metaphors in the recognition and analysis of externally acquired knowledge particularly important in the NPD context through pattern formation, effective representation, and management. Managers we interviewed also mentioned that:

"We used imaginative metaphors such as iceberg visualization, sketches, and diagrams, to gain understanding of hidden ideas on the knowledge we acquired and used in our operations. This enables us to feel rather than think in an emotional context within the external information acquisition, dissemination and usage processes."

"In the external knowledge usage efforts we use metaphors such as nurturing and bringing up a child. This metaphor leverages the persistence of people on the knowledge requirements from outside, improves their commitment to new knowledge creation, and enhances their attachment to new knowledge. In our organization we also use the business vision or vision statement as metaphors to enable people to make sense of the external knowledge in our strategic perspective, and inspire them to ally their new knowledge creation activities with our firm's objectives."

This thesis further showed that the relationship between the use of generative metaphors, which are means to create new understanding and closer to creativity, and the absorptive capacity, is not statistically significant. We believe that the lack of statistical significance could be due to significant co-variances among organizational symbol variables. The use of generative metaphors, which are future-oriented, influences the firm absorptive capacity through the use of heuristic metaphors,

organizational stories, and an established common language. This is in line with theoretical writings of Clegg and Hardy (1996) and Gherardi (2000). Such that, generative metaphors, such as using the terms of organizational culture, learning, and memory to fuel the strategy development and manage the changes and innovations, or using the proverbs to transmit the tacit knowledge, help people to leverage the richness of the stories, create new connections among stories, and promote engagements with stories and common language (Broussine and Vince, 1996).

This thesis, furthermore, empirically demonstrated that creating and developing a common language is positively related to the absorptive capacity of organizations, as implicitly mentioned by Zahay et al., (2004). Specifically, this finding extends Kleinsmann et al., (2010) study by providing empirical evidence of how a shared understanding of external information is established throughout the organization via the use of common language. developing a common language to enhance social relations, imagination and knowledge sharing among people, and to help people to digest the technological and market cues influence the absorptive capacity of an organization. It appears that a common language creates a framework (a common conceptual apparatus) and provides a context for observing, acquiring, interpreting and utilizing the external information/knowledge.

Managers we interviewed also noted that:

"A common language in the form of standardized description of tasks, manuals and work descriptions enhance the communication among the people, and enable them to assimilate new knowledge without consulting their colleagues. People feel that they are collocated."

"Organizational routines and rules demonstrate our common language in the organization and are used in the managing of knowledge management activities. They provide the context for observing and interpreting technology related information/knowledge. They also facilitate the knowledge integration among the different departments. By integrating external knowledge from other knowledge domains in our organization, people explore new knowledge and at the same time exploit the standards and tools (knowledge) developed in the past."

"We develop a more homely, everyday example (such as, four-petal flower, brotherhood) that could be concisely presented in verbal, written, or pictorial form in our knowledge absorption process. That common language provides a basis for making decisions about knowledge usage and diminish the borders between "us" and "others" attitude in our organization. We also saw that a common language is more than a medium for communication; rather it is a resource that (re)produces the organizational memory."

Second, this thesis empirically leveraged the psychodynamic view of organizations in the absorptive capacity literature. The organizational behavior literature indicates that the psychodynamic view has much to offer management practice by way of insights into the deep-rooted nature of workplace behaviors (Stein, 2004; Cohler and Galatzer-Levy, 2007). Thompson (2005, p. 582), for instance, notes that "this view looks at the "deep" layers of the unconscious for evidence of the innate self of the organization." Such that, most of the thought and activity takes place outside of conscious awareness and is mediated by stories, language, and metaphors.

Third, this thesis showed the positive relationship between absorptive capacity and firm product innovativeness. When organizations successfully recognize the value of externally encountered and acquired knowledge, and transform and utilize that external information/knowledge, those firms develop better and faster new products than their competitors. In a sense, absorptive capacity helps firms to envisage the future and imagine how the new products can be created, before all the necessary knowledge, circumstances or conditions exist. Also, it appears that absorptive capacity enables firms to anticipate the potential developmental path(s) of the technological know-how by recognizing the context around technology and market related information/knowledge, and changes in its environment. This finding enhances previous studies in the NPD literature by specifically investigating the absorptive capacity-product innovativeness link. Previous studies, for instance, have investigated the relationship between absorptive capability and (a) absorption and utilization of knowledge in a context of network relationships (Chen et al., 2009; Müller-Seitz, 2012), (b) organizational adaptation (Mathyssens et al., 2005), (c) exploitation of R&D knowledge (Newey and Shulman, 2004), and (d) technological acquisitions (Haro-Dominguez et al., 2007).

Fourth, this thesis showed that absorptive capacity mediates the relationship between organizational symbols and product innovativeness. It appears that absorptive capacity fulfills the critical success factors needed for effective product development by establishing the necessary platform to enable synergistic combination of stories, metaphors and language. It carries the indirect effects of organizational symbols on the new product development efforts through enabling the confrontation of the external inflows of new knowledge with the unconscious knowledge within the firm. Past studies explicitly investigated the mediator role of absorptive capacity in the relationship between external knowledge inflows (Kostopoulos et al., 2011), information technology (IT) implementation success (Harrington and Guimaraes, 2005), human and relational capital (Hsu and Fang, 2009), and firm innovation performance. Our findings leverage the studies of Abecassis-Moedas and Mahmoud-Jouini (2008) and Murovec and Prodan (2009) by empirically examining the role of organizational symbols as tools to acquire, assimilate, transform, and utilize knowledge and provide input to NPD efforts.

Fifth, this study demonstrated the contingent role of environmental uncertainty between the organizational symbols and absorptive capacity of organizations. It has been found that there is a positive relationship between process-based organizational stories and absorptive capacity from a lower to a moderate level of environmental uncertainty. This finding indicates that process-based organizational stories convey a more complicated message with far greater penetration than the other methods of communication, and people relay messages and impart a clear understanding of them. Interestingly, the results showed that process-based organizational stories limit absorptive capacity when there is a higher level of environmental uncertainty. This finding is consistent with the discussions of Jespersen (2012), emphasizing that uncertainty in market and environmental conditions increases the dependency of firms to factual knowledge in NPD process. Indeed, as process-based organizational stories are not populated with facts but with perceptions, assumptions and expectations, they lead to the fragmentation of beliefs and practices on the external information and events when external information is highly uncertain.

Interestingly, this study revealed a negative association between relationship-based organizational stories and firm absorptive capacity when there is less uncertainty. It appears that past stories about interactions and relationships with customers, competitors, and markets create guidelines or rigidity, and thus limit

firm's capacity to acquire, assimilate, transform, and utilize external information. However, with increasing level of uncertainty, relationship-based organizational stories positively influence the absorptive capacity. It seems that when it is hard to know customers' needs, or a competitor's strategies and technologies, firms need data and use new external information. In a sense, those stories trigger organizational improvisation and sensemaking tools to process external information, consistent with the arguments of Van den Hende and Schoorman (2012). These authors, for example, suggest that relationship-based stories enable a higher immersion into the mental imagery created. This compensates for the lack of control over discontinuities or fluctuating market conditions.

Results of this thesis also showed that the use of metaphors impacts the absorptive capacity regardless of environmental uncertainty. This designates that the use of metaphors help people to understand the complexity of external information and events, intuitively portray and imagine the environmental changes as evolving over time, uncover the unspoken or unperceived aspects of external information and events.

Further, we found that developing a common language impacts absorptive capacity by enhancing social relations and collective images of feelings, and elevating knowledge sharing regardless of environmental uncertainty. Previous studies implicitly noted the importance of common language for learning tacit as well as explicit knowledge faster and more effectively (Kleinsmann et al., 2010; Cummings and Teng, 2003), sensemaking of external knowledge (Zahay et al., 2004), and social learning interactions for the external knowledge (Sicotte and Langley, 2000; Klein et al., 1998). In this study, we provided empirical evidence that developing a common language throughout the organization helps firms to acquire, disseminate and utilize the external information regardless of uncertainty on the customer needs or competitive strategy etc. It appears that a developed common language is an open system which interacts with its environment and is in turn influenced by the environment. A developed common language does not operate near equilibrium rather it is dynamic as words or signs do not have a fixed position. Such that even though the same word may be used again and again, it will never have the same meaning as each context will be different and the individuals within the system will be different.

Also, this thesis added new insights to the discipline of knowledge management by revealing that absorptive capacity establishes the necessary platform to enable synergistic combination of data and thrives the creative and innovative capacity of the employees. Here, absorptive capacity contributes to the knowledge management strategy of the organizations through its ability to recognize the value and necessity of the externally encountered knowledge, share it across the organizational departments, transform it to a common understanding, and apply it for commercial purposes. In particular, it appears that absorptive capacity fulfills the critical success factors needed for effective knowledge management by i-) building knowledge acquisition standards on the basis of organization's unique needs, ii-) establishing a flexible and organic structure which enables easy knowledge transfer from external sources, iii-) encouraging imaginative solutions to problems by inducing conformity to organizational members, and iv) facilitating the dissemination of stored and acquired knowledge for firm activities (Conley and Zheng, 2009).

From another peripheral discipline, namely *analytical psychology* the theoretical implications of this thesis can be interpreted and enriched. The analytical psychology, in parallel term Jungian psychology has offered a critical concept for the understanding of human psychology; collective unconscious. Collective unconscious is different than unconsciousness at the individual level because it indicates the ancestral, inherited knowledge in form of archetypes which are never conscious to the human. Although unconscious, it perfectly shapes the thoughts, meanings, and actions of individuals by driving the individual psyche. I propose through this thesis that organizations have a collective unconscious at the organizational level which form as a function of individual unconscious but operate at the organizational level. The collective unconscious at the organizational level represents the reservoir of the experiences of the organizational collectivities as for the individuals collective unconscious refers to the "reservoir of the experiences of human species" (Jung, 1948). The organizational collective unconscious is manifested through organizational symbols namely; stories, metaphors and common language. They are as Jung proposes for human collectivities, the archetypes which represent the hidden knowledge, values, thought and ways of knowing and comprehending for organizational members. The collective unconscious at the organizational level therefore contributes to the understanding of organizational phenomena particularly

the ability to absorb external knowledge through allowing the uncovering, the confrontation with the underground activity, the deep structures within the organizations.

The depth of psychology provided by Freud has been offered as a critical way to emphasize the embeddedness of social processes to the human psychology in 1970's. With the emergence of Frankfurt School critical theorists (Theodore Adorno, Max Horkheimer, Herbert Marcuse etc.) the Freudian psychoanalytic theory has been applied in social sciences and particularly in organization science as an emphasis on the nature of individual psychology as a basis for the understanding of collective social/organizational processes (Bowles, 1990). However little attention has been given to the arguments made by Carl Jung, one of the most distinguished disciples of Freud. The German psychologist Carl Gustav Jung's concept of collective unconscious is used to refer to the pattern of deep unconsciousness instinctively held by all human beings which are retained in archetypes. Archetypes indicate the ancestral, inherited experiences registered collectively to human brain which reflect/manifest the collective unconscious (Carr, 2002). They structure and shape the understanding of social life and provide manageable ways, images and meanings to the chaos and complexity of external world. The contents of the collective unconscious are archetypes which are manifested in the form of organizational symbols in organizations. The archetypes are the inherent images that reflect the conventional basic patterns that are shared through the humanity and which exist across time and space (Jung, 1948).

Based on this collection of background on Jungian psychology, the idea of collective unconscious has a great deal to offer to organization theory in general and to the interaction between organizational symbols and absorptive capacity in particular. Organizational symbols represent the collectively held unconscious knowledge, values, thoughts and cognitive schemata of organizational members. They represent the reservoir of organizational hidden experiences and thinking frames. Explicitly referring to Jung, organizational symbols are the mechanisms of collective meaning centering as represented by the concept of archetype. Archetypes as suggested by Jung parallel with the concept of symbols at the organizational level. The collective unconscious of the organization is hence manifested through organizational symbols such as stories, metaphors and common language. The

evocative imagery aroused by organizational symbols constitute the critical organizational archetypes to unlock the deep structures of organizational knowledge.

This thesis offers to consider collective unconscious and archetypes not at the individual level but rather at the organizational level as a suggestion for future research. Organization as an individual unity holds a collective unconscious which owes its existence to heredity by other organizations and collectivities of organizations regardless of time and space. This system of collective unconsciousness of organizations are not based on the organizational experiences in particular but consists of the definite forms identical in all organizations which are inherited and which have never been accessible by the consciousness of the organizations. The collective unconscious at the organizational level, form as a function of collective unconscious at the individual level and consists of the pre-existent forms of knowledge and meaning manifested through organizational symbols namely archetypes. These arguments suggest that organizational phenomena, particularly the capability to absorb new external knowledge is shaped by a high degree from the inherited, instinctual drive apart from the rational conscious motivations of the organizations.

Based on the "individuation" concept offered by Jung, indeed human beings can achieve a greater understanding and knowledge about the self and hence higher degree of external relationships if they recognize and integrate the unconscious contents of their psyche (Bowles, 1990). Translating this to the organizational context, organizations holding a collective unconscious, through symbols (e.g. stories, metaphors, common language) and symbolic actions (e.g. story-telling metaphor usage, common language development) allow the confrontation of the collective unconscious. Hence, as the individuation process which enables a thorough understanding of the self, organizations develop a deeper understanding of its unseen inherited knowledge and leverages its relationship with the outside in terms of external knowledge acquisition, assimilation, transformation and utilization.

7.1. Managerial Implications

Based on this thesis, management should generate strong links with the outside environment, encourage professional relationships with other firms, establish network alliances to access alternative knowledge sources, and increase knowledge

sharing through involvement in continuous cooperation efforts. In addition, management should concentrate on the homogeneous diffusion of knowledge throughout the firm and establish a trust-based and collaborative environment so that people and departments in the firm can exploit existing and newly acquired knowledge.

Building on the results of this thesis, management should provide a work environment where organizational knowledge base, standard procedures, and routines are enhanced. Here, organizations should become aware that they should effectively manage existing tacit knowledge within the boundaries of the firm to continuously create new knowledge and combine it with the existing one, which results in successful innovations. Also, management should emphasize the storage of factual knowledge, and processed outcomes within declarative memory, aiming to improve the ability to recognize various patterns of external knowledge, and associate the encountered knowledge with the missing knowledge. Next, management ought to encourage the dissemination of emotional experiences throughout the organization to develop the knowledge base, routines, and skills. A good way of succeeding this may be continuously investing in activities which leverage interpersonal relationships, social connections, and establish emotions-based stories.

Also, management should use organizational symbols to leverage the firm's absorptive capacity. In this respect, managers should disseminate organizational process-based stories verbally and through organizational databases and websites to employees. Those stories should also be embedded in organizational routines, workplace ecology, and pictures. At the same time, management should not be completely blind to some organizational stories, such as relationship-based stories. Management should help people to evaluate key questions about those stories, such as: how the message about what needs to happen is clear, how well the story strengthens absorptive capacity, and how strongly the story motivates people to be part of the organization's future. Furthermore, management should encourage employees to use heuristic metaphors in their daily work to create meaning and interpretative platform for environmental changes and firm strategies. However, the extensive use of "metaphorical speak" should also be restricted. Finally, a common language should be used among people via the use of symbols, pictures, drawings, and signage systems.

7.2. Limitations and Future Research

The study has some methodological limitations. Specifically, the cross-sectional nature of the research design does not really enable us to study real causality between the different variables studied and to specify the changes in measures over time. For instance, stories, metaphors, common language and knowledge can be expected to change over time as new information and experiences are acquired through direct interaction with customers, performance feedback and other factors. In this respect, a longitudinal design can be used for future researches. A longitudinal design can shed light on feedback effects, and reverse and non-linear relations among absorptive capacity process, organizational symbols and product innovativeness.

Also, using a self-report data may lead to common method variance problem. Although the tests conducted imply that the presence of common method is negligible in the current thesis, the issue may still exist. Specifically, this thesis is prone to common method bias since the same respondents answered the dependent variable and independent variable, in a cross-sectional manner. This potential problem is checked with the Harman one-factor test (Podsakoff and Organ, 1986). The results of an unrotated principal component analysis indicate that common method variance is not a problem because several factors with eigenvalue greater than 1 were identified – explaining 71.09 % of the total variance, and because no factor accounts for almost all of the variance (i.e., highest single variance extracted is 31.24%). Future research could benefit from using objective measures of variables (e.g., numbers of new products developed and launched in last five years, profitability and market share of new products) to leverage the validity and reliability of the study.

Next, although the organizational symbols variables (e,g., stories, metaphors and common language) have been defined as precisely as possible by drawing on relevant literature and theoretical underpinnings through a careful process of item generation and refinement, and then validated by academics and practitioners, they can realistically only be thought of as proxies for an underlying latent phenomenon that is itself not fully measurable.

Further, due to the nature of data, the generalizability of sampling is another limitation of this study. The empirical study conducted in this thesis concerns a specific national context; Turkish firms in general and in the Istanbul district in particular. It is important to note that readers should be cautious when generalizing the results to different cultural contexts. In this regard, a Turkish sample involving Istanbul district, like that of any culturally bound research, be it a major industrialized city in the U.S., Europe or Asia, etc., imposes some constraints on the interpretation and application of the results. In this regard, a Turkish sample and culture imposes constraints on the interpretation and application of the results. Indeed, telling organizational stories, metaphors and common language is created and performed by people, who creatively produce meaning within the contextual frame of pre-existing "communicative norms" of a society (Welch and Piekkari, 2006). Different cultural contexts, countries or geographical areas, can be targeted to validate the results for a broader spectrum of cultures and geographies.

Finally, the selected sample and its size is the another limitation of this study. To validate the results of the study and increase the sample size, future research could focus on a wider range of industries and types of firms (e.g., firms in mature industries, more local firms, small sized firms etc.). For example, sampling of the study, e.g., firms with frequent or continuous product/service innovation, may cause to overestimate the value of path coefficients between absorptive capacity and product innovativeness.

In this thesis we emphasize that the concept of absorptive capacity triggers the opportunity for future researches. For example, the extent to which organizational structure, social relationships, trust among people, organizational memory level and dispersion, and organizational culture facilitate or inhibit the establishment of absorptive capacity in organizations can be investigated. Additionally, the use of IT for the development, maintenance, and use of absorptive capacity is still a matter of concern for managers and may be included in development of the model. Also, the role of absorptive capacity on the other types of organizational innovativeness, such as market, behavioral and strategic innovativeness, and firm's technological and market sensemaking capacity can be investigated.

Also, the model in this study does not capture alternative mediators that may possibly influence the relationship between organizational symbols and product innovativeness, such as organizational learning and organizational responsiveness. In

addition, organizational contingencies, such as management style, processes, and power, may be considered to capture any potential moderating effects in the model.

Besides, the linkage between absorptive capacity as the capability to absorb external knowledge and organizational symbols as the manifestations of inherited unconscious knowledge which collectively centers the organization on the shared meanings constructed garners a research opportunity from the standpoint of analytical psychology. Analytical psychology refers to the Jungian psychology which puts a particular emphasis on the role of symbolic experiences in the human life which unconsciously hold the knowledge and meanings. Analytical psychology and particularly the most distinctive part of Jung's contribution to the understanding of human collectivity; the *collective unconscious* can be offered as framework to understand the organizational life which not only contains rational aspects or structures as suggested by the machine model but rather entails the dialectic existing between the organizational members and throughout the organization resulting in consciously or unconsciously held collective knowledge and meaning.

7.3. Conclusion

Absorptive capability is one of the firm's core competencies and researches on it should be enhanced. In this study, we investigated how the firm's past experiences in the form of stories, metaphors and language is related to its absorptive capacity. The results showed that organizational symbols are related to the firm's absorptive capacity and that absorptive capacity is positively associated with firm's product innovativeness. Also, the results demonstrated that absorptive capacity mediates the relationship between organizational symbols and firm product innovativeness.

Absorptive capacity is one of the main drivers of product innovation in firms. However, how a firm's absorptive capacity can be translated into its new product development efforts and how different absorptive capacity variables can be leveraged to drive product innovativeness is missing and should be further elaborated in the NPD literature. In this thesis, the role of absorptive capacity on the firm's product development endeavors is empirically investigated. It is shown that absorptive capacity variables have differential and simultaneous effects on firm product development efforts in particular. It is emphasized that most of the research regards

absorptive capacity as a uni-dimensional construct and measures it through R&D based proxies thus diminishing the value it can offer from differing perspectives. Although we do not hold that this underestimation of the construct is intentional, it becomes apparent that it results in restraining the research on absorptive capacity to offer limited explanation to "why some firms are better able to leverage their product innovativeness through higher absorptive capacity?" However, distinguishing between different dimensions of absorptive capacity may proves to be fruitful in understanding the process-based and dynamic capability view of absorptive capacity. Hence, this thesis succeeds to show that distinct absorptive capacity variables have differential effects on product innovativeness in particular, as well as differentially related with its antecedents; particularly organizational symbols. This important inference is also echoed in the empirical literature such that the different dimensions of absorptive capacity have distinct antecedents and complement each other in affecting product innovation outcomes (Ebers and Maurer, 2014).

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BIOGRAPHY

Ipek KOCOGLU who was born in 05.10.1985 in Istanbul, after completing the middle school in Italian High School (Liceo Italiano) in 2000, has graduated from V.K.V. Koç High School in 2004. She has earned her B.S. degree in 2008 from Sabanci University Manufacturing Systems Engineering.

She has started her Master of Science in Institute of Social Sciences, Strategy Department, at Gebze Institute of Technology, right after her graduation from the university. In the meantime she has worked in a project funded by Scientific and Technological Research Council of Turkey (Tubitak) on "E-Logistics in Turkey's Grocery Retail Chains" at Sabanci University, for two years. She has received her M.S. degree in 2010 in Science and Technology Strategies at Gebze Institute of Technology.

She has started her PhD studies in the Institute of Social Sciences, Management Department at Gebze Institute of Technology in 2010 and took the first steps into her career in academia as a research assistant in 2011 at the Strategy Department. Meanwhile she worked in a project funded by Scientific and Technological Research Council of Turkey (Tubitak) on "Technological Innovation Capabilities" pursued by Gebze Institute of Technology till 2012.

She is currently working as a research assistant in Gebze Technical University, Faculty of Business Administration, Department of Strategy. She is has advanced professional competency in English and Italian languages.

APPENDIX

Appendix A: Measures

* denotes dropped item

Organizational symbols (New)

Organizational stories – processes
We have many stories about:
S1: Our product development efforts throughout the organization.
S2: Our process implementation efforts throughout the organization.
S3: Our business processes throughout the organization.
S4: Our technological knowledge throughout the organization.
S5: Our market knowledge throughout the organization.
S6: Our technology strategy implementations throughout the organization.
S7: Our marketing strategy implementations throughout the organization.
S9: Our firm's creative actions.
S8: Production processes throughout the organization.*

Organizational stories – relationship
We have many stories about:
S10: The interactions with our customers throughout the organization.
S11: The relationship with our competitors throughout the organization.
S12: Interdepartmental relationships in our firm throughout the organization.
S13: Trading relationships with other firms throughout the organization.
S14: Our managers' business experience throughout the organization.
S15: Product markets throughout the organization*

Heuristic metaphors
The extent to which metaphors are used:
M1: In product development efforts.
M2: To understand technological changes in the external environments.
M3: To create meaning and images about the business situations.
M4: To create interpretative platforms for technological change.
M5: To create interpretative platforms for market change.
M6: As a vehicle in search of new technological meanings for firm strategies.
M7: As a vehicle in search of new managerial meanings for firm strategies.
M8: As a vehicle in search of new customer meanings for firm strategies.

Generative metaphors
The extent to which metaphors are used:
M9: To leverage employee creativity.
M10: To enhance communication among people.
M11: To enhance information dissemination throughout the organization.
M12: To leverage the imagination of people in the organization.
M13: In customer-related problem-solving efforts.*

Common language

A common language is developed:

L1: To enhance collective images of feelings during the interactions.

L2: To allow people to categorize experiences and assign meaning to those experiences.

L3: To enhance social relations.

L4: To help people digest the environment, such as technological and market cues.

L5: To help people articulate their surroundings.

L6: To stimulate conversations and dialogues among different functions or departments.

L7: To elevate knowledge sharing among people.

L8: To elevate knowledge disseminating among people.*

L9: To help people understand each other in the workplace.*

Absorptive Capacity (Adapted from Camisón and Forés, 2010)

When responding to the following items, consider the firm's capacity to value, identify, acquire, assimilate, transform, and apply new external knowledge. Evaluate the strength of the firm's competitive position for each item in relation to the average for direct competitors on a scale of 1 to 5, where 1 is much worse than competitors, 3 is on a par with competitors, and 5 is much better than competitors.

Acquisition

AQ1: Capacity to capture relevant, continuous, and up-to-date information and knowledge on current and potential competitors.

AQ2: Degree of management orientation toward waiting to see what happens, instead of concern for and orientation toward the environment to monitor trends continuously and broadly and to discover new opportunities to be exploited proactively.

AQ3: Frequency and importance of cooperation with R&D organizations—universities, business schools, technological institutes—as a member or sponsor to create knowledge and innovations.

AQ4: Effectiveness in establishing programs oriented toward the internal development of technological acquisition of competences from R&D centers, suppliers, or customers.

Assimilation

AS1: Capacity to assimilate new technologies and innovations that are useful or have proven potential.

AS2: Ability to use employees' level of knowledge, experience, and competencies in the assimilation and interpretation of new knowledge.

AS3: Firm’s benefits when it comes to assimilating basic key business knowledge and technologies from the successful experiences of businesses in the same industry.

AS4: Ability to develop knowledge management programs, guaranteeing the firm's capacity for understanding and carefully analyzing knowledge and technology from other organizations.

AS5: Degree to which company employees attend and present papers at scientific conferences and congresses, are integrated as lecturers at universities or business schools, or receive outside staff on research attachments.*

AS6: Attendance at training courses, trade fairs, and meetings.*

Transformation

TF1: Capacity of the company to use information technologies to improve information flow, develop effective sharing of knowledge, and foster communication between members of the firm, including virtual meetings between professionals who are physically separated—Internet B2E portals, email, tele-working.

TF2: Firm's awareness of its competences in innovation, especially with respect to key technologies, and capability to eliminate obsolete internal knowledge, thereby stimulating the search for alternative innovations and their adaptation.

TF3: Degree to which firm prevents all employees from voluntarily transmitting useful acquired scientific and technological information to each other*.

TF4: Capacity to adapt technologies designed by others to the firm's particular needs.

TF5: Capability to coordinate and integrate all phases of the R&D process and its inter-relations with the functional tasks of engineering, production, and marketing.

Utilization

UT1: The organization's capacity to use and exploit new knowledge in the workplace to respond quickly to environment changes.

UT2: Degree of application of knowledge and experience acquired in the technological and business fields prioritized in the firm's strategy that enables it to keep itself at the technological leading edge in the business.

UT3: Capacity to put technological knowledge into product and process patents.

UT4: Ability to respond to the requirements of demand or to competitive pressure, rather than innovating to gain competitiveness by broadening the portfolio of new products, capabilities, and technology ideas.

Firm product innovativeness (Adapted from Wang and Ahmed, 2004)

P1: In new product and service introductions, our firm is often first-to-market.

P2: Our new products and services are often perceived as very novel by customers.

P3: New products and services in our company often put us up against new competitors.

P4: In comparison with competitors, our company has introduced more innovative products and services during the past five years.

P5: In comparison with competitors, our company is faster in bringing new products or services into the market.

Environmental uncertainty (adapted from Jaworski and Kohli, 1993)
In our industry;

E1: It is hard to know customers' needs.

E2: It is hard to understand competitors' strategies.

E3: It is hard to predict competitors' product announcement.

E4: It is difficult to acquire technology.

Technology changes rapidly.*