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IDRC Editors

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Introduction and Welcome

The Editors

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Regards,

Editorial Board of the JIDR

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Economic Crisis and Knowledge Asset Dynamics

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Dr. Eggert Claessen is the Managing Director of Frumtak, an Icelandic investment fund focusing on post seed start-ups and innovation companies. He has an extensive experience in founding and running start-ups, especially in the IT sector. Dr. Claessen has been an active member of the IT industry in Iceland and has worked on various projects on behalf of the IT industry, the last one as the chair of the Icelandic Association of IT Companies. He has also been active and worked on research on Intellectual Capital and has participated in various international projects on the subject. Dr. Claessen has been a part time teacher at the University of Iceland for the last ten years, teaching International Business and Knowledge Management.

Abstract

Purpose

Organizational knowledge assets have been identified as sources of competitive advantage. Knowledge asset dynamics describe how knowledge assets interact with each other through learning mechanisms enabling the generation of new knowledge that can serve as building blocks in improving the competencies of an organization. The concept of dynamic capabilities demonstrates the important role of dynamics in explaining how competitive advantage is created. The literature identifies three elements of these dynamics as being people, processes, and relations, often referred to as intellectual capital.

Design/methodology/approach

This paper aims at explaining the relationship between these elements by looking at an industry within an economy that suffered a severe blow as a result of the worldwide financial meltdown in 2008. This economy had enjoyed the good times of 2005-8 but now suffered the biggest depression since before 1900. An industry pillar had vanished as there was a total collapse of the financial sector which accounted for 6-8% of GDP. This meant a new type of recession which was characterized by enormous asset devaluation, huge increase in foreign debt and no

access to foreign credit. The assets devaluation alone was close to three times GDP. There was a total collapse of the stock market as the index went from 9016 to 819 and real-estate values dropped over 30%.

Originality/value

This demonstrates how dynamic capabilities can shape and systematically reconfigure organizational competencies, through assimilating new knowledge and linking, organize and integrate the generated knowledge into organizational routines that create new competitive advantage within clusters.

Practical implications

The paper argues that when one element of intellectual capital (relations) is destroyed, the remaining capitals (human and structural) are put to the test. Depending on the strength of these elements, they find new avenues for creating new relationships, in this case a new industry cluster.

Keywords – Knowledge Asset Dynamics, Dynamic Capabilities, Intellectual Capital, Competitive Advantage, Economic Crisis, Industry Clusters

Paper type – Academic Research Paper

Introduction

Today, the economic scenario is fast changing and complex. The importance of traditional economic and production factors as the engine of value creation dynamics in firms is decreasing. More and more, organizational knowledge assets, or intellectual capital, have been identified as the main source of competitive advantage (Edvinsson and Malone,1997; Roos, Pike et al., 2005). The change, following the advances in technology and market access, in competitive advantage is not in the access to resources, but how these resources are leveraged. Businesses have become more knowledge intensive and the success of companies is determined by how well they leverage the organization's knowledge assets (Wernerfelt, 1984; Barney, 1991; Grant, 1991; Rumelt, Schendel et al., 1991; Penrose, 1995). These knowledge asset dynamics describe how knowledge assets interact with each other through learning mechanisms

enabling the generation of new knowledge that can serve as building blocks in improving the competencies of an organization.

The traditional resource based view which originates to Penrose (1959) has made a considerable contribution to the strategic management literature. This is demonstrated in a study by Ramos-Rodríguez and Ruíz-Navarro (2004). Their bibliometric study of the Strategic Management Journal articles over the period 1980 to 2000, showed that both Wernerfelt (1984) and Barney (1991) papers, had a big impact on strategy research in the period of the study, or 12th and 13th place respectively. Ramos-Rodríguez and Ruíz-Navarro (2004:1001) go as far as to state in their paper that "Recently, the most important contribution to the discipline proves to be the resource-based view of the firm." Rugman and Verbeke (2002) consider the main contribution of the resource based view as possibly the ability to bring together several strands of research in economics, organization science and strategy. They identify four characteristics from the academic work on the resource based approach to strategic management after 1980. These are; that the objective of the firm is to achieve sustained higher returns than rivals, that the precondition to these returns is a set of resources that is not equally available to all firms, that competences and capabilities lead to sustained superior returns to the extent that they are firm specific; and that innovations in terms of new resource combinations can substantially contribute to sustainable superior returns. Similarly, Peteraf (1993) looked at the resource based view as the cornerstone of competitive advantage. She looked at the existing perspectives of the resources based view and competitive advantage such as the work of Penrose (1959); Wernerfelt (1984); Dierickx, Cool et al. (1989); Barney (1991); Rumelt, Schendel et al. (1991), and others and integrated it into a parsimonious model of resources and firm performance. The model was based on four conditions that underlie sustained competitive advantage. The first condition was resource heterogeneity in the underlying production across firms as described by Barney (1991) and productive factors having instrinsically different levels of efficiency where some are superior to others, implying that firms with superior resources will earn rents. The second is ex post limits to competition as a sustained competitive advantage, requiring the preservation of heterogeneity in a way that subsequent to gaining a superior position and earning rents for the firm, there must be forces that limit competition. The third is imperfect resource mobility as it ensures that the rents are bound and shared by the firm. This immobility is when resources cannot be traded. This can be for various reasons as discussed by Dierickx, Cool et al. (1989). The fourth is ex ante limits to

competition that prevents costs from offsetting the rents. Before a firm can establish a superior resource position, there has to be limited competition for that position. Peteraf (1993) stresses that even though the model is intended to highlight the importance of each of these conditions as playing a particular role in creating rents; they are not entirely interdependent but related. She finally points to the importance of understanding that a strategy seeking competitive advantage also depends on the skill and how superior resources are employed. In later work, (Peteraf and Bergen, 2003), she adds the work of Amit and Schoemaker (1993) and Collis and Montgomery (1997) to her literature base when discussing the premise that rival firms compete on the basis of their resources and capabilities. The main assumption is that the resource based view not only furthers the theory of competitive advantage but also the attainment of competitive advantage as the typical resource type rareness is not the only thing that matters, but resource functionality. This affects understanding of how resource substitutes are determinants of competitive advantage, independent of whether they are sustainable or not.

These limitations to the resource based view have been identified by authors such as Miles and Snow (1978); Fiol (1996); Henderson and Mitchell (1997); Das, Handfield et al. (2000); Barney, Wright et al. (2001); and Priem and Butler (2001). The main concern is that the external environment is not taken into account in terms of achieving and maintaining competitive advantage. Teece, Pisano et al. (1997) addressed this question posed by Rumelt, Schendel et al. (1991) as the most important question in the field of strategic management, i.e. how firms achieve and sustain a competitive advantage. Their answer is in the Teece, Pisano et al. (1997) dynamic capabilities framework. This framework analyzes the sources and methods of wealth creation and capture by private enterprises in an environment of rapid technological change. They see the competitive advantage as resting on distinctive processes in the firm shaped by specific assets such as intellectual capital. The sustainability of the competitive advantage is dependent on the stability of market demand, and the ease of internal expansion and replication by competitors. It further depends in large on leveraging internally the technological, organizational, and managerial processes inside the enterprise. They conclude by saying that identifying new opportunities and organizing effectively and efficiently are more important than engaging in business conduct that keeps competitors off balance, raises costs of rivals, and excludes new entrants.

The concept of dynamic capabilities demonstrates the important role of dynamics in explaining how competitive advantage is created. The literature identifies three elements of these dynamics as being people, processes and relations, often referred to as knowledge assets or intellectual capital (Roos, Pike et al., 2005). The strategic importance as well as the role of knowledge assets as key value drivers for company's competitiveness has been identified by authors such as Dierickx, Cool et al. (1989); Sveiby (1997); Teece (1998); Teece (2000); Boisot and MacMillan (2004); and Carlucci, Marr et al. (2004). However, only a few have investigated the mechanisms by which these assets contribute to create value. The problem lies in particular how to disentangle those mechanisms and how to explain how knowledge assets are clustered and how their dynamics improve organisational performance. By observing these dynamics, it is almost intuitive that knowledge assets operate as a bundle of assets, and as such have an impact on organisational performance, but it seems difficult to understand how they interact and impact.

The question is whether the possession of bundles of these strategic assets is sufficient to sustain any competitive advantage, especially in situations of rapid and unpredictable market change, i.e. dynamic markets. Teece, Pisano et al. (1997) and Eisenhardt and Martin (2000) point to a logical answer being that competitive advantage in today's economy depends upon the way firms manage their knowledge assets, and how effective and efficient their knowledge management processes are applied to accumulate, articulate, codify, and use knowledge assets to create value and enhance performance over time. In Carlucci, Marr et al. (2004) it is shown that managing knowledge assets impacts business performance. It is further argued that business performance is the value generated by the organization. The generated value is the result of an organization's ability to manage its business processes and the effectiveness and efficiency of performing organizational processes are based on organizational competencies. Finally, the management of knowledge assets enables an organization to grow and develop these organizational competencies. Therefore, the fact that organizational competencies are based on the effective and efficient management of knowledge assets puts it at the heart of business performance and value creation. Similarly, the effectiveness of knowledge asset management provides firms with an ability to constantly reconfigure, accumulate, and dispose of knowledge resources to meet the demands of a shifting market.

Even though the work of Penrose (1959) has been used to explain profit maximization as the underlying rationale for guiding the behaviour of firms, with the pursuit of rent as an objective, Rugman and Verbeke (2004:769) argue that this influence on the resource-based field "has only partially been as she intended". They claim that the interest was rather in describing the process of firm growth that was driven by entrepreneurs seeking to exploit business opportunities, and how rents in the sense of excess profits, was observed. They further state that her intention was not to develop a resource based view for firms to strategically earn rent but to concentrate on explaining the complexities associated with the assessment of how firm-level and industry-level impact societal welfare. As for nations, clusters and local production systems, these develop according to a path that is commonly characterized by different economic and production success models. In order to explain why some of them are more successful than others, economists have traditionally focused their attention mainly on natural, physical and financial resources. Recently, because of wide acknowledgement of the strategic role of intangible resources for organizational success, researchers and policy-makers have been inquiring the position and the relevance of knowledge resources as sources of local and regional development dynamics. This is in line with the assumption that a global economy region's success is increasingly based on the ability of its stakeholders to develop, maintain and exploit unique and differentiating competencies and resources. It is argued that the definition and explanation of the development of nations and clusters needs to reach well beyond concern with hard productivity to consider several other dimensions of growth, particularly non-economic dimensions, such as cognitive, social, cultural and institutional factors. This is in line with the micro-economic based strategic approaches to competitiveness, i.e. the resource based-view, the competence based-view and the knowledge based-view. These theory approaches, although from different and complementary perspectives, stress that in today's economy sustainable growth is grounded on the development, acquisition, control and management of key assets which are strongly tied and idiosyncratic to their context (Schiuma, Lerro et al., 2008).

The paper aims at explaining the relationship between these elements by looking at an industry within an economy that suffered a severe blow as a result of the worldwide financial meltdown in 2008. In the second section, there is a description of the economic situation which is the instigator of the events under observation. In the third section, there is an introduction to a new industry organization, representing a new industry cluster, along with a case study from one of

the members, discussing the interplay between the economic crisis and the formation of the new industry cluster. Finally, in the last section there are conclusions and suggestions for future research.

Economic crisis, the case of Iceland

This economy had enjoyed the good times of 2005-8 but now suffered the biggest depression since before the year 1900. An industry pillar had vanished as there was a total collapse of the financial sector which accounted for 6-8% of GDP. This meant a new type of recession which was characterized by enormous asset devaluation, huge increase in foreign debt and no access to foreign credit. The assets devaluation alone from the bankruptcy of the banks was close to five times GDP. There was a total collapse of the stock market as the index went from 9016 to 819 and real-estate values dropped over 30%.

Economic growth slowed sharply, ending the boom that had been underway since 2004. Consumer spending dropped in response to the squeeze on real incomes resulting from the large depreciation of the exchange rate, tightening credit conditions and a deterioration in the economic outlook. Residential investment fell even more sharply, weighed down by a large stock of unsold new housing units, expectations that the large gains in real house prices in recent years would be reversed over the next few years, and more limited access to housing finance on costlier terms. Tightening financial conditions and the deteriorating outlook also weighed on business investment. Unemployment began to rise, up to 9% in February 2010 from a very low level of 1% in the same month in 2007. Inflation soared following the exchange rate depreciation and the rise in commodity prices over the past year.

This meant that after a long period of unbalanced growth, the Icelandic economy had entered a deep recession following the failure of its major banks in October 2008. Not only did the economy shrink dramatically but unemployment soared. Following a large depreciation of the local currency, inflation spiked higher, though to fall back sharply once the exchange rate effects passed through and the effects of substantial economic slack came to bear. Since the crisis, the current account deficit declined markedly leaving the government faced with difficult challenges. Apart from remedying the banking crisis, they would need to ensure that inflation did indeed fall quickly and wage setters would have to look through much of the spike in inflation resulting from the depreciation of the exchange rate in order to combat unemployment

(OECD, 2008). Wade (2009) noted that Iceland was in danger of being trapped in a vicious downward vortex of debt default, unemployment, and an exodus of people, all the more so because the whole euro-zone was likely to contract at the rate of –3 percent of GDP in 2009.

The collapse of the Icelandic finance sector was a great concern for the Confederation of Icelandic Bank and Finance Employees. Twenty per cent of their members lost their jobs according to a survey they conducted and up to 40% of those who kept their jobs were subject to up to 40% reduction in salary. The finance sector had been stigmatized and job satisfaction for those who still had their jobs was low. The survey also revealed that younger people were more successful in finding a new job and the same applied to people with higher education. This is a cause for concern as Carey (2009) noted that while banks' assets had been substantially written down based on the valuations used to reach the final compensation agreements and the banks themselves would have relatively high capitalisation levels in recognition of the considerable uncertainty over the value of their assets, it would still be necessary to move bad assets into an asset management company to reduce uncertainty about the strength of the banks' balance sheets. More importantly, the banks' operations, i.e. personnel and branch networks, remained oversized for the Icelandic market, meaning that it would be necessary to scale back operations, entailing mergers. This would create a challenge for the government as to its use of ownership stakes in the banks to maximise the sustainable value of this investment rather than to pursue other objectives such as avoiding job cuts. This could stand in the way of the necessary bank consolidation as all of these measures would help to prepare the banks for full privatisation within the next few years.

Wade (2009) thought that from a macroeconomic perspective, the economic collapse of Iceland would provide a field day for social scientists for years to come as there were a number of interesting topics that would be of interest to research. These would include issues like; how measures of “happiness”—and health—are affected when people’s livelihoods are threatened en masse and the whole economic structure is thrown in doubt, how Transparency International’s measures of “corruption” could miss the kind of neopatrimonial practices endemic to the Icelandic civil service, and how such a bureaucracy nevertheless delivered good-quality public services in many fields. Finally, to try to answer the question, how the bankers were able to zoom from obscurity to world players in less than a decade, and then to fail as they did.

Whatever the answers to these questions and others, the Icelandic economy was faced with challenges that affect every aspect of daily life. This is especially challenging to businesses as domestic demand had been heavily reduced and the finance system was unable to support the existing businesses. An increase in unemployment prompted government supported programs to stimulate entrepreneurial activity but again the challenge was shortage of funds.

Role of clusters

Porter and Ketels (2011) made the observation that when the Icelandic banking system collapsed, two and a half years earlier; it had dragged the country's economy from the heights of overheating to the lows of a deep recession. The economy had in the meantime stabilized at a lower level, and the government had gotten its budget balance so much under control that it expected to return to the global financial markets later in the year. Even though stabilization was a key factor, it was not sufficient. Iceland would need to lay the foundations for a new, more sustainable economic growth path for the future. They had as early as February 2009 published an article in the Icelandic press that set out an action agenda for the country. One of its key elements was cluster mobilization as a critical step to build on Iceland's unique assets and capabilities, stressing that Iceland needed to move beyond a backward looking debate about who was to blame for the crisis to a forward-looking collaboration to improve competitiveness. They maintained the clusters were a powerful vehicle to mobilize the private sector and guide the policy choices of government.

The idea of clusters was originally suggested by Porter (1998) where he defined clusters as geographic concentrations of interconnected companies and institutions in a particular field. These clusters encompassed an array of linked industries and other entities important to competition and included, for example, suppliers of specialized inputs such as components, machinery, and services, and providers of specialized infrastructure. Clusters could also extend downstream to channels and customers and laterally to manufacturers of complementary products and to companies in industries related by skills, technologies, or common inputs. Finally, many clusters would include governmental and other institutions such as universities, think tanks, vocational training providers, and trade associations that provided specialized training, education, information, research, and technical support within the cluster.

An example of such a cluster forming in the aftermath of the economic crisis in Iceland was the gaming cluster. The Icelandic IT industry had complained during the boom years of 2005-2008 that the financial sector had taken talent from their companies and prohibited the development of member companies. This is why it was duly noted when in May 2009 there was the first formal event hosted by the Icelandic Gaming Industry which established a new organization supposed to act as a formal network for gaming professionals in Iceland and the companies they work for. Suddenly, there were eight companies attending, introducing themselves, and provided some insight into the state of the gaming industry in Iceland which had, until 2006, only two companies claiming to be true gaming companies. Apparently, there was a new industry cluster that had some serious numbers in an Icelandic context:

- 575 people employed by Icelandic game companies
- 311 positioned in Iceland
- 120 – 150 additional people needed in the next 12-18 months (estimates)
- At least 8 companies up and running already (approx. 1 company started each year)
- 1/3 the size of the Finnish game industry (games are Finland's leading cultural export product)

The brief history of these companies starts with CCP Games, founded in the summer of 1997 with the goal of becoming a leading, massively multiplayer, game company. With the launch of EVE Online in May 2003, CCP established itself as one of the leading companies in the field, winning numerous awards and receiving critical acclaim worldwide. Dedicated to the development of cutting edge massively multiplayer games, CCP is founded on the principle of pushing the envelope and breaking new grounds on all levels. CCP is not about making copycat products with compromised quality. It is about making dreams become a reality. Massively multiplayer games are virtual realities that are about creating experiences unattainable in any other form of media which makes it a great challenge. A virtual reality is about true human interaction and true human emotions in a living and evolving world. It is CCP's belief that massively multiplayer games are the biggest revolution in computer gaming history and is dedicated to making the dream of a true virtual reality come into being. The company's mission is to attract and retain customers by providing top quality online entertainment by establishing and nurturing a trust relationship with customers both in terms of quality of content as well as quality of service. To achieve this, the company encourages respect, dialog,

interaction and co-operation on a deeper level between its employees and customers than is common in online games. Backed by an American venture fund, the company has been successful in providing a unique way for improving the quality of its products and creating an inspiring and challenging environment for talent to thrive. The company has over 300 thousand subscribers and has offices in Iceland, China, the UK and the United States.

The second largest, Betware, is a gaming solution and services vendor. The company offers a turn-key solution, gaming platform, and a large portfolio of games, mainly supplying all the software a lottery or gaming service company needs. The company has a long history in gaming, starting its operations in 1996. Headquartered in Iceland with regional offices in Denmark, Spain, Poland and Canada, the company keeps close contact with their biggest customers. Since acquiring Danish game developer Certus in 2006, the company has moved into developing skill games for the web and mobile phones. The synergy between the two companies resulted in an outstanding portfolio of over 100 games ranging from lottery products like numbers games and sports betting games, to multiplayer community games. The company is constantly researching and developing its products to keep up with industry trends with the aim to constantly exceeded client expectations and requirements for promptness, performance and productivity. As a part of this the company is a member of The World Lottery Association, the European Lotteries and is ISO 27001 certified.

The third largest, the case in point for this discussion, Gogogic, was only established in 2006 by entrepreneurs that set out to create and introduce a modern breed of game development company. Since then the company has grown to become both an exciting and influential organization based on a strong understanding of emerging gaming markets and an ability to harness communities as part of innovative game concepts. As with other start-ups in the industry, the founders still hold key positions in the company as drivers of innovation, production, entertainment, and operations. Their vision of worlds that follow players wherever they choose to be is a constant beacon, along with their dedication to build a solid brand that stands for strong values. The understanding that innovation, fun, technology and social interactions are all vital ingredients in the synergetic effect that fuels its development efforts is the key. In spite of this clear focus, the company survived its first years by taking on 3rd party development, ranging from online marketing campaigns to banners, social media, and games. Their biggest customers were advertising agencies and financial institutions, a customer base

that was supposed to be very stable but was literally wiped out in the October 2008 crash. This meant that the company had to be quick to adapt to a new reality, relying on the competencies developed from the inception of the company.

This was done by accelerating a strict strategy of moving away from 3rd party work and towards internal development over time. In doing this the company has been able to seamlessly adopt qualities that are proving useful in both near and distant future. These qualities include the ability to ship products, developing the skills needed to understand, utilize and explore online content distribution trends and influencing factors, and finally, understanding monetization and how to implement it as part of concepts and game mechanics. The company was eager to maintain and support the best possible environment to operate in. This translated into a proactive approach where the company aspired to impact its surroundings in a positive and constructive way that benefited the company, its employees, and the community. Individual employees teach courses in universities, speak at conferences, and are active in grass-root organizations that are part of its corporate environment. As an example of this, the company has established a strong bond with Reykjavik University, where the company is both a supporter of its game development competition and a highly valued partner for submitting student projects. The company played a leading role in the creation of the Icelandic Gaming Industry (IGI) association, which encompasses the collaboration between Icelandic game developers and their collective efforts for environment reform. It also increased awareness, added government support, and supplied the first chairman. The company has also worked closely with The Federation of Icelandic Industries to further the cause of Icelandic start-up companies and to advance government understanding on creative industries.

When interviewed, the CEO's of these three companies confirmed that the fall of the finance sector had provided them with access to a local talent pool, gaming companies had become a more appealing workplace and last but not least, there was increased interest by investors to fund and establish gaming companies. When asked why Iceland had an advantage when it came to gaming, they stated that the historical trait of storytelling, combined with strong education, was a potent formula for success. They also mentioned new dynamics in the marketing of games with one key component to success being the viral factor for distribution. They confirmed that having at least one strong company to lead the reputation of the industry

had prompted more companies to be founded and that the establishment of the IGI had formalised gaming as a special industry cluster.

Conclusions

The ability of a firm to succeed depends on its ability to survive and the same applies to the national economy. The dynamic capabilities framework (Teece, Pisano et al., 1997) explains this in part but other researchers have addressed similar issues in slightly different ways to explain further (Priem and Butler, 2001). The economic crisis in Iceland is an interesting window to see how these dynamics are affected when traditional monetary resources are depleted and the relational capital of an industry pillar is wiped out. The remaining capitals (human and structural) have been put to the test and found to be strong in the case of the Icelandic Gaming Industry, as they have found new avenues to create new relationships, in this case a new industrial cluster. By altering the access to resources, in this case human capital, the knowledge asset dynamics and dynamic capabilities have shaped and systematically reconfigured organizational competencies, through assimilating new knowledge, and linking, organizing and integrating the generated knowledge into organizational routines that create new competitive advantage for the companies and the national economy. In the case of the Icelandic gaming industry, a few main reasons are identified. The availability of qualified people due to massive layoffs by the finance industry provided them with an unexpected access to talent. This is supported by an underlying need for talent by the existing gaming companies. With the fall of the finance industry, gaming has become an appealing industry to work in and also from an entrepreneurial perspective as new gaming companies are established.

This applies especially to certain segments of the gaming markets, i.e. casual games and social games, where barrier to entry is very low. The iPhone from Apple has created a mass market with a very simple entry into its AppStore where the revenue split is 70/30 with 70% going to the game developer. In addition, development time can be very short so production costs are low, meaning that in order to attract attention from possible buyers, some heavy marketing is needed. As for social games, this is defined in a GP Bullhound (2010) report as being web-based games, or applications, that are similar in complexity to casual games and integrate the community-based attributes of social networks. They integrate social features to allow players to track the progress of their friends, or other members of their social graph, and play with those who may be online or offline at that time (synchronous versus asynchronous game play).

Since members are aware and affected by the actions of other friends in the game, the social networking or media platform used in social gaming contributes to the game's virality and generates social camaraderie, often making social games stickier than traditional casual games. Social games occupy a unique niche within the broader gaming ecosystem. They are driven by social interaction, rather than strategy, and have no special hardware requirements as they are played online.

Both iPhone and social games rely on their viral factor for success. The term is used to describe the growth rate, or distribution, of viral applications. To explain, a game that has a viral factor of one is not in a steady state of growth nor decline, while a viral factor greater than one indicates exponential growth and similarly a viral factor less than one indicates exponential decline. This viral factor distribution measures how many additional users, on average, a game or application will gain from each new user it acquires. For a game to be successful, it needs to have a viral factor greater than 1 in order to take advantage of viral distribution which drives exponential growth. The viral factor, in addition to its retention rate and ARPU (average revenue per user) are key components in determining the economic value of a game.

It is of interest whether the Icelandic gaming companies have exhibited and identified some core competences (Prahalad and Hamel, 1990) in the gaming space as a result of the economic turmoil. The core competences would be the collective learning in the firm, how diverse skills are co-ordinated and how multiple streams of technology are integrated. These are not just bundles of skills and technologies where the skills are being integrated in the organization in some way and not the property of individuals or small teams. They are also more than an asset as used in accounting, because they do not diminish with use. Core competences are defined as the product of the learning processes within the organization, both tacit and explicit knowledge, and have to be nurtured and protected, as knowledge fades if it is not used. They are the engine for new business development in terms of patterns of diversification and guide for market entry. In line with Barney (1991), core competences are in some sense unique and sustainable if they were to convey competitive advantage (Prahalad and Hamel, 1990) and in doing so, provide a gateway to new markets which surely seems to be the case with the Icelandic gaming companies.

The validity of these conclusions need to be viewed in light of the various perspectives on core competences as stressed by Hitt and Ireland (1985) in distinguishing between corporate wide competence and the match between a firm's and industry capabilities. As noted by Marino (1996), the source of these competences can be of various origins. Consequently, core competence has become a term with different meanings and many attempts to clarify (Walsh and Linton, 2001). It also suffers from what Priem and Butler (2001) described as the 'In search of Excellence' (Peters and Waterman, 1982) problem, where it is easy to identify, in hindsight, many valuable resources in high-performing firms. In the case of the Icelandic Gaming Industry, this can only be established by longitudinal research.

As for a possible competitive advantage attained by the Icelandic Gaming Industry, knowledge resources have many references to work dedicated to the resource-based view of the firm. Priem and Butler (2001) give an overview of both research programmes in strategic management related to the resource based view, and articles with definitions of the relationships underlying resource based view constructs. The underlying assumption in the literature is that organizations can achieve sustainable competitive advantage from resources such as information technology, strategic planning, human resource management, organizational culture, and administrative skills. It is assumed that knowledge resources play a key role in creating value or competitive advantage. Authors like Penrose (1959); Kaplan and Norton (1992); Nonaka and Takeuchi (1995); Stewart (1997); Sveiby (1997); Pitelis and Wahl (1998); and Marr, Gupta et al. (2003) have all looked at knowledge assets as an important source of competitive advantage. This observation is line with Barney (1991) except for the operations dimension which is intended to capture the invisible assets that are built through day to day operations.

Finally, there is the question of sustainability of the Icelandic Gaming Industry. The economic crisis and the demise of the Icelandic banking system have created a window of opportunity. Dierickx, Cool et al. (1989) assess the sustainability of the competitive advantage by looking at the stock accumulation or ownership of resources and developing a framework and guidelines from that. They argue that a firm that does not own the non-tradable asset that it requires and that these types of assets must be built. This limits the implementation of market strategy. As an example, a firm's reputation for quality service is built rather than bought. This is done by following a consistent set of processes and procedures, etc. over a period of time. They stated

an important premise when explaining that the sustainability of a firm's asset position hinges on how easily assets can be substituted or imitated. This imitability applies to assets if they cannot be bought in factor markets. Rivals must either attempt to imitate them by accumulating similar asset stocks of their own or substitute them with other assets. Whether imitation of a particular asset stock will be time consuming, costly, or both depend on the relative ease with which rival firms are able to accumulate a similar asset stock of their own. They further addressed imitability as an important factor in establishing a competitive advantage in relation to the characteristics of the process by which it may be accumulated. Whether the Icelandic trait of storytelling is the key and sufficient to sustain any competitive advantage remains to be answered.

References:

Amit, R. and P. J. H. Schoemaker (1993). "Strategic assets and organizational rent." Strategic Management Journal 14(1): 33.

Barney, J. (1991). "Firm Resources and Sustained Competitive Advantage." Journal of Management 17(1): 99.

Barney, J., M. Wright, et al. (2001). "The resource-based view of the firm: Ten years after 1991." Journal of Management 27(6): 625.

Boisot, M. and I. C. MacMillan (2004). "Crossing epistemological boundaries: Managerial and entrepreneurial approaches to knowledge management." Long Range Planning In Press, Corrected Proof.

Carey, D. (2009). "Iceland: The Financial and Economic Crisis." OECD Economic Department Working Papers (725): 0_1.

Carlucci, D., B. Marr, et al. (2004). "The knowledge value chain: how intellectual capital impacts on business performance." International Journal of Technology Management 27(6, 7): 575.

Collis, D. J. and C. A. Montgomery (1997). Corporate Strategy, Resources and the Scope of the Firm. New York, McGraw Hill/Irwin.

Das, A., R. B. Handfield, et al. (2000). "A contingent view of quality management--the impact of international competition on quality." Decision Sciences 31(3): 649.

Dierickx, I., K. Cool, et al. (1989). "Asset Stock Accumulation and Sustainability Of Competitive." Management Science 35(12): 1504.

Edvinsson, L. and M. S. Malone (1997). Intellectual Capital - The proven way to establish your company's real value by measuring its hidden brainpower, Judy Piatkun (Publishers) ltd.

Eisenhardt, K. M. and J. A. Martin (2000). "Dynamic capabilities: What are they?" Strategic Management Journal 21(10/11): 1105.

Fiol, C. M. (1996). "Squeezing harder doesn't always work: Continuing the search for consistency in innovation research." Academy of Management. The Academy of Management Review 21(4): 1012.

GP Bullhound (2010) "SOCIAL GAMING: THE FASTEST GROWING SEGMENT OF THE GAMES MARKET", Sector Update, March 2010

Grant, R. M. (1991). "The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation." California Management Review 33(3): 114.

Henderson, R. and W. Mitchell (1997). "The interactions of organizational and competitive influences on strategy and performance." Strategic Management Journal 18: 5.

Hitt, M. A. and R. D. Ireland (1985). "Corporate Distinctive Competence, Strategy, Industry and Performance." Strategic Management Journal 6(3): 273-293.

Kaplan, R. S. and D. P. Norton (1992). The Balanced Scorecard--Measures That Drive Performance. Harvard Business Review, Harvard Business School Publication Corp. 70: 71.

Marr, B., O. Gupta, et al. (2003). "Intellectual capital and knowledge management effectiveness." Management Decision 41(8): 771.

Miles, R. E. and C. C. Snow (1978). Organizational strategy, structure and process. New York, McGraw-Hill.

Nonaka, I. and H. Takeuchi (1995). The Knowledge-Creating Company, How Japanese Companies Create the Dynamics of Innovation, Oxford University Press.

OECD (2008). "Developments in individual OECD countries: ICELAND." Organisation for Economic Cooperation and Development. OECD Economic Outlook (84): 147.

Penrose, E. (1959). The Theory of Growth of the Firm. Oxford, Blackwell.

Penrose, E. (1995). The Theory of Growth of the Firm (revised edition). Oxford, Oxford University Press.

Peteraf, M. A. (1993). "The Cornerstones of Competitive Advantage: A Resource-Based View." Strategic Management Journal (1986-1998) 14(3): 179.

Peteraf, M. A. and M. E. Bergen (2003). "Scanning dynamic competitive landscapes: A market-based and resource-based framework." Strategic Management Journal 24(10): 1027.

Peters, T. J. and R. H. Waterman (1982). In search of excellence - Lessons from America's best-run companies. New York, Harper Collins.

Pitelis, C. N. and M. W. Wahl (1998). "Edith Penrose: Pioneer of stakeholder theory." Long Range Planning 31(2): 252.

Porter, M. E. (1998). "Clusters and the new economics of competition", Harvard Business Review, 00178012, Nov/Dec98, Vol. 76, Issue 6

Porter, M.E. and Ketels, C. (2011). "Foreword in The Icelandic Geothermal Cluster; Mapping and Mobilization", Gekon, Reykjavik,

Prahalad, C. K. and G. Hamel (1990). "The Core Competence of the Corporation." Harvard Business Review 68(3): 79-91.

Priem, R. L. and J. E. Butler (2001). "Is the resource-based "view" a useful perspective for strategic management research?" Academy of Management. The Academy of Management Review 26(1): 22.

Ramos-Rodríguez, A.-R. and J. Ruíz-Navarro (2004). "Changes in the intellectual structure of strategic management research: a bibliometric study of the Strategic Management Journal, 1980-2000." Strategic Management Journal 25(10): 981.

Roos, G., S. Pike, et al. (2005). Managing Intellectual Capital in Practice. Oxford, Butterworth-Heinmann.

Rugman, A. M. and A. Verbeke (2002). "Edith Penrose's contribution to the resource-based view of strategic management." Strategic Management Journal 23(8): 769.

Rugman, A. M. and A. Verbeke (2004). A Final Word on Edith Penrose. Journal of Management Studies: 205-217.

Rumelt, R. P., D. Schendel, et al. (1991). "Strategic Management and Economics." Strategic Management Journal 12: 5.

Schiuma, G., A. Lerro, et al. (2008). "The Knoware Tree and the Regional Intellectual Capital Index." Journal of Intellectual Capital 9(2): 283.

Stewart, T. A. (1997). Intellectual Capital - The new wealth of organizations, Nicholas Brealy publishing.

Sveiby, K. E. (1997). The New Organisational Wealth, Berrett-Koehler.

Teece, D. J. (1998). "Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets." California Management Review 40(3): 55.

Teece, D. J. (2000). "Strategies for managing knowledge assets: The role of firm structure and industrial context." Long Range Planning 33(1): 34.

Teece, D. J., G. Pisano, et al. (1997). "Dynamic capabilities and strategic management." Strategic Management Journal 18(7): 509.

Wade, R. (2009). "Iceland as Icarus." Challenge 52(3): 5.

Walsh, S. T. and J. D. Linton (2001). "The Competence Pyramid: A Framework for Identifying and Analyzing Firm and Industry Competence." Technology Analysis & Strategic Management 13(2): 165-177.

Wernerfelt, B. (1984). "A Resource-based View of the Firm." Strategic Management Journal (pre-1986) 5(2): 171.

Organisational Dynamics under a Generalized Quantum Ontology: Particle Metaphysics and the Nature of Social Reality[1]

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Abstract

The problem of an adequate organisational ontology has become apparent following recent contributions to the literature advocating a process philosophical perspective on change. Ontological concerns, however, are not exclusive to organisational and social inquiry. In physics, equivalent formal descriptions of quantum phenomena generate a perplexing dualism of uncertain ontological or epistemological character. In the field of psychophysics, the serious study of mind-matter relations, the contribution of *Generalized Quantum Theory (GQT)* offers the potential of a new schematic framework within which dynamic phenomena at the macroscopic level may be evaluated. This paper proposes the consideration of this new meta-theoretic approach by scholars in organisation science and evaluates its philosophical potential in the search for a definitive answer to the question of what reality really is.

Introduction

Van de Ven and Poole (2005: p.1377) assert that investigation of the phenomenon of organisational change is "a topic that is central and important" to the organisation science genre of social inquiry. Yet the study of organisational change and our intrinsic understanding of

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organisational reality have reached an impasse. Rejuvenation of ontological debate among scholars has only served to reify an enduring metaphysical bifurcation that has persisted since antiquity. The philosophical schism evident within the literature has given rise to a plurality of process theories that are ontologically skewed and that, subsequently, are unable to provide an adequate account of the totality of dynamic organisational transformation. In view of the centricity and importance of change phenomena to both organisational scholarship and wider science, the prevailing theoretical malaise warrants fundamental reconsideration of the existing research agenda and determination of new directions for integrated theory-building and empirical analysis.

As an extension to the contribution of Van de Ven and Poole (2005), therefore, this polemic paper argues for such a transdisciplinary reorientation of process research. Adopting as its standard what Contu and Willmott (2005: p.1646) refer to as "the controversial, problematical and insistent quest/ion of/for the real – a concern that is generally undervalued or even unrecognized" within the field of management and organisation studies – the paper reviews a burgeoning research programme in psychophysics and proposes a shared paradox as the focus for a fresh, coordinated, global research effort.

Psychophysics, in essence the study of mind-matter relations, constitutes a discrete genre of the cognitive neuroscience project. Under a preliminary "weak quantum theory" (Atmanspacher *et al.*, 2002; Atmanspacher *et al.*, 2005) – since relabelled by its originators as *Generalized Quantum Theory* (Römer, 2006; Atmanspacher *et al.*, 2009) and, henceforth, referred to here as *GQT* – recent contributions to the literature have lent support to a familiar conceptualisation of individuals as causally efficacious agents within a contingent, situated, and affective social context. Consistent with Bohr's (1934) *correspondence principle*, one of the foundational principles of the dominant Copenhagen[2] interpretation of quantum mechanics (cf. Omnès, 1999), the new axiomatic approach remains relevant at a macroscopic level. It is the author's contention that the application of *GQT* to problems of social dynamics might enable scholars in the domain of social inquiry to attempt a formal resolution of the persistent agency/structure dialectic (Reed, 2003) under a realist ontological schema.

[2] The *Copenhagen interpretation* draws its name from the location of the Institute of Theoretical Physics (renamed the Niels Bohr Institute in 1965) at the University of Copenhagen. Having founded the Institute in 1921, Bohr conducted important conceptual discussions there – particularly those held with Heisenberg – which led to numerous theoretical advances in the development of quantum mechanics (Omnès, 1999).

Accordingly, this paper is comprised of discrete thematic sections. To begin; the origin of alternative metaphysical perspectives and their problematic consequences for the evaluation of organisational dynamics is reviewed (§2). Having established the context within which the polemic is presented, the paper moves to articulate the relevance and potential of developments in psychophysics through a synoptic account of the intrinsic dualism manifest in theories of quantum mechanics. Invoking the universal principle of *complementarity*, as it was conceived by Bohr (1935), *GQT* is introduced to social inquiry as a possible framework within which a general revisionary ontology might be constructed (§3). A potential direction for research under a generalized quantum hypothesis is subsequently proposed through consideration of the opportunity for theorising managerial agency anew (§4). The open realism of *GQT* is then compared with the philosophical commitments of critical realism, as described by Bhaskar (cf. Archer *et al.*, 1998; Bhaskar, 2008), and is found to be broadly compatible (§5). The paper concludes with a summary of the stated argument (§6).

The primary contribution of this research is the statement of a rhetorical and epistemological counter-point to the dominant positions in organisation science and beyond. As remarked by Boal *et al.* (2003), a necessary feature of similar position papers is a clear juxtaposition of opposing views. Accordingly, where they enrich the developed argument, considerable use is made of direct quotations. Any emphasis, however, is that attributed by the original authors.

Ontology and Process

The nature of reality has been a matter of debate since antiquity. In the philosophical crucible of ancient Greece two, competing, 'world views' emerged which continue to dominate ontological discourse and scholarly attitudes to the interpretation of change.

The Processual Perspective

The first perspective, and the progenitor of modern process philosophy, in the Western tradition (Rescher, 1996, 2006), is that attributed to Heraclitus of Ephesus (c.544-483 BC), a philosopher of the Ionian school. The popular understanding of Heraclitus, as elaborated by Russell (2004), is that he conceived of reality as perpetual transfiguration. Of Heraclitus' justifications for his metaphysical stance perhaps the most widely cited (cf. Rescher, 1996; Van de Ven & Poole, 2005; Wasserman, 2006) is that which states: "You cannot step into the same river, for fresh

waters are ever flowing in upon you" (cited in Russell, 2004: p.52). The use of a river metaphor engenders a fluid visualisation of a turbulent reality, devoid of stasis. Rescher (2006) emphasises the ontological import of this analogy when stating that:

> As Heraclitus saw it, reality is at bottom not a constellation of *things* at all, but one of *processes*: we must at all costs avoid the fallacy of substantializing nature into perduring things (substances) because it is not stable things but fundamental forces and the varied and fluctuating activities which they produce that make up this world of ours. Process is fundamental: the river is not an *object*, but the ever-changing flow. (Rescher, 2006: p.3)

Thus, Heraclitus posits reality to be continuous in its movement. His processual maxim Πάντα ρει (*panta rhei*), or "everything flows" (Rescher, 2006: pp.3-4), asserts a dense reality of *becoming*, where perceived *being* is merely an abstract, subjective, individuation of particulars, facilitating our comprehension of the whole. Whitehead (1978: p.208), in his seminal work on the relation between process and reality, refers to the Heraclitean canon *panta rhei* as "the flux of things". It is this modern concept of dynamic and perdurant, *flux* (cf. Bergson, 1949; Priest, 1982; Chia, 1999; Tsoukas & Chia, 2002; Cule & Robey, 2004; Weick *et al.*, 2005) that has subsequently come to characterise Heraclitean metaphysics.

The intrinsic fluency (Whitehead, 1978) of Heraclitean doctrine has precipitated its application as a favoured ontological stance in the field of organisational change management (Sturdy & Grey, 2003). Renewed interest in issues of metaphysics, following the observed "ontological turn" (Fleetwood, 2005) in organisation and management studies has, however, provoked debate among scholars as to the ontological legitimacy of social organisations as *things-in-themselves*. This philosophical reflexion within the field brings into question the theoretical treatment of organisational process phenomena (cf. Beech & Cairns, 2001; Tsoukas & Chia, 2002; Chia *et al.*, 2004; Van de Ven & Poole, 2005). A consequence of the renewed ontological uncertainty has been an aforementioned bifurcation within the literature, encouraged by the implicit subjectivity of Heraclitean epistemological doctrine and its consequent denial (Goudge, 1949) of concrete, "discrete and identifiable systems/states in space-time" (Chia, 1995: p.585).

The Substantive Perspective

A second philosophical disposition, diametrically opposed to the processual visualisation of Heraclitus (Rescher, 2006), is that of the Eleatic school. Principal among the ancient

proponents of an alternative ontology was Parmenides of Elea (c.490 BC) and his successors, Leucippus of Miletus (c.440 BC) and Zeno of Elea (c.450 BC). A separate contributor to their metaphysical schema was the later philosopher Democritus of Abdera (c.420 BC) who, along with Leucippus, Russell (2004) credits with the foundation of atomism. The modern, Western, philosophical perspective derives from Plato of Athens (c.427-347 BC) and Aristotle of Stagira (c.384-322 BC). It is, however, Parmenides, a contemporary of Heraclitus, whose philosophical doctrine is taken to be the original counterpart to the processual view of reality (Chia, 1999; Rescher, 2006; Römer, 2006) and the forerunner of a substantive "*being* ontology" (Chia, 2003: p.103).

The intuitive appeal of the Heraclitean conceptualisation of change derives from its general correspondence with human sensory and perceptual experience. While our cognitive tendency is toward stability and equilibrium, since, "for most of us, our deeply ingrained habits of thought surreptitiously work to elevate notions of order, stability, discreteness, simple location, identity and permanence over disorder" (Chia, 1999: p.210), our sensory apprehension reflects a turbulent milieu (Tsoukas & Chia, 2002). We do not, however, sense this environmental discontinuity and change. Rather, we perceive it through either subliminal or conscious acts of reflective cognition (cf. Eysenck, 1996; Kayes, 2002).

Finding the Heraclitean approach to reality unsatisfactory on grounds that the senses are specious and, thus, our sensible perception is "mere illusion" (Russell, 2004: p.55); Parmenides contrived an objective metaphysics privileging the immutability of substance:

> To put the argument in a nutshell: only Being can exist; there can be no coming-to-be or passing-away, because they imply non-being; no gap or discontinuity in Being; no movement, for lack of space (= non-being); not even any qualitative change, for that would mean the not-being of what had been. *Ergo*, reality consists simply of indivisible, changeless, featureless, motionless, rock-solid Being. The whole phenomenal world with its colour, movement and impermanence must be a sham. (West, 1986: p.114)

Here, then, is the origin of the ontological fissure dividing contemporary researches into the nature of dynamic phenomena: "Heraclitus maintained that *everything* changes: Parmenides retorted that *nothing* changes" (Russell, 2004: p.55). This "antagonism between the Parmenidean and Heraclitean" metaphysics, Römer (2006: p.70) observes, "has again become an explicit subject of philosophical thought under the headings 'Substance Ontology' versus

'Process Ontology'" – what Chia (1999: p.210) refers to, respectively, as a "*metaphysics of substance*" versus a "*metaphysics of change*".

Concrete Organisations under a Substance Ontology

The orthodox ontic view of organisations, which can be seen as the 'received' view in organisation science, is characterised by "the still dominant Parmenidean-inspired *metaphysics of substance* which elevates stability, permanence and order" (Chia, 1999: p.210). Thus, organisations, under a substantive ontology, are posited to be discrete, structural, and affective socio-economic entities, identifiable as *things* in their own right and conducive to positivistic epistemology. The emphasis of this perspective is on organisations as stable enduring forms (cf. Gersick, 1991; Romanelli & Tushman, 1994; Yan, 1998; Gill & Butler, 2003) and on change as a complementary epiphenomenon (Tsoukas & Chia, 2002).

As concrete facts, the ontic referent of the orthodox philosophical stance is the organisation as either composite (cf. Pfeffer & Salancik, 1974; Brunsson, 1982; Brunsson & Sahlin-Andersson, 2000) or analogue (cf. Argyris, 1960; McNeil, 1978; Namenwirth *et al.*, 1981) of individual action. One negative effect of this objectification of organisational phenomena has been the sublation of both the social aspect to organisation (Stern & Barley, 1996) and the efficacy of the self in social settings (Jun, 2005). As objective things, scholars have tended to afford organisational entities a systemic status (cf. Daft & Weick, 1984; Ashmos & Huber, 1987; Tracy & Swanson, 1993; Boisot & Child, 1999; Pondy & Boje, 2005), in accordance with the perspectives of von Bertalanffy (1972) and Boulding (1956). This systematisation in organisational theorising (cf. Scott, 2003) has given rise to the use of classificatory approaches (Chia, 1999) in process research (cf. Bartunek & Moch, 1987; Greenwood & Hinings, 1993; Van de Ven & Poole, 1995; Nielsen, 1996; Dooley & Van de Ven, 1999) and a mereological (cf. Münch, 1998; Bortoft, 2007) concept of organisational being.

Constructed Organisations under a Process Ontology

The emergent, Heraclitean, challenge to orthodoxy, however, abandons the notion of organisations as *real* and is closely allied to postmodernist and poststructuralist epistemologies (Houldsworth, 1995; Dobson, 2001; Czarniawska, 2003; McKinley, 2003).

Fundamental to the alternative, hermeneutic, approach to organisational being and becoming is a rejection of Parmenidean substance, in favour of Heraclitean flux. This is achieved through a Bergsonian reorientation of the historical ontic perspective (cf. Bergson, 1949; Tsoukas & Chia, 2002) that has "radical consequences for our understanding of the fundamental character of organisation and change" (Chia, 1999: p.210). Scholars privileging a process ontology take change, itself, to comprise reality and assert that "physical existence is at bottom processual; that processes rather than things best represent the phenomena that we encounter in the natural world about us" (Rescher, 1996: p.2). Organisational *being*, for the social constructionist, is a purely subjective, situated, sense-made (cf. Weick *et al.*, 2005) abstraction having no ontological basis in itself.

In contrast, therefore, to the orthodox emphasis of the geo-historical, or spatio-temporal, existence of concrete organisational entities, the epistemological perspective of constructivism elevates the perception of order and difference by organisational actors. It is through "the ceaseless process of assembly, disassembly and reassembly" (Chia, 1999: p.222) that organisational identity is derived, revised, and subjectively reified. The dual experiences (Dewey, 2003) of organisational stability and change (Leana & Barry, 2000) are, thus, explained as consequences of the intellectualism of social agents – the desire to "transform the perpetual order (what our senses can apprehend) into a conceptual order (making sense of our experience through concepts)" (James, 1996; cited in Tsoukas & Chia, 2002: p.570).

The critical argument obtaining from the social-constructionist perspective on change is that organisations have no ontic validity. In essence, organisations do not exist: those who would objectify them superimpose the conceptual organisation upon a fluid reality. Rather than speaking of the process of change, therefore, we are presented with the thesis that change *is* process. All that *is*, is the continuous and indivisible flux that constitutes reality. The various spatio-temporal abstractions that are held by actors as either organisational *being* or some interceding variation are, in fact, non-existent – they are mere *images* of reality individual to the subject (cf. Morgan, 1986) and relevant only to their specific experiential domain.

Under the Heraclitean process ontology, therefore, the uniqueness of individual and collective perception appears to vindicate the importance of human agency in the construction of social reality (cf. Bhaskar, 1993, 1998c). The extant organisation science literature lends support to this observation where separate studies (e.g. Bartunek *et al.*, 1992; Gioia & Thomas, 1996; Jun,

2005; Weick *et al.*, 2005) have identified the hermeneutic role of agency within organisational morphogenesis, as theorised by Archer (1995, 1998).

Dualism in Nature

The problematical relationship between dynamical process and the nature of reality is not, however, the exclusive concern of social inquiry. In the natural sciences, the advent of quantum mechanics at the beginning of the twentieth century brought about a fundamental reconsideration of established theory and presented the scientific community with an enduring paradox. Perhaps the most accessible and widely held exemplar of this paradox is the phenomenon that is referred to, colloquially, as the 'wave-particle duality' of light (Heisenberg, 1949: esp. pp.4-11; Carmichael, 2007; Falkenburg, 2007).

The Emergence of a Shared Paradox

Huygens' proposition of light as a wave in 1690 (Huygens, 1912) and Newton's (1704) naïve hypothesis of a particulate, or corpuscular, form represent the origin of modern discourse on the nature of light. In the latter half of the nineteenth century, the electromagnetic field theory of Maxwell (1865) provided a coherent account of earlier empirical research conducted by Young (1804) and Fresnel (1826) into the wave-like properties of light. Hence, a classical wave interpretation became established as the contemporary scientific orthodoxy. At the dawn of the twentieth century, however, investigation of problems concerning black-body radiation provided the catalyst for development of a new explanatory scheme.

Presented to a series of meetings of the Deutsche Physikalische Gesellschaft, culminating on 14 December 1900, and published, in refinement, the following year, work by Planck (1901) established constant proportionality between the transmitted energy and the frequency of electromagnetic radiation yielding the relation:

$$E = h\nu$$

where:

E is the electromagnetic energy
h is Planck's (proportionality) constant (~ 6.62607×10^{-34} J s)
ν is the frequency of the electromagnetic radiation

Planck's constant, h, discretised energy absorption and emission and contradicted the classical perspective, following Maxwell (1865), which held the measure of energy to be "a continuous

spatial function for all purely electromagnetic phenomena, hence also for light" (Einstein, 1905; trans. Stachel, 2005: p.177). Encouraged by experimental data obtained by Lenard (1902) on photo-electric emission, Einstein (1905) realised the implication of Planck's contribution in his theorising of a new, quantum, interpretation of light. The observation, in 1921 by Compton (1923), of the what we now identify as the photon confirmed the validity of particulate light and Einstein's disruptive quantum hypothesis. The newly established correspondence of theory and observation presented scholars with a dilemma, alluded to by Einstein in his seminal paper when he noted that:

> The wave theory of light, which operates with continuous spatial functions, has proved itself superbly in describing purely optical phenomena and will probably never be replaced by another theory. One should keep in mind, however, that optical observations refer to time averages rather than instantaneous values; and it is quite conceivable, despite the complete confirmation of the theory of diffraction, reflection, dispersion, etc., by experiment, that the theory of light, operating with continuous spatial functions, leads to contradictions when applied to the phenomena of emission and transformation of light. (Einstein, 1905; trans. Stachel, 2005: p.178)

The enigmatic aspects of light were, indeed, perplexing. It was, however, the project from which quantum mechanics emerged in the 1920s that elaborated wave-particle duality as a both an ontological and epistemological paradox.

Complementarity: Explanation or Problematisation?

An attempted resolution of the issue of the nature of light was made by de Broglie (1923), who postulated the composite matter-wave. Subsequently, two alternative systems of explanation were derived, which established quantum mechanics as a new field of science. The first theoretical system, consisting of an abstract mathematical formalism, labelled *matrix-mechanics*, was constructed by Born, Heisenberg, and Jordan (Born & Jordan, 1925; Born *et al.*, 1926) after Heisenberg's (1925) quantum reconfiguration of classical Newtonian mechanics (Fedak & Prentis, 2009). This was followed by the equivalent approach of Schrödinger (1926), who, in contrast to Heisenberg (Bitbol, 2007), privileged observable physical quantities in his development of *wave-mechanics*. In the context of the present study, important contributions of the two theoretical dispositions are the formal systemisation of matrix-mechanics and the intuitive description of systemic states under wave-mechanics.

In wave-mechanics, *Schrödinger's equation* (Schrödinger, 1926) enabled an expression for the dynamic progression of an arbitrary wave function, ψ, to be formulated. Born (1926a, 1926b)

identified that $\psi(x)$ describes the probability that a particle associated with the wave function will be detected at a location x at some arbitrary time. More specifically, the probability of a particle being detected at x is proportional to the probability density $|\psi(x)|^2$. The probability, $P_{\boldsymbol{R}}$, for a particle to be detected in the one dimensional region R, bounded by the lower limit $\boldsymbol{R_a}$ and the upper limit $\boldsymbol{R_b}$, is, thus (cf. Omnès, 1999):

$$P_{\boldsymbol{R}} = \int_{\boldsymbol{R_a}}^{\boldsymbol{R_b}} |\psi(x,t)|^2 \, dx$$

assuming the normalisation condition:

$$\int_{-\infty}^{\infty} |\psi(x,t)|^2 \; dx = 1$$

since the probability of the particle being detected in the entire spatial region (-∞, ∞) is unity.

The integral nature of the wave function in Born's (1926a, 1926b) system, however, imparts significant epistemological consequences.

Analogous to the process of organisational change, that is of interest to this study, it is the wave function, ψ, that governs the dynamic behaviour of a quantum system. In his doctoral thesis of 1924, de Broglie (1990) had related wavelength of electromagnetic radiation to momentum such that:

$$\lambda = \frac{h}{|\boldsymbol{p}|}$$

where:

λ is the wavelength
h is Planck's constant
$|\boldsymbol{p}|$ is the magnitude of the momentum vector $\boldsymbol{p}$ in the direction of propogation of the wave

This formula enabled Heisenberg (1927) to establish a minimum lower bound to the uncertainty in the canonically conjugate variables of position and momentum, defined by the following inequality relation:

$$\Delta p \Delta q = \frac{\mathrm{h}}{4\pi}$$

where:

Δp is the uncertainty in the position of the particle
Δq is the uncertainty in the momentum of the particle
h is Planck's constant

The inverse proportionality of the accuracy of position and momentum measurements is summarised by de Broglie, who observes that:

> Every time the behaviour of the particle entity is able to manifest itself by the propagation of a plane monochromatic wave, its granular aspect disappears; and every time its behaviour can be represented by the displacement in space of a localized lump, its undulatory aspect will disappear. (de Broglie, 1990: p.79)

This phenomenal quirk, while entirely consistent with formal theory, demands an explanatory account of the dynamic conditions present at the moment of observational measurement.

In the observation of a particle, the obtained measurement represents a discrete eigenvalue of the matrix operating on the *quantum state vector* $|\psi\rangle$, with respect to a given origin – or, more simply, the evaluation of the finite value of some component of the system at a given time, based on its dynamical description. The non-commuting observable components of position and momentum are said to be maximally incompatible since they do not share any common eigenstates (Atmanspacher *et al.*, 2002; beim Graben & Atmanspacher, 2009). The act of measurement, up to the epistemic limits imposed by Heisenberg (1927), induces a metaphorical/ontological (cf. Omnès, 1999: esp. pp.53-54) 'collapse' of the underlying wave function, ψ, such that only the measured, or observed, state obtains. According to the Copenhagen interpretation, the collapse or vanishing reduction (de Broglie, 1990) of the probabilistic wave function to a single state expression has no physical basis (i.e. the wave function itself cannot be objectified). Thus, collapse is a figment of our explanatory scheme.

How, then, should we regard the ontological status of the capricious wave function and its epistemological effects? This remains an open question. Bohr (1935) sought to reconcile the classical and quantum domains by introducing the notion of *complementarity*. He suggested that waves and particles are dual components of our physical reality – mutually contingent yet mutually exclusive in their phenomenological appearance. Determination of physical observables, Bohr (1935) argued, depends upon the discrimination between alternative experimental procedures. By extension, any such discrimination between arrangements,

inevitably, modifies the behaviour of the examined quantum system through the intrinsic influence imparted upon the systemic wave function. Selection of any experimental procedure yields information regarding certain observable characteristics of the system, at the expense of our knowledge of non-commuting, or complementary, features. This epistemological consequence of the complementarity hypothesis is commonly referred to in the literature as the 'measurement' problem (cf. Falkenburg, 2007: esp. pp.161-169; Schlosshauer & Fine, 2007).

Yet the cognitive choice of scholars between possible experiments is the very praxis of scientific inquiry. *Ipso facto*, according to the Copenhagen perspective, human agency cannot be abstracted from the dynamics of our physical reality. Thus, any concept of the social agency of individuals or collectivities, to include what we might recognise as organisations, should not be considered a mere artefact of nature but should instead be regarded as an integral manifestation of the *unus mundus*. This ontological stance has been consistently advocated by Stapp (1977, 2007, 2009a, 2009b).

In her recent review of the field, Falkenburg (2007: p.265) acknowledges that "in a certain sense, the concept of wave-particle duality bridges the gap between the probabilistic interpretation and the individual subatomic processes which happen in the measurement devices." However, she contends that, in contrast to the abstract ontological emphasis placed upon complementarity by Bohr (1935), the wave-particle dichotomy remains "a meta-theoretical concept which serves to interpret the current quantum theories, or a philosophical concept" (Falkenburg, 2007: p.265). The philosophical debate surrounding the implications of quantum theory and confirmatory experimental evidence continues (cf. Omnès, 1999; Schlosshauer & Fine, 2007). Whether our contemporary epistemic limit is a consequence of semiotic or schematic issues is unclear. What is apparent is that complementarity, as a core component of the popular Copenhagen interpretation (Kiefer, 2003), persists among scholars in the natural sciences as a preferred approach to the problem of physical dualism.[3]

[3] Under alternative quantum mechanical interpretations (Schlosshauer & Fine, 2007), reduction of the wave function is either taken to be a physical phenomenon or is done away with altogether. A recent contribution to the literature has also called into question the validity of Bohr's (1935) complementarity conjecture, although the legitimacy of the inferred claims made by Afshar *et al*. (2007) is widely disputed (cf. Georgiev, 2007; Steuernagel, 2007; Jacques *et al.*, 2008). Whatever the case may be, the limitations of alternative philosophical interpretations in quantum mechanics have, thus far, prevented determination of a definitive explanatory system.

The Potential of *Generalized Quantum Theory*

For those who aspire to a definitive ontology, the complementarity exhibited by the continuous wave and the discontinuous measurement generates profound difficulties for the derivation of a coherent description of reality (Carmichael, 2007). Contemporary research in the field of psychophysics – the serious study of mind-matter relations – does, however, provide some encouragement to researchers. Of particular significance for social and organisational theorists is the recent translation of *GQT* (Atmanspacher *et al.*, 2002; Atmanspacher *et al.*, 2005) to problems of cognitive perception (Atmanspacher, 2004; Atmanspacher *et al.*, 2004; Atmanspacher & Fach, 2005; Atmanspacher *et al.*, 2009) and process dynamics (beim Graben & Atmanspacher, 2006; Römer, 2006; beim Graben & Atmanspacher, 2009) in the macroscopic domain.

The core axioms (Römer, 2006) and formal derivation (Atmanspacher *et al.*, 2002; Atmanspacher *et al.*, 2005) of *GQT* are provided elsewhere within the literature and lie beyond the scope of this paper. It is sufficient to note that, under *GQT*, a natural quantum system can be appropriately represented using a C^*-algebra, A, where the physical states, z, of a considered system, $\sum$, yield what is referred to as the "*observable algebra* of $\sum$" (Atmanspacher *et al.*, 2002: p.386). The observable states, z, represent the probability distribution, correspondent with the systemic quantum state vector, $|\psi\rangle$, for any defined observable characteristic, A, of the system. Critically, *GQT*, as construed by chief protagonists of the burgeoning project in psychophysics (cf. Atmanspacher *et al.*, 2002), shares the operationalist philosophy that is integral to the extant Copenhagen interpretation (Falkenburg, 2007). This philosophical propinquity is further enhanced by the reflection in *GQT* of Bohr's allusion to a global complementarity (beim Graben & Atmanspacher, 2009) with resonance beyond the boundary of physics (cf. Rosenfeld, 1967; Favrholdt, 1999). *GQT* contrasts with its foundational scheme in quantum mechanics, however, in four key respects (Atmanspacher *et al.*, 2005):

1) Although the absence from *GQT* of Planck's constant, or some equivalent, is consistent with the negligibility of h at the level of, classical, macroscopic phenomena, the effect of this absence is the removal of finite proportionality in the non-commutation of observables.
2) There is no complex spatial representation in *GQT* and, thus, no possibility of relating observables by means of their discrete eigenvalues. Hence, maximally incompatible

observables, A and B, are identified by their description of the complete set of possible evaluations, v_z, of the systemic state, z.

3) While the natural wave function $\psi(x)$ precipitates a probabilistic interpretation under orthodox quantum theory (Born, 1926b, 1926a), the lack of addition of observables in *GQT* eliminates any consideration of probability distributions.
4) The ontic status of uncertainty and complementarity is qualified under *GQT*. The relevant ontological or epistemological import of observational indeterminacy is established by reference to the following generalisations (Atmanspacher *et al.*, 2005):
    i. For dispersion-free state evaluations, indeterminacy is an ontic phenomenon.
    ii. For pure (individual) states, dispersive outcomes remain ontic in nature.
    iii. For composite (statistical) states, dispersive outcomes are epistemic.

Recent contributions to the literature have successfully utilised *GQT* in the analysis of psychophysical phenomena (Atmanspacher *et al.*, 2004; Atmanspacher & Fach, 2005; Atmanspacher & beim Graben, 2007; Atmanspacher *et al.*, 2009), establishing elementary agreement between the theoretical predictions of the new formalism and experimental data (cf. Atmanspacher *et al.*, 2005). Of special interest are investigations of the Necker-Zeno effect (Atmanspacher *et al.*, 2004; Atmanspacher *et al.*, 2008; Atmanspacher *et al.*, 2009), a quantum mechanical enigma consonant with the philosophical paradox of *The Flying Arrows* (cf. Priest, 2006; Mazur, 2007) as contemplated by the ancient, Zeno. These studies allude to the near possibility of obtaining a correlation between human cognitive perception and quantum dynamics. This prospect is intriguing, particularly in view of the identified significance of individual perception and behavioural rationality in organisational decision-making (cf. Brunsson, 1982; Sterman, 1989; Zajac & Bazerman, 1991; Simon, 1997).

In organisation science, of course, inquiry is undertaken at the macroscopic level of empirical reality. The diminishing effect of quantum characteristics at this order of magnitude constitutes the origin of the theoretical disjunction between quantum and classical mechanics. Yet we must consider any system of interest in its totality – motivating Bohr to uphold the pre-eminence of classical concepts via his principle of *correspondence* (Omnès, 1999). In advocating investigation of the utility of *GQT* in organisational and social analysis, therefore, the essence of this paper is in broad agreement with the objectives of the psychophysical project since:

> The idea is [...] to use elements of the *mathematical* framework of quantum theory (in particular those elements which appear when an observation of a system changes its state) and apply them to non-quantum (i.e. classical) physical systems, and eventually even to non-physical systems. (Atmanspacher *et al.*, 2009: p.136)

Theorising Managerial Agency

To promote consideration of the relevance of *GQT* to organisational dynamics, a speculative conjecture regarding the efficacy of managerial agency may be advanced, as a brief example of one potential application.

Strategic Choice as Affective Agency

In the study of organisations, the established theory of *strategic choice* (Child, 1972, 1997) identifies the contingency existing between managerial agency and organisation outcomes. Interrogating the dichotomous perception of voluntarism and determinism within organisation science, Whittington (1988) differentiated two forms of deterministic influence upon the exercise of strategic choice; environmental determinism and action determinism. While both types of constraint are prescriptive in their direction of managerial behaviour, "for action determinists, the explanation of human behaviour proceeds outwards from the action selection mechanisms of the individual actors themselves" (Whittington, 1988: p.523).

The important implication of action determinism, here, is that "actions are selected according to in-built preference and information processing systems" (Child, 1997: p.49, citing Whittington, 1988: p.524) of cognisant individual actors. Hence, whereas:

> The original analysis of strategic choice postulated that decision-makers' cognitive evaluations of the situation would be shaped by their 'prior ideology', and this drew attention to the ways that class, occupational and national socialization may shape managerial beliefs about action choices…The introduction of action determinism enriches the analysis of strategic choice because it focuses attention onto the characteristics of key organizational actors themselves, which may foreclose the degree of choice that they exercise, even in the absence of external constraints. (Child, 1997: p.51)

Managerial action is, therefore, contingent upon individual schemata, formed by actors' *perceptions* of context, and the discrete neurodynamics (Schwartz *et al.*, 2005; Atmanspacher & beim Graben, 2007; beim Graben *et al.*, 2008) that link physics and psyche (Atmanspacher, 2004; Stapp, 2007, 2009b).

Child's (1997) reflexive re-consideration of the theory of strategic choice is significant since it follows that the "process of transformational change can be described as complex and less than straightforward. It involves a complex interaction between interpretive schemes, organization actions, and organization structures" (Newhouse & Chapman, 1996: p.1010). Thus, in seeking an explanatory and inclusive account of organisation dynamics, by regarding organisational actors as mereological components of a common systemic reality, the Cartesian partition (Heisenberg, 1989) of subject and object is overcome (Stapp, 2009a). Accepting this rationale, the question is how might a generalized quantum ontology elucidate the dynamics of organisations and other social systems?

Theorising Strategic Choice under a Generalized Quantum Ontology

In the field of decision-theory, a useful methodological technique is the graphic practice of cognitive-mapping (cf. Axelrod, 1976; Huff, 1990). Decision outcomes are correlated by means of primitive vectors that provide information regarding the evolutionary direction of the system and the evaluated effect of the decision – generally expressed as being either positive, negative, or neutral (cf. Willer & Markovsky, 1993). In their most simple form, cognitive maps provide a hypothetical or empirically realised representation of dynamically associated events.

Integration within the formal structure of *GQT* of a systemic *mapping function* $(A: Z \to Z)$, where Z refers to the set of all possible system states, z (cf. Atmanspacher *et al.*, 2002; Atmanspacher *et al.*, 2005) offers the prospect of its adoption in cognitive decision analysis. Recent elaboration of the role of complementarity in *GQT* (beim Graben & Atmanspacher, 2009) has served to elucidate the potential of this dynamic operator. Specifically, in dynamical systems, the evaluation of the mapping function over the systemic phase-space, X, with respect to time, t:

> is described by a flow map $\Phi: X \to X$. In the simple case of a deterministic dynamics in discrete time, Φ maps any state x_t onto a state x_{t+1} [...] Iterating the map Φ, yields a *trajectory* of states $x_{t+1} = \Phi^{t+1}(x_0) = \Phi\big(\Phi^t(x_0)\big) = \Phi(x_t)$ for integer positive times $t \in \mathbb{N}$. (beim Graben & Atmanspacher, 2009: p.103)

Hence, if the dynamics of managerial perception can be successfully correlated with the empirical data gained from experiments on the Necker-Zeno effect it may be possible to associate the macroscopic effects of their contingent strategic choices with the dynamic function Φ. Such a ground-breaking development would have far-reaching paradigmatic

consequences as substance-process and, *ipso facto*, structure-agency divisions would be sublated under the obtained dialectic synthesis of stationary states and processual transitions (cf. Schrödinger, 1926: §9; Bohr, 1934). While the distinction between mind and brain (Schwartz *et al.*, 2005; Stapp, 2009a) would remain problematic, definition of a new, holistic, ontological interpretation of change would establish a new vista for analytical inquiry. This is a tantalising prospect and the author suggests, therefore, that investigation of the new theoretical developments in psychophysics constitutes a potentially fruitful direction in which research on the nature of management and organisations may be pursued in the future. The prize for such an endeavour being nothing less than a general unified scientific ontology.

Critical Realism as a Philosophical Compass

If *GQT* is to be adopted as a framework for the evaluation of social phenomena, some words are required on the matter of a philosophy by which any future research may be guided. Necessarily, an appropriate philosophical orientation must accommodate consideration of both the structural and agential aspects of a reality that are shared by both natural and social change phenomena. The mutual contingency and exclusivity of these complementary elements should be explicitly recognised and incorporated within a scheme that is able to address the inherent difficulties presented by the natural wave function governing the evolution of quantal systems. Crucially, the predication of *GQT* upon the scaffold of quantum mechanics predisposes any derived ontology to consider the contingent and affective role of the human observer as an integral component of studied systems.

In his analysis of the importance of environmental structure to the formation of corporate strategy, Whittington (1988) suggests that a strong symbiotic consideration of structure and agency reflects an approach consistent with realist sociology. Consequently, it is the view of the author that a critical realist research paradigm, founded upon the radical epistemic critique envisioned by Bhaskar (2008), provides a suitable philosophical platform for a new programme of research. Critical realism, in common with logical positivist/empiricist doctrine privileges an accessible, concrete, reality composed of substantive 'things' – a view that is antithetical to the neo-Kantian, interpretive, and post-modern, hermeneutic, perspectives emphasising the constructed nature of social reality. Critical realism does, however, recognise certain insights provided by postmodernist scholarship, namely: the acceptance of change and relativity (in its transactional sense); the re-emphasis of difference imparted by the particular; and the

importance of human activity in the accentuation of language (Bhaskar, 2007). Hence the reality upheld by critical realists is one that is "structured, differentiated, and changing" (Bhaskar, 2007).

The warrant for adoption of critical realism as a programmatic philosophy is, primarily, derived from four central tenets of the approach, as they were described by Bhaskar (2007) at a recent colloquium attended by the author. These criteria are: 1) a neo-Hegelian *seriousness*, where there is no division between theory and praxis; 2) critical analysis of the presuppositions underpinning the practice of science and, thus, our accepted knowledge of the world; 3) identification of inconsistency within extant theory and practice through a process of "immanent critique" (Bhaskar & Norrie, 1998: p.573), and; 4) reflexivity (Alvesson & Sköldberg, 2000) as a recognition by scholars that their access to truth is socially and structurally mediated.

Importantly, the metaphysical disjunction between causality and observation in modern quantum physics (Falkenburg, 2007) is maintained under a critical realist scheme since causal laws, or *generative mechanisms* (Bhaskar, 1998b, 1998a, 2008), are taken to be ontologically prior. Essentially, causal functions are said to be categorially independent from the mediated experiences of the observer and the relationships deduced between them. Such a view entails "that causal laws persist and are efficacious in open systems, i.e. outside the conditions that enable us to empirically identify them" (Bhaskar, 2008: p.49). The generative mechanisms to which causation is attributed are considered to be "tendencies [...] which may be exercised without being fulfilled or actualized" (Bhaskar, 2008: p.50). These metaphysical tendencies are, therefore, commensurate with possibilities or potentialities (Bhaskar, 2008) mirroring Heisenberg's (1989) Aristotelian concept of *potentia*, with which he endeavoured to explain the ontological significance of the superposition of the quantum wave function, ψ.

The implicit ontological distinction between cause and (empirical) effect gives rise to a stratified ontology, illustrated in Table 1, where causal laws reside in the domain of the real and our experience of them constitutes the domain of the actual:

	Domain of Real	*Domain of Actual*	*Domain of Empirical*
Mechanisms	✓		
Events	✓	✓	
Experiences	✓	✓	✓

Table 1: The stratified ontology of critical realism (Bhaskar, 2008: Table 1.1, p.56)

While providing a philosophical scaffold for the application of *GQT* to dynamic social phenomena, the mereological concept of the world privileged under critical realism may impart additional benefits to theorising. Specifically, it may also facilitate the incorporation within the envisaged research programme of parallel attempts to construct an alternative physical ontology (cf. Isham, 1997; Isham & Butterfield, 2000; Döring & Isham, 2008a, 2008b, 2008c, 2008d) through investigation of the mathematical formalism of topoi. A synthesis of disparate contemporary research efforts promises the potential for the emergence of a powerful, paradigmatic, programme of inquiry that transcends restrictive disciplinary boundaries.

Conclusion

Although subscribing to the critical realist philosophy of science, the author is, in another sense, an idealist. The vision of a generalized quantum perspective of the human environment is a response to the question of whether we should be able to achieve a full and complete description of the *real*. The position disclosed herein is clearly optimistic in this regard. Yet, our theoretical interpretation of the quantum domain reflects the paradox created through our analysis of social being and becoming in the macroscopic world. Is this surprising, if we accept each order of magnitude as an abstraction of the one whole? Perhaps not, but we remain devoid of a coherent, parsimonious, metaphysical explanation of the uniqueness of process and substance and their symbiotic interaction in generating the world we inhabit.

In the presentation of *GQT* as a methodological asset in the investigation of organisational dynamics, the author trusts that this paper will, in the spirit of Contu and Willmott (2005), encourage colleagues to renew transdisciplinary efforts toward a comprehensive ontology. As a preliminary step in the application of quantum principles to social inquiry, an accepted formalism must be established that is appropriate to the complexities of the subjective individual. The new reference protocol should enable the conceptualisation of a conjectural,

revisionary, generalized quantum ontology (cf. Vromen, 2004) by providing a common language that, in its semantic and symbolic construction, resolves the current, encultured, inadequacies (Heisenberg, 1989: esp. pp.113-128).

Application of *GQT* in organisational research will enrich theories of organisation through harmonisation of our theoretical language with the vernacular of natural science. Existing socio-dynamic concepts such as structuration, isomorphism, and institutionalism could, eventually, come to be related within a common paradigmatic framework to comprehensible, general, measures such as 'state', 'momentum', and 'entropy'. From a methodological standpoint, the formal system provided by *GQT* might also enable the systemic integration of qualitative, subjective, information with complementary, objectified, quantitative data. Although such speculations resonate with arguments of 'physics-envy' (cf. Mirowski, 1989) within the social sciences, it is the author's position that a single reality should, indeed, be amenable to codification and evaluation by means of a common symbolism.

In order to attempt the apprehension of the real, and to resolve the dichotomy created by existing ontologies of substance and process, it is imperative, therefore, that social science strives to establish a formalism and method that is appropriate to what reality *is*. It is the author's contention that by embracing *GQT* as a genuinely transdisciplinary meta-theory scholars may, eventually, grasp the holy grail of science in deriving a comprehensive and consistent ontology, elaborated under an *open general unified theory of reality*.

We must, however, remain cognisant of the scope of this scientific challenge, without shrinking from the task before us. A pertinent reminder of the intellectual and practical difficulties ahead is provided by the South African philosopher Errol E. Harris (1908-2009) who, in conclusion to his analysis of the relation between metaphysics and science, acknowledged that:

> The truth, the disclosure of the actual nature of the real, is the ultimate goal of science, for the achievement of which perpetual experience is examined, analysed, ordered, and systematized. [...] But what science seeks may well lie beyond its limits, and the search may well lead the mind to further phases in the scale, such as religion and philosophy, which adumbrate a fulfilment in a yet more distant and more profound beyond. (Harris, 1965: pp.492-493)

While realisation of the possibility of a single, verifiable, ontology of all things may well exceed the limits of human cognition (Falkenburg, 2007), it is, surely, a worthy aspiration for

those engaged in the theorising of organisations, atoms, and all other manner of exciting worldly phenomena?

References

AFSHAR, S. S., FLORES, E., MCDONALD, K. F. & KNOESEL, E., 2007. Paradox in Wave-Particle Duality. *Foundations of Physics,* 37 (2), pp. 295-305.

ALVESSON, M. & SKÖLDBERG, K., 2000. *Reflexive Methodology: New Vistas for Qualitative Research.* London: SAGE Publications Ltd.

ARCHER, M. S., 1995. *Realist Social Theory: The Morphogenetic Approach.* Cambridge: Cambridge University Press.

ARCHER, M. S., 1998. Realism and Morphogenesis. In: Archer, M. S., Bhaskar, R., Collier, A., Lawson, T. & Norrie, A. (eds.) *Critical Realism: Essential Readings.* Abingdon: Routledge, pp. 356-381.

ARCHER, M. S., BHASKAR, R., COLLIER, A., LAWSON, T. & NORRIE, A. (eds.), 1998. *Critical Realism: Essential Readings.* Abingdon: Routledge.

ARGYRIS, C., 1960. *Understanding Organizational Behaviour.* London: Tavistock Publications (1959) Ltd.

ASHMOS, D. P. & HUBER, G. P., 1987. The Systems Paradigm in Organization Theory: Correcting the Record and Suggesting the Future. *Academy of Management Review,* 12 (4), pp. 607-621.

ATMANSPACHER, H., 2004. Quantum Theory and Consciousness: An Overview with Selected Examples. *Discrete Dynamics in Nature and Society,* [Online]. 2004 (1), pp. 51-73. Available from: http://www.hindawi.com/GetArticle.aspx?doi=10.1155/S102602260440106X [Accessed 18 February 2009].

ATMANSPACHER, H., BACH, M., FILK, T., KORNMEIER, J. & RÖMER, H., 2008. Cognitive Time Scales in a Necker-Zeno Model for Bistable Perception. *The Open Cybernetics and Systemics Journal,* 2, pp. 234-251.

ATMANSPACHER, H. & BEIM GRABEN, P., 2007. Contextual Emergence of Mental States from Neurodynamics. *Chaos and Complexity Letters,* 2 (2/3), pp. 151-168.

ATMANSPACHER, H. & FACH, W., 2005. Acategoriality as Mental Instability. *The Journal of Mind and Behavior,* 26 (3), pp. 181-206.

ATMANSPACHER, H., FILK, T. & RÖMER, H., 2004. Quantum Zeno Features of Bistable Perception. *Biological Cybernetics,* 90 (1), pp. 33-40.

ATMANSPACHER, H., FILK, T. & RÖMER, H., 2005. Weak Quantum Theory: Formal Framework and Selected Applications. In: Adenier, G., Khrennikov, A. Y. & Nieuwenhuizen, T. M. (eds.) *Quantum Theory: Reconsideration of Foundations - 3.* AIP Conference Proceedings: Mathematical and Statistical Physics, 810. Berlin: Springer, pp. 34-46.

ATMANSPACHER, H., FILK, T. & RÖMER, H., 2009. Complementarity in Bistable Perception. In: Atmanspacher, H. & Primas, H. (eds.) *Recasting Reality: Wolfgang Pauli's Philosophical Ideas and Contemporary Science.* Berlin: Springer, pp. 135-150.

ATMANSPACHER, H., RÖMER, H. & WALACH, H., 2002. Weak Quantum Theory: Complementarity and Entanglement in Physics and Beyond. *Foundations of Physics,* 32 (3), pp. 379-406.

AXELROD, R., 1976. The Cognitive Mapping Approach to Decision Making. In: Axelrod, R. (ed.) *Structure of Decision: The Cognitive Maps of Political Elites.* Princeton (NJ): Princeton University Press, pp. 3-17.

BARTUNEK, J. M., LACEY, C. A. & WOOD, D. R., 1992. Social Cognition in Organization Change: An Insider-Outsider Approach. *The Journal of Applied Behavioral Science,* 28 (2), pp. 204-223.

BARTUNEK, J. M. & MOCH, M. K., 1987. First-Order, Second-Order, and Third-Order Change and Organizational Development Interventions: A Cognitive Approach. *The Journal of Applied Behavioral Science,* 23 (4), pp. 483-500.

BEECH, N. & CAIRNS, G., 2001. Coping with Change: The Contribution of Postdichotomous Ontologies. *Human Relations,* 54 (10), pp. 1303-1324.

BEIM GRABEN, P. & ATMANSPACHER, H., 2006. Complementarity in Classical Dynamical Systems. *Foundations of Physics,* 36 (2), pp. 291-306.

BEIM GRABEN, P. & ATMANSPACHER, H., 2009. Extending the Philosophical Significance of the Idea of Complementarity. In: Atmanspacher, H. & Primas, H. (eds.) *Recasting Reality: Wolfgang Pauli's Philosophical Ideas and Contemporary Science.* Berlin: Springer, pp. 99-113.

BEIM GRABEN, P., BARRETT, A. B. & ATMANSPACHER, H., 2008. Emergence of Macrostates from Partitions of Neural State Spaces. In: The Royal Society of Edinburgh, *Mathematical Neuroscience Meeting of The Royal Society of Edinburgh.* The Royal Society of Edinburgh, Edinburgh, 17-19 March 2008. pp.

BERGSON, H., 1949. An Introduction to Metaphysics. In: Goudge, T. A. (ed.) *An Introduction to Metaphysics.* 2nd ed. Indianapolis (IN): Hackett Publishing Company, Inc., pp. 21-62.

BHASKAR, R., 1993. *Dialectic: The Pulse of Freedom.* London: Verso.

BHASKAR, R., 1998a. The Logic of Scientific Discovery. In: Archer, M. S., Bhaskar, R., Collier, A., Lawson, T. & Norrie, A. (eds.) *Critical Realism: Essential Readings.* Abingdon: Routledge, pp. 48-103.

BHASKAR, R., 1998b. Philosophy and Scientific Realism. In: Archer, M. S., Bhaskar, R., Collier, A., Lawson, T. & Norrie, A. (eds.) *Critical Realism: Essential Readings.* Abingdon: Routledge, pp. 16-47.

BHASKAR, R., 1998c. Societies. In: Archer, M. S., Bhaskar, R., Collier, A., Lawson, T. & Norrie, A. (eds.) *Critical Realism: Essential Readings.* Abingdon: Routledge, pp. 206-257.

BHASKAR, R., 2007. Introduction to Critical Realism. In: International Association for Critical Realism, *2007 Annual Conference of the International Association for Critical Realism: Pre-conference Workshop.* Drexel University, Philadelphia (PA), 15-16 August 2007. pp.

BHASKAR, R., 2008. *A Realist Theory of Science.* 2nd ed. London: Verso.

BHASKAR, R. & NORRIE, A., 1998. Introduction: Dialectic and Dialectical Critical Realism. In: Archer, M. S., Bhaskar, R., Collier, A., Lawson, T. & Norrie, A. (eds.) *Critical Realism: Essential Readings.* Abingdon: Routledge, pp. 561-574.

BITBOL, M., 2007. Schrödinger Against Particles and Quantum Jumps. In: Evans, J. & Thorndike, A. S. (eds.) *Quantum Mechanics at the Crossroads: New Perspectives from History, Philosophy and Physics.* Berlin: Springer, pp. 81-106.

BOAL, K. B., HUNT, J. G. & JAROS, S. J., 2003. Order is Free: On the Ontological Status of Organizations. In: Westwood, R. & Clegg, S. R. (eds.) *Debating Organizations: Point-Counterpoint in Organization Studies.* Oxford: Blackwell Publishing Ltd, pp. 84-98.

BOHR, N., 1934. Atomic Theory and Mechanics (1925). In: *Atomic Theory and the Description of Nature.* Cambridge: Cambridge University Press, pp. 25-51.

BOHR, N., 1935. Can Quantum-Mechanical Description of Physical Reality Be Considered Complete? *Physical Review,* 48 (8), pp. 696-702.

BOISOT, M. & CHILD, J., 1999. Organizations as Adaptive Systems in Complex Environments: The Case of China. *Organization Science,* 10 (3), pp. 237-252.

BORN, M., 1926a. Quantenmechanik der Stoßvorgänge (trans. Quantum Mechanics of Collision Processes). *Zeitschrift für Physik A Hadrons and Nuclei,* 38 (11-12), pp. 803-827.

BORN, M., 1926b. Zur Quantenmechanik der Stoßvorgänge (trans. The Quantum Mechanics of Collision Processes). *Zeitschrift für Physik A Hadrons and Nuclei,* 37 (12), pp. 863-867.

BORN, M., HEISENBERG, W. & JORDAN, P., 1926. Zur Quantenmechanik II (trans. On Quantum Mechanics II). *Zeitschrift für Physik A Hadrons and Nuclei,* 35 (8-9), pp. 557-615.

BORN, M. & JORDAN, P., 1925. Zur Quantenmechanik (trans. On Quantum Mechanics). *Zeitschrift für Physik A Hadrons and Nuclei,* 34 (1), pp. 858-888.

BORTOFT, H., 2007. *The Wholeness of Nature: Goethe's Way of Science.* Edinburgh: Floris Books.

BOULDING, K. E., 1956. General Systems Theory - The Skeleton of Science. *Management Science,* 2 (3), pp. 197-208.

BRUNSSON, N., 1982. The Irrationality of Action and Action Rationality: Decisions, Ideologies and Organizational Actions. *Journal of Management Studies,* 19 (1), pp. 29-44.

BRUNSSON, N. & SAHLIN-ANDERSSON, K., 2000. Constructing Organizations: The Example of Public Sector Reform. *Organization Studies,* 21 (4), pp. 721-746.

CARMICHAEL, H., 2007. Quantum Fluctuations of Light: A Modern Perspective on Wave/Particle Duality. In: Evans, J. & Thorndike, A. S. (eds.) *Quantum Mechanics at the Crossroads: New Perspectives from History, Philosophy and Physics.* Berlin: Springer, pp. 183-212.

CHIA, R., 1995. From Modern to Postmodern Organizational Analysis. *Organization Studies,* 16 (4), pp. 579-604.

CHIA, R., 1999. A 'Rhizomic' Model of Organizational Change and Transformation: Perspective from a Metaphysics of Change. *British Journal of Management,* 10 (3), pp. 209-227.

CHIA, R., 2003. Ontology: Organization as "World-making". In: Westwood, R. & Clegg, S. R. (eds.) *Debating Organizations: Point-Counterpoint in Organization Studies.* Oxford: Blackwell Publishing Ltd, pp. 98-113.

CHIA, R., LANGLEY, A. & VAN DE VEN, A. H., 2004. The First Organization Studies Summer Workshop: "Theorizing Process in Organizational Research". *Organization Studies,* 25 (8), pp. 1466-1468.

CHILD, J., 1972. Organizational Structure, Environment and Performance: The Role of Strategic Choice. *Sociology,* 6 (1), pp. 1-22.

CHILD, J., 1997. Strategic Choice in the Analysis of Action, Structure, Organizations and Environment: Retrospect and Prospect. *Organization Studies,* 18 (1), pp. 43-76.

COMPTON, A. H., 1923. A Quantum Theory of the Scattering of X-Rays by Light Elements. *Physical Review,* 21 (5), pp. 483-502.

CONTU, A. & WILLMOTT, H., 2005. You Spin Me Round: The Realist Turn in Organization and Management Studies. *Journal of Management Studies,* 42 (8), pp. 1645-1662.

CULE, P. E. & ROBEY, D., 2004. A Dual-Motor, Constructive Process Model of Organizational Transition. *Organization Studies,* 25 (2), pp. 229-260.

CZARNIAWSKA, B., 2003. Social Constructionism and Organization Studies. In: Westwood, R. & Clegg, S. R. (eds.) *Debating Organizations: Point-Counterpoint in Organization Studies.* Oxford: Blackwell Publishing Ltd, pp. 128-139.

DAFT, R. L. & WEICK, K. E., 1984. Toward a Model of Organizations as Interpretation Systems. *Academy of Management Review,* 9 (2), pp. 284-295.

DE BROGLIE, L., 1923. Ondes et Quanta (trans. Waves and Quanta). *Comptes Rendus,* Tome 177 (1), pp. 507-510.

DE BROGLIE, L., 1990. *Heisenberg's Uncertainties and the Probabilistic Interpretation of Wave Mechanics: with Critical Notes of the Author* Dordrecht: Kluwer Academic Publishers.

DEWEY, J., 2003. *Experience and Nature.* 2nd ed. Whitefish (MT): Kessinger Publishing.

DOBSON, P. J., 2001. Longitudinal Case Research: A Critical Realist Perspective. *Systemic Practice and Action Research,* 14 (3), pp. 283-296.

DOOLEY, K. J. & VAN DE VEN, A. H., 1999. Explaining Complex Organisational Dynamics. *Organization Science,* 10 (3), pp. 358-372.

DÖRING, A. & ISHAM, C. J., 2008a. A Topos Foundation for Theories of Physics: I. Formal Languages for Physics. *Journal of Mathematical Physics,* 49 (5), pp. 053515-1-053515-25.

DÖRING, A. & ISHAM, C. J., 2008b. A Topos Foundation for Theories of Physics: II. Daseinisation and the Liberation of Quantum Theory. *Journal of Mathematical Physics,* 49 (5), pp. 053516-1-053516-26.

DÖRING, A. & ISHAM, C. J., 2008c. A Topos Foundation for Theories of Physics: III. The Representation of Physical Quantities With Arrows. *Journal of Mathematical Physics,* 49 (5), pp. 053517-1-053517-31.

DÖRING, A. & ISHAM, C. J., 2008d. A Topos Foundation for Theories of Physics: IV. Categories of Systems. *Journal of Mathematical Physics,* 49 (5), pp. 053518-1-053518-29.

EINSTEIN, A., 1905. Über einen die Erzeugung und Verwandlung des Lichtes betreffenden heuristischen Gesichtspunkt (trans. On a Heuristic Point of View Concerning the Production and Transformation of Light). *Annalen der Physik,* 322 (6), pp. 132-148.

EYSENCK, M., 1996. *Simply Psychology.* Hove: Psychology Press Ltd.

FALKENBURG, B., 2007. *Particle Metaphysics: A Critical Account of Subatomic Reality.* Berlin: Springer.

FAVRHOLDT, D. (ed.) 1999. *Niels Bohr: Collected Works: Volume 10: Complementarity Beyond Physics (1928-1962).* Amsterdam: Elsevier Science B.V.

FEDAK, W. A. & PRENTIS, J. J., 2009. The 1925 Born and Jordan Paper "On Quantum Mechanics". *American Journal of Physics,* 77 (2), pp. 128-139.

FLEETWOOD, S., 2005. Ontology in Organization and Management Studies: A Critical Realist Perspective. *Organization,* 12 (2), pp. 197-222.

FRESNEL, A.-J., 1826. Mémoire sur la Diffraction de la Lumière (trans. Memoir on the Diffraction of Light). *Mémoires de l'Académie Royale des sciences de l'Institut de France,* Tome 5 (Années 1821 et 1822), pp. 339-475.

GEORGIEV, D. D., 2007. Single Photon Experiments and Quantum Complementarity. *Progress in Physics,* 2007 (2), pp. 97-103.

GERSICK, C. J. G., 1991. Revolutionary Change Theories: A Multilevel Exploration of the Punctuated Equilibrium Paradigm. *Academy of Management Journal,* 16 (1), pp. 10-36.

GILL, J. & BUTLER, R. J., 2003. Managing Instability in Cross-Cultural Alliances. *Long Range Planning,* 36 (6), pp. 543-563.

GIOIA, D. A. & THOMAS, J. B., 1996. Identity, Image, and Issue Interpretation: Sensemaking During Strategic Change in Academia. *Administrative Science Quarterly,* 41 (3), pp. 370-403.

GOUDGE, T. A., 1949. Editor's Introduction. In: Goudge, T. A. (ed.) *An Introduction to Metaphysics.* 2nd ed. Indianapolis (IN): Hackett Publishing Company, Inc., pp. 9-20.

GREENWOOD, R. & HININGS, C. R., 1993. Understanding Strategic Change: The Contribution of Archetypes. *Academy of Management Journal,* 36 (5), pp. 1052-1081.

HARRIS, E. E., 1965. *The Foundations of Metaphysics in Science.* London: Routledge.

HEISENBERG, W., 1925. Über quantentheoretische Umdeutung kinematischer und mechanischer Beziehungen (trans. On Quantum Reinterpretation of Kinematic and Mechanical Relations). *Zeitschrift für Physik A Hadrons and Nuclei,* 33 (1), pp. 879-893.

HEISENBERG, W., 1927. Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik (trans. On the Intuitive Content of Kinematic and Mechanical Relations). *Zeitschrift für Physik A Hadrons and Nuclei,* 43 (3-4), pp. 172-198.

HEISENBERG, W., 1949. *The Physical Principles of the Quantum Theory.* Mineola (NY): Dover Publications, Inc.

HEISENBERG, W., 1989. *Physics and Philosophy: The Revolution in Modern Science.* London: Penguin Books.

HOULDSWORTH, E., 1995. Adopting a Social Constructivist Approach to Evaluation. In: Elfring, T., Jensen, H. S. & Money, A. H. (eds.) *European Research Paradigms in Business Studies: Papers from the First EDAMBA Summer School.* Copenhagen: Handelshøjskolens Forlag, pp. 61-78.

HUFF, A. S., 1990. Mapping Strategic Thought. In: Huff, A. S. (ed.) *Mapping Strategic Thought.* Chichester: John Wiley & Sons Ltd, pp. 11-49.

HUYGENS, C., 1912. *Treatise on Light: In Which are Explained the Causes of That Which Occurs in Reflexion, & in Refraction. And Particularly in the Strange Refraction of Iceland Crystal.* London: Macmillan and Co., Limited.

ISHAM, C. J., 1997. Topos Theory and Consistent Histories: The Internal Logic of the Set of all Consistent Sets. *International Journal of Theoretical Physics,* 36 (4), pp. 785-814.

ISHAM, C. J. & BUTTERFIELD, J., 2000. Some Possible Roles for Topos Theory in Quantum Theory and Quantum Gravity. *Foundations of Physics,* 30 (10), pp. 1707-1735.

JACQUES, A., LAI, N. D., DRÉAU, A., ZHENG, D., CHAUVAT, D., TREUSSART, F., GRANGIER, P. & ROCHE, J.-F., 2008. Illustration of Quantum Complementarity using Single Photons Interfering on a Grating. *New Journal of Physics,* 10 (123009), pp. 1-10.

JUN, J. S., 2005. The Self in the Social Construction of Organizational Reality: Eastern and Western Views. *Administrative Theory & Praxis,* 27 (1), pp. 86-110.

KAYES, D. C., 2002. Experiential Learning and Its Critics: Preserving the Role of Experience in Management Learning and Education. *Academy of Management Learning & Education,* 1 (2), pp. 137-149.

KIEFER, C., 2003. On the Interpretation of Quantum Theory - from Copenhagen to the Present Day. In: Castell, L. & Ischebeck, O. (eds.) *Time, Quantum and Information.* Berlin: Springer-Verlag, pp. 291-300.

LEANA, C. R. & BARRY, B., 2000. Stability and Change as Simultaneous Experiences in Organizational Life. *Academy of Management Review,* 25 (4), pp. 753-759.

LENARD, P., 1902. Ueber die lichtelektrische Wirkung (trans. Concerning the Photoelectric Effect). *Annalen der Physik,* 313 (5), pp. 149-198.

MAXWELL, J. C., 1865. A Dynamical Theory of the Electromagnetic Field. *Philosophical Transactions of the Royal Society of London (1776-1886),* 155 (1865), pp. 459-512.

MAZUR, J., 2007. *The Motion Paradox: The 2,500-Year-Old Puzzle Behind All the Mysteries of Time and Space.* New York (NY): Dutton.

MCKINLEY, W., 2003. Postmodern Epistemology in Organization Studies: A Critical Appraisal. In: Locke, E. A. (ed.) *Postmodernism and Management: Pros, Cons and the Alternative.* Oxford: Elsevier Ltd, pp. 203-225.

MCNEIL, K., 1978. Understanding Organizational Power: Building on the Weberian Legacy. *Administrative Science Quarterly,* 23 (1), pp. 65-90.

MIROWSKI, P. E., 1989. *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics.* Cambridge: Cambridge University Press.

MORGAN, G., 1986. *Images of Organization.* Newbury Park (CA): SAGE Publications, Inc.

MÜNCH, D., 1998. The Multidimensional Ontology of Artifacts and its Application to Complex Technical Systems. In: State University of New York, *Applied Ontology: A Martin Farber Conference on Law and Institutions in Society.* University at Buffalo, Buffalo (NY), 24-25 April 1998. pp. 1-8.

NAMENWIRTH, J. Z., MILLER, R. L. & WEBER, R. P., 1981. Organizations Have Opinions: A Redefinition of Publics. *Public Opinion Quarterly,* 45 (4), pp. 463-476.

NEWHOUSE, D. R. & CHAPMAN, I. D., 1996. Organizational Transformations: A Case of Two Aboriginal Organizations. *Human Relations,* 49 (7), pp. 995-1011.

NEWTON, I., 1704. *Opticks: or, a Treatise of the Reflexions, Refractions, Inflexions and Colours of Light. Also Two Treatises of the Species and Magnitude of Curvilinear Figures.* 2nd ed. London: Printed for Sam Smith and Benj. Walford.

NIELSEN, R. P., 1996. Varieties of Dialectic Change Processes. *Journal of Management Inquiry,* 5 (3), pp. 276-292.

OMNÈS, R., 1999. *Understanding Quantum Mechanics.* Princeton (NJ): Princeton University Press.

PFEFFER, J. & SALANCIK, G. R., 1974. Organizational Decision Making as a Political Process: The Case of a University Budget. *Administrative Science Quarterly,* 19 (2), pp. 135-151.

PLANCK, M., 1901. Ueber das Gesetz der Energieverteilung im Normalspectrum (trans. On the Law of Energy Distribution in the Normal Spectrum). *Annalen der Physik,* 309 (3), pp. 553-563.

PONDY, L. R. & BOJE, D., 2005. Beyond Open System Models of Organization. *Emergence: Complexity & Organization,* 7 (3-4), pp. 119-137.

PRIEST, G., 1982. To Be and not to Be: Dialectical Tense Logic. *Studia Logica,* 41 (2/3), pp. 249-268.

PRIEST, G., 2006. *In Contradiction: A Study of the Transconsistent.* 2nd ed. Oxford: Oxford University Press.

REED, M. I., 2003. The Agency/Structure Dilemma in Organization Theory: Open Doors and Brick Walls. In: Tsoukas, H. & Knudsen, C. (eds.) *The Oxford Handbook of Organization Theory: Meta-Theoretical Perspectives.* Oxford: Oxford University Press, pp. 289-309.

RESCHER, N., 1996. *Process Metaphysics: An Introduction to Process Philosophy.* Albany (NY): State University of New York Press.

RESCHER, N., 2006. *Process Philosophical Deliberations.* Heusenstamm: Ontos Verlag.

ROMANELLI, E. & TUSHMAN, M. L., 1994. Organizational Transformation as Punctuated Equilibrium: An Empirical Test. *Academy of Management Journal,* 37 (5), pp. 1141-1166.

RÖMER, H., 2006. Complementarity of Process and Substance. *Mind and Matter,* 4 (1), pp. 69-89.

ROSENFELD, L., 1967. Niels Bohr in the Thirties. Consolidation and Extension of the Conception of Complementarity. In: Rozental, S. (ed.) *Niels Bohr: His Life and Work as seen by His Friends and Colleagues.* Amsterdam: North-Holland Publishing Company, pp. 114-136.

RUSSELL, B., 2004. *History of Western Philosophy.* Abingdon: Routledge.

SCHLOSSHAUER, M. & FINE, A., 2007. Decoherence and the Foundations of Quantum Mechanics. In: Evans, J. & Thorndike, A. S. (eds.) *Quantum Mechanics at the Crossroads: New Perspectives from History, Philosophy and Physics.* Berlin: Springer, pp. 125-148.

SCHRÖDINGER, E., 1926. An Undulatory Theory of the Mechanics of Atoms and Molecules. *Physical Review,* 28 (6), pp. 1049-1070.

SCHWARTZ, J. M., STAPP, H. P. & BEAUREGARD, M., 2005. Quantum Physics in Neuroscience and Psychology: A Neurophysical Model of Mind-Brain Interaction. *Philosophical Transactions of the Royal Society B: Biological Sciences,* 360 (1458), pp. 1309-1327.

SCOTT, W. R., 2003. *Organizations: Rational, Natural, and Open Systems.* 5th (International) ed. Upper Saddle River (NJ): Pearson Education International.

SIMON, H. A., 1997. *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organizations.* 4th ed. New York (NY): The Free Press.

STACHEL, J. (ed.) 2005. *Einstein's Miraculous Year: Five Papers That Changed the Face of Physics.* 2nd ed. Princeton (NJ): Princeton University Press.

STAPP, H. P., 1977. Theory of Reality. *Foundations of Physics,* 7 (5/6), pp. 313-323.

STAPP, H. P., 2007. *Mindful Universe: Quantum Mechanics and the Participating Observer.* Berlin: Springer.

STAPP, H. P., 2009a. *Mind, Matter and Quantum Mechanics.* 3rd ed. Berlin: Springer.

STAPP, H. P., 2009b. The Role of Human Beings in the Quantum Universe. *World Futures,* 65 (1), pp. 7-18.

STERMAN, J. D., 1989. Modeling Managerial Behavior: Misperceptions of Feedback in a Dynamic Decision Making Experiment. *Management Science,* 35 (3), pp. 321-339.

STERN, R. N. & BARLEY, S. R., 1996. Organizations and Social Systems: Organization Theory's Neglected Mandate. *Administrative Science Quarterly,* 41 (1), pp. 146-162.

STEUERNAGEL, O., 2007. Afshar's Experiment Does Not Show a Violation of Complementarity. *Foundations of Physics,* 37 (9), pp. 1370-1385.

STURDY, A. & GREY, C., 2003. Beneath and Beyond Organizational Change Management: Exploring Alternatives. *Organization,* 10 (4), pp. 651-662.

TRACY, L. & SWANSON, G. A., 1993. Application of Living Systems Theory to the Study of Management and Organizational Behaviour. *Behavioral Science,* 38 (3), pp. 218-231.

TSOUKAS, H. & CHIA, R., 2002. On Organizational Becoming: Rethinking Organizational Change. *Organization Science,* 13 (5), pp. 567-582.

VAN DE VEN, A. H. & POOLE, M. S., 1995. Explaining Development and Change in Organizations. *Academy of Management Review,* 20 (3), pp. 510-540.

VAN DE VEN, A. H. & POOLE, M. S., 2005. Alternative Approaches for Studying Organizational Change. *Organization Studies,* 26 (9), pp. 1377-1404.

VON BERTALANFFY, K. L., 1972. The History and Status of General Systems Theory. *Academy of Management Journal,* 15 (4), pp. 407-426.

VROMEN, J., 2004. Conjectural Revisionary Economic Ontology: Outline of an Ambitious Research Agenda for Evolutionary Economics. *Journal of Economic Methodology,* 11 (2), pp. 213-247.

WASSERMAN, R., 2006. The Problem of Change. *Philosophy Compass,* 1 (1), pp. 48-57.

WEICK, K. E., SUTCLIFFE, K. M. & OBSTFELD, D., 2005. Organizing and the Process of Sensemaking. *Organization Science,* 16 (4), pp. 409-421.

WEST, M., 1986. Early Greek Philosophy. In: Boardman, J., Griffin, J. & Murray, O. (eds.) *The Oxford History of the Classical World: Greece and the Hellenistic World.* Oxford: Oxford University Press, pp. 107-117.

WHITEHEAD, A. N., 1978. *Process and Reality: An Essay in Cosmology.* 2nd ed. New York (NY): The Free Press.

WHITTINGTON, R., 1988. Environmental Structure and Theories of Strategic Choice. *Journal of Management Studies,* 25 (6), pp. 521-536.

WILLER, D. & MARKOVSKY, B., 1993. Elementary Theory: Its Development and Research Program. In: Berger, J. & Zelditch Jr., M. (eds.) *Theoretical Research Programs: Studies in the Growth of Theory.* Stanford (CA): Stanford University Press, pp. 323-363.

YAN, A., 1998. Structural Stability and Reconfiguration of International Joint Ventures. *Journal of International Business Studies,* 29 (4), pp. 773-795.

YOUNG, T., 1804. The Bakerian Lecture: Experiments and Calculations Relative to Physical Optics. *Philosophical Transactions of the Royal Society of London (1776-1886),* 94 (1804), pp. 1-16.

ZAJAC, E. J. & BAZERMAN, M. H., 1991. Blind Spots in Industry and Competitor Analysis: Implications of Interfirm (Mis)Perceptions for Strategic Decisions. *Academy of Management Review,* 16 (1), pp. 37-56.

The Main Doctor - A Longitudinal Case Study: An Aneurysm from Preliminary Warnings to Recovery

Pat Joynt

Dr. Pat Joynt has held Professor positions in management and international business in Norway, Germany, USA, UK, and Belgium. He has also served as a consultant for organizations in Norway, Sweden, Denmark, Ireland, Germany, USA and the UK in the areas of management of technology, international strategy, career planning, change management and human resources development. He has written/edited 15 books, and has had over 100 articles accepted for publication in various management journals. He has also successfully supervised 50 doctor candidates from North America to Europe, Brazil and China.

Abstract

This paper has: an international orientation, is multidisciplinary in its research using a single case methodology and action research, is part of a large report that is divided into seven sections after a common introductory section involving an introduction, a literature review and a methodology.

This project began by interacting with the main doctor involved in the three key surgeries of the patient, the hospital administrative and research staffs, my wife's doctor in Norway, as well as with the immediate family. Two international seminar presentations from earlier drafts of this paper have been made.

Case studies are very popular at the university masters level, but more difficult to apply at the doctorate level. Bevan (1997) and Homa (1999) studied the Leicester Hospital change case in the UK at the doctorate level. It was the largest funded hospital change case study at that time. Felix (1999) did a doctorate case study on the BBC. Another valuable source for case studies is the Denzin and Lincoln Handbook of Qualitative Research.

Joynt (2004) in his chapter on MBRR (Management by Research Results) integrates the concept of action research with action learning using the framework developed by Eden and

Huxham (1996). Six doctor theses cases were then reviewed using this framework. The action research framework consists of 15 action research characteristics.

This paper concludes with a short summary of the practical and theoretical contributions made. Since this is part of a larger project involving 7 themes/papers, more information is available from: patjoynt@frisurf.no

PART I

The report/book from which this paper is taken, has an international orientation, is multidisciplinary in its research using a single case methodology and action research, is divided into seven sections after a common introductory section involving a introduction, a literature review and a methodology:

International Orientation

The Joynt family has homes/cottages in the UK, USA and Norway, and the main author has had research positions in each of those areas. Much of the background and supportive research is from these three areas.

Multidisciplinary research using a single case and action research

The main author is a professor who has written many books and articles in the areas of organization behaviour, international culture, organization strategy and management development. He has supervised five doctor associates in the Health Administration area.

Divided into Sections

The entire document could be considered a small book as each section can stand on its own. The overall intention is to produce several research oriented papers as well as complete documentation for the family involved in the case. Here are the key sections that will follow this Part I in the final report:

Family support and interaction

The longitudinal case study

Suggested refinements to previous research on aneurysms

The role of the caretaker/giver

Associated behavioural changes

The role of the main Doctor involved

Conclusions

This project began by interacting with the main doctor involved in the three key surgeries of the patient, the hospital administrative and research staffs, Unni's doctors in Norway, as well as with the immediate family. Two international seminar presentations from earlier drafts of this project have been made.

The first draft of the entire report involving all six sections as well as a common Part I will come close to thrice the size of a normal published research paper; one could call it a small book or report. The report will use both the Norwegian and the English language as well as strive to meet refereed publication standards in some, but not all of the sections.

In summary, the first draft will be long, and both family and academically oriented. I expect to finish this draft within the year 2012. After that, the plan is to use some of the sections for academically oriented publications. The sections on the main doctor involved, behavioral changes after an aneurysm, the role of the caretaker, as well as the single case methodology are the prime candidates for academically oriented publications. Some of the other sections are more family oriented. Hopefully this strategy will provide a win–win situation for all parties concerned.

To meet the above challenges, the report is divided into two main parts. The first part sets the context, background and research foundations. The second part is the confidential material that is being processed and revised for general publication, essentially this involves the seven sections listed previously.

There is some duplication in the total report as some of the material mentioned in the first part are sometimes repeated in the second set of sections. An example; the section on the main doctor involved has been reviewed and is now in the process of publication. Thus this paper contains the first part of the entire report involving context, background and research foundations while the second part involves only the section on the main doctor involved. We expect to publish the other empirical sections on Behavioral Changes for the Patient and the Caretaker/giver sections in the future. They will also start with the first part of this report followed by the specific section on Behavioral Changes or Caretaker.

Presently, the planned publication schedule where each paper begins with Part I (which will be slightly revised for each section) looks like this:

1. The Main Doctor - A longitudinal case study: an aneurysm from preliminary warnings to recovery.
2. A longitudinal case study: an aneurysm from preliminary warnings to recovery, the role of the caretaker/giver.
3. A longitudinal case study: an aneurysm from preliminary warnings to recovery, aneurysms and associated behavioral changes.
4. A longitudinal case study: an aneurysm from preliminary warnings to recovery, family support and interaction.
5. A longitudinal case study: an aneurysm from preliminary warnings to recovery, the single case methodology and conclusions.
6. A longitudinal case study: an aneurysm from preliminary warnings to recovery, suggested refinements to previous research on aneurysm

The following is a more detailed outline of the report/book:

Part I which is essentially a common introduction for all of the seven main sections:

Introduction

The Research Process used in this case study

Background and Context

Case Studies

Literature Review

Methodology

The sections below this line are confidential and under review at this time

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Family support and interaction

Suggested refinements to previous research on aneurysms

The single case methodology

The role of the caretaker

Associated behavioral changes on the person involved in the case

The main doctor involved

Conclusions

References

INTRODUCTION

On 8 March, 2010, I was out with my wife on a ski tour near our home in Nittedal, Norway. We had just started up the hill near the railroad crossing when we met a longtime friend of the family, Elisabeth Magnussen. Her first remark was to praise Unni for her "recovery" from a brain aneurysm three years early. "Look at you and how far you have come, it is a miracle!" And so I began writing this analysis of Unni's case on Womens Day 2010.

It is the story of a fantastic medical group in the USA, of a dedicated family, but most importantly, the story of a very determined woman who was on the verge of a tragedy that could have radically changed her life and that of her family.

We are interested in "grounding" this work in the research process. There are several reasons for this. The story may help others to understand their situation and make improvements on the process involved. "Others" can include anyone involved in the process ranging from the hospital staff to the family and friends of the patient. In this first part of the report, the background and context will be presented followed by an introduction to empirical case studies.

THE RESEARCH PROCESS

BACKGROUND AND CONTEXT

The author of this family case study has held positions as a Professor in Organization Behaviour, Management Development, and International Management and Business. Presently, I have positions at the Henley Business School in the UK , University of Reading and as an international consultant for Management Data AS in Oslo. I have supervised successfully 50 Doctorate Associates, and 23 of them are now Professors. In the area of health management, 5 theses have been completed, and 3 of these have been rewarded the CBE (Commander of the British Empire) by the Queen of England. I have also acted as a consultant for Ulleval Hospital in Oslo and Buskerud Hospital, with the latter winning the Norwegian Productivity award some years ago.

USING CASE STUDIES IN RESEARCH

Case studies are very popular at the University Masters level, but more difficult to apply at the doctorate level. Bevan (1997) and Homa (1999) studied the Leicester Hospital Change Case in

the UK at the doctorate level. It was the largest funded hospital change case study at that time. Felix (1999) did a doctorate case study on the BBC. Another valuable source for case studies is the Denzin and Lincoln Handbook of Qualitative Research. One of the chapters in an earlier version (1994) by Stake is summarized here. Stake points out that case studies can be quantitative or qualitative or a combination of the two. He concentrated on the qualitative aspects of case studies in the Denzin and Lincoln 1994 Handbook. A qualitative case study can be described as having strong naturalistic, holistic, cultural, and phenomenological interests.
Stake identifies three types of case studies. The first is the intrinsic case study which is undertaken in order to obtain a better understanding of a particular case. The researcher temporarily subordinates other interests so that the case may reveal its story. The main purpose is not theory building, but a type of intrinsic interest. The second type of case study is the instrumental case study where a particular case is examined to provide insights into an issue or refinement of the theory involved. The third type of case study Stake calls a collective case study. In reality, this is an instrumental case study extended to several cases, and the cases may be similar or dissimilar, thus redundancy and variety each have a voice. The cases are often chosen so that one can obtain a better understanding and perhaps develop better theories.

Uniqueness in a case often involves: the nature of the case, the historical setting, the physical setting; other contexts such as economic, political, legal and aesthetic, and the informants through whom the case can be known. Often the researcher gathers data on all of the above. A case is often unique as it is a complex entity operating within a number of contexts. "Issues" are often used to describe the researcher's themes or dimensions. Often the researcher is asking "What issues bring out our initial concerns or dominant themes?"

Telling the Story is an important part of a case study! And the case often tells its own story! The researcher often becomes a teacher using two main pedagogical methods.

Teaching didactically, the researcher is presenting what she or he has learned. In addition, in discovery learning the researcher provides material for students to learn on their own.
Some of the other items that Stake summarizes in his chapter are: triangulation; comparisons, methods of study, cases selection; sampling within the case domain and ethics. Ethics deserve some attention here as the researcher has to make decisions on whose lives and expressions are portrayed, and the risk exposure and possible embarrassment to those involved. Limits of

accessibility should be reviewed, and it is important for targeted persons to receive drafts of how they are perceived, quoted and presented; and the researcher should listen well to the feedback from targeted persons.

In closing his summary, Stake suggests the following stylistic options for case researchers:

How much to make the report a story
How much to compare with other cases
How much to formalize generalizations
How much to include description of the researcher(s) as a participant
How much to anonymize….. or not

Davidson and Costello (1969) make a very strong argument for a single case study (N = 1). Their book attempts to build bridges over the gap between experimental and clinical psychologists, and all the various sections have one thing in common: an interest in applying experimental methods to the study of the individual case. The authors begin with stating that "in spite of some enduring misconceptions, the application of statistical and experimental approaches to the single case is both possible and desirable. This application can require, however, a combination of flexible ingenuity and critical discipline that is not easy to achieve." (p. 1) What follows then, is the case of Peter involving a psychosomatic relationship, retardation, an individual case, and a case study in a behavioral analysis of psychotherapy. Many of the chapters in Davidson and Costello were first published in reputable journals.

The two key references used in both the background literature and in the methodology of this report/section were books written by Atul Gawande (2002, 2007). Close to thirty cases are reviewed in the two books, and the various sections are labelled fallibility, mystery,uncertainty, diligence, doing right. The 2007 book concludes with a section called "Suggestions for becoming a Positive Deviant". Gawande "who manages to capture medicine in all of its complex and chaotic glory, and to put it, still squirming with life, down on the page… With this book Gawande inspires all of us, doctor or not, to be better" (Chen, 2011 in a New York Times review).

Moving on to some recent trends, a televison show on Channel 4 in the UK entitled "Dispatches: Secret NHS Diaries", was shown early in 2011. While the title was somewhat misleading, the programme filmed three people with terminal illinesses and their struggles with

the health–care system. One story involved a case of hidden camera footage for nine days. The patient in question had a seizure on top of his pre-existing Parkinson's disease and kidney disease. The camera footage showed how impatient members of the caring professions can be when things do not run smoothly. The patient had difficulty swallowing his medicine. All the health staff had been informed of this, but some of the nurses took the patients problem as a personal affront. "We cannot help you if you don't help us"….. "Open your mouth!" as the frustration mounted…. "Open your mouth! Do you understand English!" The patients daughter found that the patient could take his medicine if it was given to him in yogurt… but many of the staff persisted in trying to make the patient take the tablets dry.

In Norway, the newspaper Aftenposten ran an article on a Professor who had thirty seven doctors from three different hospitals during a three year illness. One could go on and on with single case examples. Chen (2011) argues that when patients share their stories, health management may improve. Homa, 1999 found that one of the key contributions of his thesis was the need to appoint one main doctor and one main nurse for every patient. Hustvedt (2011) went one step further in her book by suggesting one be an expert with one's own sickness, as did Holte Taylor (2008).

Finally, the intention in this report/section is to integrate some of the previous research work done in the health sector. The strategy will be to present the situation under scrutiny using the notes and interviews taken, and then follow up with comments integrating some of this previous health sector research as an instrumental case study (n = 1).

METHODOLOGY

The main methodology that will be used, the case study, was introduced earlier. Suffice it here to say that the author has been a close observer during the entire case process which now is five years and counting. In quantitative research, the main activities involve finding a group of valid and reliable variables and associated items (questions) that can be used to test some type of model possibly with independent and dependent variables in it. Statistics are then used to test if contributions can be made to the existing research in the area. A case study often involves more descriptive behaviour with fewer subjects in the sample. A better in depth analysis is usually the end result. With the case used in this study, the intention is to include some of the quantitative work that has been done and make appropriate comments.

"Managers Learning in Action" (Coghlan, Dromgoole, Joynt and Sorensen, 2004) takes a wholly original approach to organizational learning. Rather than offering a purely practical or theoretical research, the text is written by a team of managers and academics, combining theory and practice to create a holistic and realistic exploration of learning at work.

Joynt in his chapter on MBRR (Management by Research Results) integrates the concept of action research with action learning using the framework developed by Eden and Huxham (1996). Six Doctor theses cases are then reviewed using this framework. The framework consists of 15 action research characteristics:

1. Action research demands an integral involvement by the researcher in an intent to change the organization. This may or may not succeed, and the change may not be as intended
2. Action research must have some implications beyond those required for action or generation of knowledge in the domain of the project.
3. As well as being usable in everyday life, action research demands valuing theory with theory ELABORATION AND DEVELOPMENT as an explicit concern of the research process.
4. Tools and techniques are not the essence of research, but models and methods are.
5. Action research is concerned with a system of emergent theory, in which the theory develops from a synthesis of what emerges from the use in practice of the body of theory which informed the intervention and research intent.
6. Theory building as a result of Action Research, will be incremental, moving through a cycle of developing theory-to-reflection-to-developing theory from the particular to the general in small steps
7. What is important for action research is not a false dichotomy between prescription and description.
8. For good quality action research, a high degree of systematic method and orderliness is required in reflecting about and holding on to the research data, and the emergent theoretical outcomes of each episode or cycle of involvement in the organization. This involves a report containing: an introduction, context, literature review, analyses, conclusions and contributions.

9. For action research, the processes of exploration of the data – rather than collection of the data – in the detection of emergent theories and development of existing theories, must either be replicable or, at least, capable of being explained to others.
10. Adhering to the nine characteristics above is a necessary but not sufficient condition for the validity of action research.
11. The full process of action research involves a series of interconnected cycles, where writing about research outcomes at the latter stages of an action research project is an important aspect of theory exploration and development.
12. Other methods of research such as controlled experimentation or surveys that can demonstrate the link between data and outcomes more transparently may be better alternatives.
13. Triangulation should be exploited fully and reported.
14. The history and context for the intervention must be taken as critical to the interpretation of the likely range of validity and applicability of the results of action research.
15. Action research requires that the theory developed which is of general value, is disseminated in such a way as to be of interest to an audience wider than those integrally involved with the action and/or with the research.

LITERATURE REVIEW

This part of the report will not dwell on an extensive literature review, however, one document stands out as a framework for the analyses that have been done in this case: "Cognitive Functioning and Health Related Quality of Life after Treatment of Intracranial Aneurysms", a thesis submitted by Haug and accepted by the Faculty of Medicine at the University of Oslo in 2009. More details will come later, but here are some of the main conclusions based on the key finding that cognitive functions improve at different rates:

1. Motor functions improve rapidly the first 6 months.
2. Memory functions first improve between 6 and 12 months.
3. Lower age is an important predictor for improvement in cognitive functions.
4. Many years (usually university level) of education is an important predictor for improvement in cognitive functions.
5. The importance of using more sensitive instruments in cognitive research.

6. All patients had a need for information and closer follow up of the emotional consequences.
7. Only 60% of patients return to work after 12 months postoperation. Most patients have a "good outcome" with only mild to moderate disabilities.
8. Psychologists should be an integrated part of the whole process.
9. Patients with aneurysms do not develop grave cognitive deficits. In addition to the main thesis, four accepted refereed journal articles were also submitted by Haug (2009).

The main contact for this work was Supervisor Professor Wilhelm Sorteberg , who is head of the Department of Neurosurgery at the University of Oslo and also Unni's Norwegian Doctor. A thorough review of the literature will not be done, rather the material will be integrated into the case as we move along. When appropriate, a more thorough literature review will be included in the papers that report on more detailed aspects of the case such as caretaking, hospital administration, and aneurysms.

Evidence based research and practice are very popular themes in European Hospital Management as was illustrated earlier. Hospital management is very complex, and many of the practical applications are in reality more of an art than a science. Things can go wrong, and risks are always part of the complex practical applications.

In the Introduction section, a short summary of the methodologies, literatures, and other information was presented. The reader is now entering the main sections of the research case. As was reviewed, and will be analyzed in more detail , parts of this case involve people and organisations that performed above and below the standard norms. Because of this, the author/researcher must exercise caution on what is printed for public consumption. The rest of the present paper should be considered both CONFIDENTIAL and in a draft stage where the author/researcher is interested in feedback from key actors in the case or key actors because of their expertise. As an update for 2012, this paper has now been cleared by the key actors involved and is ready for publication.

The purpose of the literature review for this case is to highlight some of the earlier aggregate and case findings in the area of aneurysms in order to provide some frameworks for the case reported here. We are also interested in providing a background of some of the key

frameworks the author/researcher has worked with in past research on health administration, or background theories in the area of complex health behaviours. What follows is a short summary of these key sources.

Haug (2009) studied "Cognitive Functioning and Health Related Quality of Life after Treatment of Intracranial Aneurysms". Here is another appropriate summary:

1. The time course of cognitive recovery after aneurysmal SAH is hetrogeneous with motor, psychomotor, visual and verbal, memory alterations, executive functions and intelligence as well as psychomotor functions convalescing within the first 6 months. Verbal memory often does not improve significantly until at least 6 months after the stroke. To conclude, the various cognitive functions have different time courses of recovery with verbal memory requiring the longest time. Unni's recovery tended to modify some of these results.
2. Surgical treatment of unruptured aneurysms (coiling) does not cause new cognitive deficits. This was not applicable in this case as the small aneurysm Unni still has on the left side has not been coiled. Tests over the last 4 years show no changes in size.
3. Often individuals who performed poorly after an SAH were older. This appears to not be the case with Unni who was 67 years old in 2006.
4. Note that Haug reported that the cognitive problems were most likely caused by the bleed itself rather than the treatment of the ruptured aneurysm.

Other additional conclusions gathered from her work with her colleagues were:

1. All patients have a need for information and a closer follow up of the emotional consequences. The main doctor is key here.
2. Most patients have a "good outcome" with only mild to moderate disabilities.
3. Psychologists should be an integrated part of the whole program. This was done in the rehab stay for Unni.
4. Only 60% of patients return to work after 12 months postoperativity. Unni retired just weeks before her sickness. Some six years later she is active on two church boards and is actively doing translation work from Latin and German to Norwegian.

The stories in the Gawande (2002) book are true, but in order to tell them, many of the people involved had to be protected thus names had to be changed. Medicine is a strange business as

the stakes are high and many liberties are taken. People are drugged, manipulated, laid unconscious, and bodies are opened up. The gap between what medicine knows and what we aim for complicates everything we do. Gwande tells stories as a surgical resident, a laboratory scentist, a student of medicine, philosophy and ethics as well as being a family man. These are some of the perspectives the author brings with him in writing the book COMPLICATIONS. The book focuses on three sections: the fallibility of the doctor, the mysteries and unknowns of medicine, and finally centers on uncertainty itself.

Gawande illustrates this with the example of a group of Harvard Business School researchers who had specialized in studying learning curves in industry. They followed eighteen cardiac surgeons and their teams as they took on the new technique of invasive cardiac surgery. They found striking disparties in the speed with which the teams operated and learned. Contrasts between the quickest and slowest teams were startling.

In another story, Faust and Dawes found more than a hundred studies comparing computers or statistical formulas with human judgement. In virtually all the cases, statistical thinking equaled or surpassed human judgement. The author asks the question – "What accounts for the superiority of well-developed computer algorithm? Maybe machines can decide, but we still need doctors to heal!'

One of the most interesting chapters is titled- "When Doctors Make Mistakes" - Mistakes do happen, and they often go unseen. Not always, in one story a general surgeon left a large metal instrument in a patient's abdomen. In another, a cancer surgeon biopsied the wrong part of a woman's breast, and thereby delayed her diagnosis of cancer for months. In a story related to this research case, a man with abdominal pain in the emergency room was not given a CT scan, but was assumed to have a kidney stone. Eighteen hours later, a scan showed a rupturing abdominal aneurysm, and the patient died shortly afterwards.

In a review of more than thirty thousand hospital admissions in New York State, nearly 4% of the hospital patients suffered complications from treatment. It was estimated that, nationwide, upward of forty-four thousand patients die each year as a result of errors in care.

The Gawande book supports the notion that medicine is a strange business, that learning curves are radically different in the same medical areas, and that some type of caretaker or outside observor is often an asset. Gawande (2007) followed up with another book called, "Better", some five years later. "In 2005, the United States spent more than two trillion dollars or one-sixth of all the money we have on health care." (p. 126) One of the key messages in the book is that "Better is Possible!" It does not take a genius, but diligence helps. Gawande's five suggestions at the end of the book are worth repeating for this case:

Ask an unscripted question

Don't complain

Count something

Write something

Change

Taylor (2008) experienced a stroke while working at the Harvard Medical School where she was a brain scientist. Four hours after a major hemorrhage in the left hemisphere of her brain, Taylor could not walk, talk, read, write, or recall any of her life. The book is an integration of academic training and personal experiences and insights and the return to writing a book after the tragedy.

Chapter eight involves Taylor being moved to a Neurological Intensive Care Unit. The author sums up one of her key experiences as "I wish I had a dollar for every time I was given a neurological exam in that first 48 hours".(p 74) What was really happening is "my condition improved rapidly in some areas, but not at all in others". (p 75) It took Taylor eight years to completely heal her mind. Taylor titled the book "My Stroke of Insight".

The following is a revised summary of the abstracts from three doctors I have supervised in the area of health administration: Bevan, Homa, and Playdon.

The Bevan (1997) thesis follows the temporal journey of a hospital's change programme over four years. Bevan was employed by the hospital as Reengineering Programme Leader, and she combines the change practitioner, researcher and theory builder roles to create "actionable knowledge".

The nomothetic change approaches offered by many re-engineering methodologists were insufficient to guide the hospital change process. In addition to situational process re-design, multifaceted changes were observed at leadership, internal community and individual levels. Rather than the anticipated model of change intervention creating desired organisational behaviour, contradictory and shifting factors within the hospital both shaped and were shaped by the progress of the change programme. Paradox emerged as a major theme. The hospital exhibited both an ambition for radical change (creating tomorrow) and a need for significant stability (managing today).

The change programme did not result in the expected patient process configuration. Rather a hybrid speciality process modell emerged. The adaptation of medical micro power was a significant factor. As a result, resources were re-organised around the patient's journey through the hospital. However, patient groups were segmented by the nature of medical input (speciality) rather than by common patient need or flow rate. Whilst contradictions within the hybrid create tensions towards a process form, the strength of speciality and functional perspectives in the wider healthcare system suggest that a further hybrid is more likely than a pure process configuration.

Homa's (1999) study of the National Health Service's (NHS) first complete hospital business process re-engineering programme provides a unique research insight. Further piquancy is added because the researcher is/was also the hospital's chief executive. This opens up a near ethnographic contextual examination of managing in the NHS at a time of tumultuous change. Operationalising the combined roles of chief executive and management researcher is one of this study's three contributions to management research. The research spans the period 1993 – 1996.

Homa describes the hospital's early re-engineering programme results and consequential impact on the hospital's management structure and patient processes are described. The research methodology uses a qualitative and quantitative approach through the medium of four revelatory case studies taken from the Leicester Royal Infirmary's re-engineering programme. The case studies consider radical change attempted in four disparate areas of the hospital. Attention is given to factors that contribute to the assessed motility of change evidenced in each case study. A predictive model is another of the study's major contributions. The variables

that contribute to the constructs of healthcareprocess complexity and healthcare process implementation difficulty are reviewed. The predictive modell provides a nomothetic approach in a highly contextual sensitive manner. Through this analytical prism, emergent management theory is propounded. This is the study's third contribution to research.

The Playdon (2000) thesis used the ideas that the famous educationist A. S. Neill practised at his Summerhill School, providing the modell which was later used to develop an approach to democratic management at the Fairfield Centre, a primary healthcare centre in the socially disadvantaged area of Charlton, in south east London.

The thesis describes the process of developing, implementing, and running this process of democratic management. First, it considers the background for the work – the elusive nature of organisational democracy in today's management, which has made democracy a kind of "holy grail" of management, in contrast to the success of Summerhill's democracy for almost eighty years. Then it examines the nature of the narrative through which the story of Fairfield can be told, and in particular the role of the management consultant as researcher and author.

We will close this extended literature review with Doidge (2007). His conclusion was that the brain is more like an animated sea creature constantly changing and able to respond to injury with both functional reorganization as well as thinking into new anatomic configurations. Doidge calls his experimental data relatively primitive and calls for more research to be done in this area.

DOCTOR BASKAYA, THE MAIN DOCTOR INVOLVED IN THE CASE

"Alle har krav på en fastlege (everybody has the right to an assigned doctor)" was the headline on page 6 of the 4th of February, 2011 issue of the Oslo newspaper Aftenposten. The article goes on to report that a Professor in Medicine during his hospitalization experienced 37 different Doctors in three hospitals. No one person really knows your situation. What may be needed is the Homa (1999) approach of having one main doctor when hospitalized.

Unni was lucky that Doctor Baskaya was on hand to help her after the helicopter from Richland Center Wisconsin had landed at University Hospital in Madison. I, husband Pat, had ordered the ambulence from our cottage some 10 miles south of the local hospital in Richland Center,

which is about 55 miles from Madison. There was no room for me in the helicopter, so I drove home to get my bag and then continued on to Madison. When I arrived in the Intensive Care Department, Unni was sleeping and I had the priviledge of meeting Professor Baskaya. He explained that they had drained the blood from an aneurysm on the right side of her skull. She was resting as we went out to the hallway to discuss the next steps. Doctor Baskaya informed me there were three alternatives: coiling, do nothing, and operate by opening her skull. I informed him that I was also a professor and had supervised close to 50 associates to their doctor degree in management and business. It was contrary to my value system and experience with other doctor students to assume that I could make a WISE decision. I told the Doctor that I would respect and value his decision in the matter for the rest of my life. He put his hand on my shoulder and said "Thank you", but he needed an hour or so to make the decision. He came back in an hour after consulting with two of his colleagues and told me that the alternative they would recommend was to operate.

I expected them to operate that night, but he explained that his best team would be coming in the morning. Again with his hand on my shoulder, he asked that we be quiet about the delay. The next day, Unni spent over 7 hours on the operating bed. Doctor Baskaya came in to see me and reported that he felt all had gone rather well. He felt that he had NOT damaged anything and that, hopefully, things would be OK. Below is a summary note written in November 2006:

"I had the pleasure of seeing Ms Unni Joynt in my clinic at the University of Wisconsin Hospital. As you know, she is a 67-year-old female who was visiting here from Norway. Over the last several weeks, she has complained of a slight headache. On the morning of October 2, she had a severe headache, which was the worse headache of her life. She was taken to the Richland Medical Center Hospital, and she continued to deteriorate. She had to be intubated and medflighted to the University of Wisconsin Hospital for further evaluation and management. She was admitted to our Neurosurgery Intensive Care Unit on October 2. We placed a ventriculostomy to drain the CSF. Her angiography showed anerior communication artery aneurysm filling from the right dominant A1. Her initial Hunt and Hess grade was 4 after ventriculostomy, although she showed slight neurologic improvement. She was not following commands. She was briskly localizing pain.

We had a long discussion regarding this complex anterior communicating aretery aneurysm. Angiography confirmation was that this aneurysm had 3 lobules and the endo-vascular colleagues felt that this is a better candidate for surgical clipping. The patient underwent the orbital zygomatic craniotomy and successful clipping of this ruptured complex anterior communicating artery aneurysm. On postoperative course, she continued to improve neurologically. A few days after surgery, she started following commands, and she eventually was extubated and tolerating the extubation completely, and she had to have the left endoscopic ventriculoperationeal shunt placement (operation 2). She also tolerated the procedure well, and she improved quickly. She was transferred to a regular room. During the ICU stay, she also developed bilateral lower extremity DVTs for which she had to have the inferior vena cardiovascular filter (operation 3).

She was transferred to our Rehabilitation Center where she continued to recover well, and she was able to start speaking and moving without assistance. She was discharged home last week, and she is here for a followup visit. She is awake, alert, responding verbally and meaningful. Her Extraccular movements are full. She has no facial asymmetry. She has a minimal amount of anophthalmos and the temporal indentation from the cranictomy. Her motor strength is 5/5. She can stand and walk without assistance. However, long distances are difficult for her. Her short-term memory is also getting better according to her husband. Her wounds are healed very well. Sutures were removed. Her current medicationsare Amanmtadine, Keppra and Multivitamin.

I instructed them to stop the Keppra once they arrive in Norway. Also, she complained of her right lower extremity pain and the swelling, which came down in the last 2 days. That concerns me regarding the DVT. We will get a lower extremity Dopplar to rule out DVT. If that is okay, to me from a neurological standpoint, she can fly back to Norway. At that same time, she also was noted to have a 2nd aneurysm on the left side and the right internal carotid arterly bifurcation, which is measuring 2mm in size. I had a long discussion regarding the natural history of this aneurysm, and I quoted a 0.5% annual hemorrhage rate from this aneurysm since it is associated with previous ruptured anterior communicating artery aneurysm. I also recommend the intervention for this, either surgery or endovascular coiling. However, I also suggested to them to wait until she is fully recovered from this subarachnoid hemorrhage and

the surgery. They understood that, and they will call us back when they arrive in Norway. We will keep in touch……"

Doctor Baskaya had the habit of visiting us at Unni's hospital bed early in the morning while making his rounds and late in the evening. The nurses reported to us that he was the BEST, and that we were lucky to have him. His service and openness was fantastic, and he arranged for the two subsequent operations while Unni was in intensive care.

He also delayed Unni's return to Norway as he was not sure she was ready to travel when the Danish Doctor, representing SAS airlines, had wanted her to fly home. SAS was great, and they were willing to fly a plane into Madison Airport to fly her home to Oslo. But Madison did not operate an international airport so we eventually left from Chicago with a nurse escort sent from Norway. The insurance company, Europeiske Reiseforsikring, and Scandinavian Airlines provided outstanding service. Unni was discharged from the University of Wisconsin Hospital and Clinics for the last time on 22 November 2006 having been admitted on 2 October, 2006. Her discharge diagnosis shows.

Bilateral lower extremity deep venous thrombosis

Inferior vena cava filter placed October 13, 2006

History of subarachnoid hemorrhage, October 2, 2006

Obstructive sleep apnea

A year later we returned to Madison and visited Doctor Baskaya. When he saw Unni in the hallway outside his office, his words were… "Here comes my miracle." One could write a book about Professor Doctor Mastafa Baskaya, but we would like to close with a Norwegian incident that occured a year later. I, Pat, was on my way to Oslo to pick up a grandchild. When I got on the train in Lillestrom, I was the only person in our wagon other than the conductor who tried making conversation by asking: "Your accent is not Norwegian, where are you from?" I replied America and then asked him where he was from. He replied that he was from Turkey. I remarked that a Turkish doctor had saved my wife's life a couple of years ago. He asked what the doctor's name was, and I replied with a questioning reaction: "Baskaya". The conductor then replied: "Why, he is a famous neurosurgeon". I was stunned and asked: "How did you know he was a neurosurgeon?" He replied that his uncle was well known in Turkey as a famous heart specialist, and that the other famous doctor from Turkey often appearing on Turkish TV was Mustafa Baskaya. I called Unni to tell her the story… What a small world!

The main doctor during the three operations and their aftermath from 2006 was Doctor Baskaya. Since then Unni has had annual controls in Norway. Her main specialist in Norway has been seksjonsoverlege dr. Med. Wilhelm Sorteberg. In addition to checking on the situation involving the three operations Unni had in 2006, he mainly reviews a 2 mm aneurysm on the left side of her head in the same location as the one on the right side.

The annual check for 2012 was scheduled for the middle of April and Doctor Sorteberg was in the USA, so his wife Angelica, also a neurologist took over. She reported that there was no change in the size of the aneurysm on the left side. Dr. Angelica Sorteberg also suggested that we change the annual check up from one to two years. The main reason for this is the radiological test which requires a contrast fluid injection before the pictures are taken of Unni's skull. The contrast fluid can affect one's kidneys, so Dr. Sorteberg suggested every other year to reduce this risk. From childhood, Unni has had one normal and one small kidney and both function well. We also discussed Unni's sleeping problems. She is usually awake around every two hours sometimes for a bathroom call. Often in the middle of the night she has difficulty going back to sleep. This results in a tiredness/exhaustion early in the day, so a noon nap is needed. She usually falls asleep during these resting periods. Unni has always had sleeping problems, but they definitely increased after 2006. In the Madison Hospital, she received an apnea diagnosis, and in Norway she has discussed this with her general physician, Dr Age Slyngstadli. If one uses the A and B categories, Unni is usually at her best around dinner.

PRACTICAL AND THEORETICAL CONTRIBUTIONS FOR THIS SECTION

1. The main doctor hypothesis in the empirical (Homa, 1999) and the practical (Gawande 2002, 2007; Gupta 2012) literature was supported with Doctor Baskayas behaviour of making key decisions on:
    a. Unni's three operations followed by daily contact.
    b. the rehabilitation process with an interest in the progress and giving positive and negative feedback when necessary.
    c. the flight trip to Norway where he advised that Unni NOT travel after a Danish SAS doctor had given the airlines and the insurance company the message "Bring her home to Norway."
    d. follow-ups, after six years we still have active contact with Doctor Baskaya

2. Family support. Doctor Baskaya wrote a letter to the insurance company stating that family support was essential. The company paid for the flights of daughters Maria and Kari from Norway to the USA.
3. "No man is an island." The hospital with many employees asking us each day "How can we do things better?" was a valuable asset. There was a "culture" of striving to be best and trying to improve on a daily basis.
4. As I close this section early in 2012, I read from the internet that CNN's Sanjay Gupa (2012) has written his first novel "Monday Mornings". The Monday morning meeting with a group of doctors at the hospital Gupa works at, is called "Morbidity and Mortality". They discuss the mistakes they have made, and Gupa describes it as a "peek behind the curtain".

REFERENCES

Aftenposten Newspaper, (20ll), articles: Sykehus er lik en produksjonsbedrift, Alle har krav på en fastlege, Skal slippe mange lege.

Bevan, H. (1997), Managing Today While Creating Tomorrow: Actionable Knowledge for Organisational Change in an NHS Hospital, Doctor Thesis from Brunel University, UK.

Bolte Taylor, J. (2008), My Stroke of Insight; a Brain Scientist's Personal Journey, Hodder Publishing, London.

Channel 4, UK, (2011), Dispatches: Secret National Health Service Diaries.

Chen, Pauline, (Feb. 10, 2011) , When Patients Share their Stories Health May Improve, New York Times.

Davidson, P.O. and Costello, C.G. (1969), N=1: Experimental Studies of Single Cases, Van Nostrand Reinhold Company, London.

Denzin, N.K. and Lincoln, Y.S. editors, (latest edition), Handbook of Qualitative Research, London, Sage Publishing.

Doidge, N. (2007), The Brain that Changes Itself; Stories of Personal Triumph From the Frontiers of Brain Sceince, Viking Press.

Gawande, A. (2002), Complications, A Surgeon's Notes on an Imperfect Science, Henry Holt and Company, New York.

Gawande, A. (2007), Better, A Surgeon's Notes on Performance, Picardo, New York

Gupta, S. (2012), Monday Mornings, Grand Central, New York.

Haug, T. K. (2009), Cognitive Functioning and Health Related Quality of Life after Treatment of Intracranial Aneurysms, University of Oslo Ph.D. Thesis.

Homa, P. (1999), Re-engineering The Leicester Royal infirmary Healthcare Process, Doctor Thesis from Brunel University, UK.

Hustvedt, S. (2011), Den Skjelvende Kvinnen, Aschehoug, Oslo.

Joynt, P. et al. (editors Coghlan, Dromgoole, Joynt and Sorensen) , (2004), Managers Learning in Action, Thomson Publishing, London.

Joynt, P. I wish to thank the 50 doctor associates, now Doctors and Professors, who studied with me as their supervisor, for all the insights and learning they have given me.

Kingsley, J. (2011), How we Treat the Sick: neglect and abuse in our health services, Tablet Bookshop

Kubler-Ross, E. (2005) On Grief and Grieving: Finding the Meaning of Grief through the Five Stages of Loss, Simon and Schuster Ltd, New York

Mulligan, C., (February 27, 2010), It feels like a life sentence", The Tablet

Playdon, Zoe Jane, (2000), The Fairfield Centre: A Case Study in Democratic Management, Doctor Thesis from Brunel University, UK.

VanMaanen, J. (1988),Tales of the Field; On Writing Ethnography, University of Chicago Press, Chicago.

Was the Grass Trampled When the Two Elephants Fought? Measuring Societal Cultures: Project GLOBE vs. Hofstede

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Abstract

In quantitative-based research within the field of societal cultural studies, two of the foremost research teams, namely Hofstede (2001) and House et al. (2004), have held the limelight during the last half decade. During this period, numerous research journals have published critiques of these two approaches to quantifying cultural dimensions. These are critiques written either both 'camps' in a written battle, or are reviews written by other scholars who show a preference for either Hofstede or Project GLOBE's research. The title of this article refers to Smith's seminal paper (Smith, 2006) and, to an African proverb that states that when two elephants (two great forces) meet, the grass (the research environment) can be damaged. Hence, this article has two aims: Firstly, to offer a brief literature review of the research environment of cross-cultural studies. Secondly, to review this 'battlefield'.

Key words: cross-cultural studies, quantitative research, Hofstede, Project GLOBE.

Introduction

The exchange of opinions in academic journals about Hofstede (2001) and Project GLOBE (House et al., 2004) marks a new era in the development of cross-cultural research. In this paper, I firstly offer a literature review, within a historical perspective, of major cross-cultural studies carried out during the last five decades in order to map the research field. Secondly, I review the main critiques of both Hofstede's pioneering work and Project GLOBE's milestone cultural study (House et al., 2004) in order to consider to what degree the current debate has damaged or fortified this research field.

Predominant cross-cultural studies

Without the pioneering work within cultural studies of the following key scholars, and the subsequent discussions related to their empirical findings, there would have been little scholarly data to either critique or follow. Figure 1 below presents an overview of some predominant cross-cultural studies during the last 50 years, to set the scene for the debate between Hofstede and Project GLOBE's research.

Figure 1. Predominant cross cultural studies

Predominant cross-cultural frameworks 1952-2007

Researchers:	Predominant constructs	Major findings	Level of analysis	Key informants	Measurements
Parsons & Shils (1951)	Foundation laid for a socia-psychological theory of human behaviour	Culture is 'ways of orienting and acting' and 'embedded in meaningful symbols' and 'patterns of value orientation'	Qualitative: Individual and group	9 of America's foremost cultural scholars represented qualitative research papers	NA Ethnographic qualitative data
Kluckhohn & Strodtbeck (1961)	Culture is society's / individual's solution to common human problems, our value orientation	5 value orientations: 1. Time orientation 2. Relationship to nature 3.Basic human nature 4.Activity orientation 5. Relationship to people	Qualitative and quantitative: Individual	US participants	Quantitative survey: hypothetical questions with 3 alternative answers which revealed value orientation 5 value dimensions
Hall (1959)	Patterns of communication	1. High vs. Low context 2. Proxemics 3. Polychronic vs. Monochonic	Qualitative: Individual and group	NA Ethnographic study of cultures	1. High vs. Low context 2. Proxemics 3. Polychronic vs. Monochonic
Haire et al. (1966)	Cross-cultural leadership theory: first important study	Two poles: autocratic, directive styles of leadership vs. democratic, participatory	Qualitative and quantitative: Individual and group	3.600 managers in 14 countries	Construct: attitudes related to autocratic - directive to democratic-participatory showed 4 country clusters

Predominant cross cultural frameworks 1951-2008 (cont.)

Researchers	Predominant constructs	Major findings	Level of analysis	Key informants	Measurements
Rokeach (1968)	Culture is people's responses to two fundamental questions: 1. What do they want to pursue in life 2. How do they pursue these goals	36 individual values. Two poles: freedom vs. equality	Qualitative and Quantitative: Individual and group	US participants	Quantitative survey: Rokeach value survey (RVS): 2 x 18 values to define 2 value dimensions
Hofstede (1967/1980)	National culture is a component of our mental programming People carry mental programmes that are developed in the family in early childhood and re-inforced in schools and organizations	1. Individualism vs. collectivism 2. Power distance 3. Uncertainty avoidance 4. Masculinity vs. Femininity 5. Confusion dynamism 6. Indulgence vs. Restraint 7. Monumentalism vs. Self-effacement	Quantitative: group	88,000 IBM managers from 72 societies	Quantitative survey, 34 items
Geertz (1973)	Culture as a historically transmitted pattern of meanings embodied in symbols	Thick description theory	Qualitative: Individual and group	NA: Ethnographical research (Mostly South East Asia and North Africa)	NA Ethnographic research: field data
Denison (1984)	Related to 1) the level of participation in decision making, 2) consistency of values, 3) ability to adapt, 4) the existance of shared view of a company's mission	Empirical data to prove the existence of 4 key organizational cultural dimensions	Quantitative: group	43,747.00 work groups in 34 US firms, 25 different industries	4 dimensions of organizational culture: 1. Involvement 2. Consistency 3. Adaptability 4. Mission

Researchers	Predominant constructs	Major findings	Level of analysis	Key informants	Measurements
Kogut and Singh (1988)	Cultural distance: based on equating Hofstede's country scores	Effective Composite index: (to avoid common method variance)	Quantitative: group	As Hofstede, above	CD*j* = ∑ *[(I ij – I iN)2 / V i] /4*, i=1 Kogut and Singh's formula (Evans, 2007)
Schwartz (1992)	45 individual values And 7 cultural level dimensions: 1. Conservatism 2. intellectual autonomy 3. Affective autonomy 4. Egalitarian commitment 5. Mastery 6. Hierarchy 7. Harmony	Application of the Schwartz Value Survey: to study values rather than behaviour	Qualitative and quantitative: individual and group	35,000 teachers and students from 67 countries	Schwartz Value Survey: 7 cultural level dimensions: 1.Conservatism 2. Intellectual autonomy 3.Affective autonomy 4.Egalitarian commitment 5.Mastery 6.Hierarchy 7.Harmony
Schein (1992)	Cultures differentiated in 3 levels	3 levels of culture: Visible (superficial) Vales and beliefs Core assumptions (deepest level)	Qualitative: organisational	NA Study applying secondary literature and theoretical observation	Deeper cultural dimensions impact external adaptation issues and internal integration issues
Trompenaars (1996)	Culture is the way people solve problems related to 3 issues: 3. Ralationships 2. Time 3. Environment	7 cultural dimensions	Qualitative and quantitaive : group	46,000 managers from different countries and companies	Quantitative scales : 1.Universalism vs. Particularism 2.Individualism vs. Communitarianism 3.Neutral /Emotioanal 4.Inner-directed vs. Outer-directed 5.Specific vs. Diffuse 6.Achieved /Ascriptive based status 7.Attitudes to time

Researchers:	Predominant constructs	Major findings	Level of analysis	Key informants	Measurements
Harich & LaBahn (1997)	Cultural sensitivity: a customer's perception that the salesperson accommodates the customer's buying needs	3 dimensions of cultural sensitivty: 1. To establish friendship 2. To understand and appreciate culture 3. To show flexibility	Qalitative: individual Quantitative: firm	52 US and Mexican manufacturers, senior sales, marketing and distribution executives	One-dimesnional construct consisting of 4 items: International experience; country experienec; open-mindedness; adaptive business style
Inglehart et al. (2004)	Cultural change and its consequences: strong links between values and beliefs of mass publics and democracy	Two cultural dimensions dominate the global picture: 1) Traditional – secular-rational vales 2) Survival-self expression values	Qualitative and quantitative: group	85% of world's population in over 80 countries	World Values Survey designed to provide a comprehensive measurement of all areas of human concern from religion to politics, to economic and social life.
GLOBE project (House et al., 2004)	1) Assertiveness orientation 2) Gender egalitarianism 3) Institutional collectivism 4) Family collectivism 5) Power distance 6) Uncertainty avoidance 7) Future orientation 8) Performance orientation 9) Humane orientation	Global Leadership and Organisational Behavioural Effectiveness measures to compare societal and organisational cultures in 62 countries	Quantitative: group	17,370 respondents worldwide from 3 industries: telecommunications, finance and food processing in 62 societies	9 constructs measured in 2x2 ways: as prctices 'as is' and espoused values 'should be': Measurements taken 'within societies' and 'within organisations'

Parsons and Shils' work sought to lay a foundation for a socio-psychological theory of human behaviour. Patterns of value orientation were singled out as the most crucial cultural elements in the organization of systems of action. Culture was distinguished from other elements of action by the fact that it is intrinsically transmissible from one action system to another, from personality to personality by learning and from social system to social system by diffusion. This is because culture is constituted by 'ways of orienting and acting', these ways being 'embodied in meaningful symbols' (Parsons and Shils, 1952; Cardon, 2008).

Kluckhohn and Strodtbeck define five common human problems for which nations collectively seek solutions. These value orientations are 'constructs' that are commonly shared within any community and therefore resemble a pattern of expected/agreed behaviour. Kluckhohn and Strodtbeck suggest the following five basic types of problems to be solved by every society:

1) On what aspect of time should we primarily focus – past, present, or future?
2) What is the relationship between humanity and its natural environment – mastery, harmony, or submission?
3) How should individuals relate with others – hierarchically (lineal), as equals (collateral), or according to their individual merits?
4) What is the prime motivation for behaviour – to express oneself (being), to grow (being-in-becoming), or to achieve (doing)?
5) What is the human nature – good, bad (or evil), or a mixture?

Hall is most associated with qualitative research into cultures in terms of 1) high-context versus low-context communication patterns, 2) the theory of proxemics, and also 3) cultural values in terms of monochromic versus polychromic approaches to tasks (Hall, 1976). Hall claims that in a high-context culture most of the information to be communicated is either in the physical context or internalized in the person, while very little is in the coded, explicit, transmitted part of the message (Brown and Levinson, 1987:3). Hall's seminal work continues to command interest both in undergraduate university study programmes and as a foundation for present cultural studies (Hofstede, 1980; Trompenaars and Hampden-Turner, 1993; Gesteland, 2008; Cardon, 2008).

Haire et al. specifically studied leadership, the role of the manager in his culture and motivation satisfaction among 3,600 managers. The focus of their work in 'In Managerial Thinking' was to adopt a behavioural approach in order to examine the values and attitudes that actually guide managerial actions and practices. Haire et al. focused on management attitudes in 14 countries: n attitudes related to autocratic – directive or democratic – participatory values.

Rokeach claimed that for most people life is not an aimless, mindless drift; their actions and activities are conscious or unconscious manifestations of their responses to two fundamental questions: 1) What do they want to pursue in life? and 2) How do they pursue these goals? He defines this dilemma as the choice we have between freedom and equality. In a survey presented in 1967, he suggested that 36 values are widely and perhaps universally held by human beings, and that they lead to the choice a society makes concerning whether to value freedom or equality (Rokeach, 1968). Values, according to Rokeach, are historically related, and deal with what is required or forbidden, what is judged to be good or bad, right or wrong. Thus in any given cultural group, values represent standards by which behaviour is evaluated and hence lead to the choice we make concerning whether to value freedom or equality in our specific society.

Hofstede: Perhaps the most influential classifications of cultural dimensions are those of Geert Hofstede. Over two decades have passed since the publication of *Culture's Consequences: International differences in work related values* (Hofstede, 1980), inspiring thousands of empirical studies (Kirkman et al., 2006). At first, four and later five main dimensions on which country cultures differ were revealed through theoretical reasoning and statistical analysis: Individualism-Collectivism, Power Distance, Uncertainty Avoidance, Masculinity vs. Femininity, and Long-Term Orientation vs. Short-Term Orientation. Similar to Kluckhohn and Strodtbeck's theories, Hofstede's claim is that these five dimensions of culture reflect basic problems that any society must cope with, but for which the solutions differ. In January 2008, a new survey instrument, the Values Survey Module 08, was introduced by Hofstede in collaboration with Geert Jan Hofstede, Michael Minkov, and Henk Vinken. This instrument will measure the original five dimensions plus an additional two: Indulgence vs. Constraint and Monumentalism vs. Self-Effacement.

Individualism-Collectivism: Where individualism is defined as 'a loosely knit social framework in which people are supposed to take care of themselves and of their immediate families only', and collectivism 'is characterized by a tight social framework in which people distinguish between in-groups and out-groups, they expect their in-group to look after them, and in exchange for that they feel they owe absolute loyalty to it' (Hofstede, 1980, 45). *Power Distance* is defined as 'the extent to which a society accepts the fact that power in institutions and organizations is distributed unequally' (Hofstede, 1980, 45). *Uncertainty Avoidance* is defined as 'the extent to which a society feels threatened by uncertain and ambiguous situations and tries to avoid these situations by providing greater career stability, establishing more formal rules, not tolerating deviant ideas and behaviours' (Hofstede, 1980, 45). *Masculinity-Femininity*: Masculinity is defined as 'the extent to which the dominant values in society are "masculine" that is, assertiveness, the acquisition of money and things, and not caring for others, the quality of life, or people' (Hofstede, 1980, 46). *Long-term Orientation* refers to future-oriented values such as persistence and thrift, whereas short-term orientation refers to past- and present-oriented values such as respect for tradition and fulfilling social obligation (Kirkman et al., 2006, 286). *Indulgence vs. Restraint:* The indulgence dimension stands for a society which allows relatively free gratification of some desires and feelings, especially those that have to do with leisure, merrymaking with friends, spending, consumption, and sex. Its opposite pole, Restraint, stands for a society which controls such gratification, and where people feel less able to enjoy their lives. *Monumentalism vs. Self-Effacement:* Monumentalism stands for a society which rewards people who are, metaphorically speaking, like monuments: proud and unchangeable. Its opposite pole stands for a society which rewards humility and flexibility.

Geertz has conducted extensive ethnographical research in South East Asia and North Africa. He proposed that culture is both a model of and a model for experience and this theme is a key point in many of his research papers (Ellison, 1975:637). As an anthropologist, he drew upon his own intensive fieldwork for empirical data. His work deals with topics such as religion, ideology, political order, and cultural analysis. In his ethnographic research he argues against locating culture 'in the minds and hearts of men' (Geertz, 1973:11). Geertz is perhaps best known for his application of the term 'thick description theory', where he states 'cultural analysis is (or should be) guessing at meanings, assessing the guesses, and drawing explanatory conclusions from the better guesses' (Ellison, 1975).

Denison assesses organizational culture among 6,671 work groups, in 34 US firms, from 25 industries. The study identified four dimensions of organizational culture: 1) *Involvement*: the level of participation by an organization's members in decision making), 2) *Consistency*: the extent to which beliefs, values, and expectations are held consensually by members, 3) *Adaptability*: the degree to which an organization has the ability to alter behaviour, structures, and systems to cope with environment change, and 4) *Mission*: the existence of a shared view of the organization's purpose (Holt, 2007).

Kogut and Singh developed a composite index of cultural distance based on Hofstede's country scores. Thus their work can also be defined as having a quantitative-based approach. The deviations along Hofstede's first four dimensions – Power Distance, Uncertainty Avoidance, Individualism vs. Collectivism and Masculinity versus Femininity – are calculated. The index is represented algebraically as:

Figure 2. Kogut and Singh's formula (Evans, 2007)

$$CD_j = \sum_{i=1}^{4} [(I_{ij} - I_{iN})^2 / V_i] / 4,$$

Thus 'CD*j*' above is the cultural difference of the country being studied compared to the US culture. Many studies have used the Kogut and Singh (1988) formula or an adapted version to test for the effect of, for example, cultural distance on an MNE's establishment mode choice (Agarwal, 1994; Barkema et al., 1996).

Schwartz has developed seven culture-level dimensions which he labeled 1) *Conservatism* **–** which represents a culture's emphasis on maintaining status quo and propriety; 2) *Intellectual Autonomy* **–** which refers to the extent to which people are free to independently pursue their own ideas and intellectual directions; 3) *Affective Autonomy* – referring to the extent to which people are free to pursue their affective desires; 4) *Egalitarian Commitment* – which refers to the extent to which people are inclined to voluntarily put aside selfish interests to promote the welfare of others; 5) *Mastery* – expressing the importance of getting ahead by being self-assertive; 6) *Hierarchy* **–** which denotes the extent to which it is legitimate to distribute power

and resources unequally; and 7) *Harmony* – which denotes the importance of fitting in harmoniously into the environment (Schwartz, 1994:112–115). Some texts may refer to three higher order continua: independence, openness to change, and self-enhancement, along with the following sub-dimensions: power, achievement, hedonism, stimulation, self direction, universalism, benevolence, tradition, conformity, and security.

Schein specifically studies organizational culture rather than cross-national culture. Nevertheless, his theories are also applied in cross-cultural studies. He argues in his third edition of *Organizational Culture and Leadership* (2006) that culture is pervasive and ultimately embraces everything that a group in concerned about and must deal with (Schein, 2006:2). He stresses that besides corporate culture, subcultures must also be considered, and thus he differentiates culture in three levels. The term 'level' refers to the degree to which a cultural phenomenon is visible to the observer: 1) The deepest level includes the basic assumptions, unconscious, taken-for-granted beliefs which he defines as the essence of culture; 2) The middle level is characterized by the norms, values, and rules of behaviour that members of a culture use to distinguish members of a different culture 'espoused values'; and 3) The top level includes the artifacts, the visible organizational structures and processes that are superficial – what people can see, hear, and feel when one person encounters an unfamiliar culture (Schien, 2004).

Trompenaars, together with co-researcher Hampden-Turner, draws upon the work by Parsons and Shils (1952), Kluckhohn and Strodtbeck (1961), and Hall (1976), and defines the concept of culture as the way people solve problems, particularly related to relationships, time, and the external environment (Trompenaars, 1996). He suggests the following scales on which individual responses to problems are interpreted: *Universalism vs. Particularism*: Are rules universal in a society, or specific in terms of who you are? *Individualism vs. Collectivism*: Is your identity part of a group, or are your individual identity and success paramount? *Neutral vs. Emotional*: To what extent do you show feelings? *Inner-directed vs. outer-directed*: To what extent do you hope to dominate or live in harmony with your environment? *Specific vs. Diffuse*: Is your business relationship restricted to a specific contract, or does the friendship permeate your life? *Achievement-status vs. Ascriptive-based status*: Are you respected for your track record, or is status ascribed to you according to your gender, position, and family? *Attitudes to time, linear vs. Cyclical*: When time is perceived as a linear function vs. as a repetitive cycle.

Harich and LaBahn study cross-cultural performance within the fields of sales and marketing. In their seminal article 'Enhancing International Business Relationships: How Mexican distributors rate US Manufacturers' they state that for many manufacturers success in the international marketplace depends largely on how well they manage their relationships with retailers, distributors, and agents in foreign cultures. Trust, dependence, idiosyncratic investments, continuity, and cultural sensitivity are seen as key determinants to a successful cross-national business relationship (Gooderham et al., 2003:287).

Inglehart et al.'s (2004) ongoing research, the World Values Survey, focuses on cultural change and its consequences. These data show that there are strong links between the values and beliefs of mass publics and the presence or absence of democratic institutions, thus supporting the thesis that political culture plays a crucial role in the emergence and survival of democracy. Inglehart et al. propose that two cultural dimensions dominate the global picture: 1) *Traditional/Secular-rational (y axis)* and 2) *Survival/Self-expression values (x axis).* These two dimensions explain more than 70% of the national variance in a factor analysis of ten indicators. The Traditional/Secular-rational values dimension reflects the contrast between societies in which religion is very important and those where it is not. The values of Survival vs. Self-expression are linked to a society's transition from being industrial to being post-industrial, as unprecedented wealth accumulation in many industrialized nations means that survival is now taken for granted. Thus a central component of this emerging dimension involves the polarization between materialist and post-materialist values. Self-expression values, on the other hand, give high priority to environment protection, tolerance of diversity, and rising demands for participation in political and economic decision making.

Project GLOBE: A total of 170 social scientists and management scholars from 62 cultures representing all major regions of the world are engaged in this long-term programmatic series of inter-cultural studies. Data on both societal practices and societal values have been collected from over 17,300 respondents. *Power Distance* is defined as the degree to which members of an organization or society expect and agree that power should be stratified and concentrated at higher levels of an organization or government (House et al., 2004:12). Project GLOBE presents *Performance Orientation* as the degree to which a society encourages and rewards group members for performance improvement and excellence (House et al., 2004:12). High-

scoring cultures tend to focus on achievement, the future, taking initiative, and job-related accomplishments. Low-scoring countries, on the other hand, tend to focus on tradition, family, affiliation, and social ties. Hence, social relationships are valued more than achieving is. *Future Orientation* is the degree to which individuals in organizations or societies engage in future-oriented behaviors such as planning, investing in the future, and delaying individual or collective gratification (House et al., 2004:12). *Gender Egalitarianism:* One of the most fundamental ways in which societies differ is the extent to which each prescribes and proscribes different roles for women and men (Hofstede, 1980:11). Some societies are more Gender Egalitarian and seek to minimize gender role differences (House et al., 1999). This research focuses on the degree to which women and men are represented in the workforce, hold positions of authority, and participate in child rearing and housework. *Assertiveness*: Kluckhohn and Strodtbeck (1961) discussed dominance as an element of assertiveness in relation to the nature of the relationship of individuals, groups, and societies with the outside world. Assertive societies will thus view relations in terms of dominance (House et al., 2004:12). *Individualism and Collectivism*: *Institutional Collectivism* takes the form of laws, social programs, or institutional practices that encourage collective behavior (House and Javidan, 2004). *In-group Collectivism* measures the degree to which members would prefer making decisions at the group level rather than at the individual level (Schneider and Barsoux, 2002). Further, In-Group Collectivist societies will submit to the will of the group in determining beliefs and behaviors (Adler, 2008). *Humane Orientation*: This is a dimension that, although unique to Project GLOBE's model of cross-cultural research, is grounded in the theory of Kluckhohn and Strodtbeck's (1961) Basic Human Nature and McClelland's (1985) concept of the affiliative motive (House and Javidan, 2004). Project GLOBE claims that there is a correlation between decreasing unhelpfulness and urbanization with increasing population density (House et al., 2004:563).Values such as altruism, benevolence, kindness, love, and generosity are salient motivating factors guiding people's behavior in societies characterized by a strong Humane Orientation. *Uncertainty Avoidance* is the extent to which members of an organization or society strive to avoid uncertainty by relying on established social norms, rituals, and bureaucratic practices. Hence, people in high uncertainty avoidance cultures actively seek to decrease the probability of unpredictable future events that could adversely affect the operation of an organization or society and to remedy the success of such adverse effects (House et al., 2004:13).

Possible limitations of Project GLOBE include the constraints it imposes upon any future research project in terms of time resources. Asking participants to answer a 116-item questionnaire may make getting a valid and sufficient response rate difficult. A more in-depth critique of Project GLOBE and of Hofstede's work will now be presented.

The current debate: a summary of the critique of the Project GLOBE study

Table 1 below offers a review of the critique of the Project GLOBE study and clarifies the corresponding response or discussions by the Project GLOBE team.

Table 1. Summary of the critique of Project GLOBE

Summary critique of Project GLOBE by:	**The critique**	**Response / related discussions by Project GLOBE**
Minkov and Blagoev (2011)	Globe has added only one validated new dimension: assertiveness norms. The remaining GLOBE dimensions are of a dubious nature. Their meaningfulness is unclear	The process through which the GLOBE questionnaire was developed has been clearly articulated and demonstrates a collaborative and internationally inclusive exercise in cross-cultural research. GLOBE comprises over 160 scholars from 64 societies. 145 of these are country co-investigators who have been directly involved in creating and facilitating the project. They commented on relevance, understandability, translatability and face validity of the items as they pertain to their societies (Javidan et al., 2006)
McCrae (2008)	The 'as is' practices variants are closer to stereotypes than objective reality	As above.
Hofstede (2006)	The GLOBE values measures have no necessary logical linkage with the prior measures of values used by for instance Schwartz (1994) or Inglehart et al. (2004).	Scales showed convergent and discriminant validity with respect to unobtrusive measures, archival data and other national surveys such as the world survey (Inglehart et al., 1998). All of this evidence attests to the construct validity of the scales (Gupta, Sully de Luque, and House, 2004).
Smith (2006)	The complexity demanded of analyses built upon nine dimensions (with 116 items) will defeat many research designs.	Hofstede's survey with only 34 items and four (five) dimensions is too simplistic and not sufficiently comprehensive (House et al., 2004).

Summary critique of Project GLOBE by:	The critique	Response / related discussions by Project GLOBE
Smith (2006)	At no point in the 818 pages did the GLOBE researchers (House et al., 2004) make plain whether they have aggregated the score for each individual survey item to the national level before the interrelations between items are explored.	Hanges and Dickson (2006) have now provided details of the rather more complex sequence of confirmatory analyses that were employed.
Peterson and Castro (2006)	House et al. followed the wrong scale development: They used individual level scales and aggregate (ILSA) rather than create aggregate scales approach (CSA) recommended by cross-cultural researchers.	The stated objectives for the GLOBE scales were constant with the CSA approach. House et al. believe that Peterson and Castro's statements about the individual-level nature of the GLOBE are based partly on a misreading of the GLOBE scale construction process (Javidan et al., 2006).
Graen (2006)	The GLOBE authors claim much cross-cultural ecological and construct validity for any meaningful practical recommendations to emerge.	The leadership and organizational culture scales demonstrated validity within a nomological network .All scales had reliability of .85 based on Cronbach alpha and correlation analysis. Additionally, the scales were tested for external validity using sources of information collected independently (Hanges and Dicksen, 2004).

Summary critique of Project GLOBE by:	The critique	Response / related discussions by Project GLOBE
Graen (2006)	The GLOBE questionnaires were developed through an insular process, without the collaboration of a larger group of heterogeneous scholars, thus the resulting constructs are not valid.	The process through which the GLOBE questionnaire was developed has been clearly articulated and demonstrates a collaborative and internationally inclusive exercise in cross-cultural research. GLOBE comprises over 160 scholars from 64 societies. 145 of these are country co-investigators who have been directly involved in creating and facilitating the project. They commented on relevance, understandability, translatability and face validity of the items as they pertain to their societies. The archival data served as a mechanism for construct validation of the culture dimension scales. In his work on leader-member relations, Graen provides no such evidence of his measure or construct validity.
Peterson (2006)	The book does an incomplete job of describing how several methodological issues central to cross-cultural research have been handled and description of the measurement-development is ambiguous.	Hanges and Dickson (2006) have now provided details of the rather more complex sequence of confirmatory analyses that were employed.
Graen (2006)	The GLOBE research is 'a large number of one-shot, self- report culturally biased survey studies'.	The GLOBE project used an extensive range of qualitative and quantitative analyses, including media analyses, individual and focus group interviews, archival data and unobtrusive measures in an integrative approach (House et al., 2004).
Graen(2006)	GLOBE used convenience sampling.	The sample is a selected sample; all industries were domestic organizations to ensure cross-cultural comparability. Middle managers were used in the sample because House et al. sought to query respondents who had experience both as a leader and as a follower (Hanges and Dicksen, 2004).

Summary critique of Project GLOBE by:	The critique	Response / related discussions by Project GLOBE
Graen (2006)	The GLOBE participants' responses were based on social desirability.	This is a gross misrepresentation of the instructions given to respondents. They were asked to indicate the way things are (Hanges and Dicksen, 2004).
Graen (2006)	Claims the labelling of the types of GLOBE leadership types was poor.	Graen misquoted the dimensions. Not 'types' – these are dimensions. Not 'Autocratic', as Graen incorrectly used, but 'Autonomous' and not 'shared' but 'participative and not defensive but 'self protective'. The incorrect labels provided by Graen reveal his own ethnocentric bias.
Graen (2006)	Inaccurate country clustering.	Graen's harsh criticism of the GLOBE clustering demonstrates a lack of knowledge generally about cluster analysis. The final GLOBE clustering labels were based on results from the GLOBE analysis and previous empirical studies as well as other factors such as common language, geography, religion and historical accounts.

The current debate: a summary of the critique of Hofstede's study

Table 2 below offers an overview of the critique of Hofstede's studies by key researchers in the field. Hofstede's responses or related discussions to the critique are also listed.

Table 2. Summary of the critique of the Hofstede's study

Critique of Hofstede by:	Critique	Response / related discussions by Hofstede
Warner-Søderholm (2010)	It is problematic in quantitative research to claim as Hofstede does that 'Cronbach's alpha reliability coefficients are irrelevant'. He does not report internal reliability results nor does he detail the step-wise EFA and CFA procedures and detailed findings	Through a factor analytical treatment of country averages for his value measures, Hofstede identified three cultural dimensions, one of which he further split into two components […]The four dimensions can be related to basic anthropological societal issues (Hofstede et al., 2010)

Critique of Hofstede by:	Critique	Response / related discussions by Hofstede
GLOBE team (Javidan et al., 2006)	Hofstede's work is not action research based. Action research involves a spiral of steps including fact finding, planning, action steps, evaluation, amended plans and further action.	Nations may not be the best units for studying cultures but they are usually the only kind available […]. Surveys should not be the only way to measure cultural differences. […] The dimensions found are assumed to have centuries-old roots; only data, which remained stable across two subsequent surveys, were maintained (Hofstede, 2002:1356).
GLOBE team (Javidan et al., 2006)	Ambiguous psychometric instrument design process with unclear properties on established psychometric requirements Hofstede's work is US centred and old: his work is based on a consulting project that he and his European colleagues conducted for IBM in the 1960s.	Data have since been validated against all kinds of external measurements; recent replications show no loss of validity (Hofstede, 2002: 1356). The IBM project locally recruited company researchers with local degrees - they conducted the pilot interviews and contributed substantially to the questionnaires and the interpretation results (Hofstede, 2006:885).
Kirkman et al. (2006)	Hofstede's framework does not tell us what complementary cultural values exist beyond Hofstede's five dimensions and what individual attributes (e.g. cognitive) might be more proximate to employee feelings or actions than cultural values.	Additional items should be both conceptually and statistically independent of the five dimensions already defined, and they should be validated by significant correlations with conceptually related external measures; candidates are welcome to apply (Hofstede, 2002:1356).

Critique of Hofstede by:	Critique	Response / related discussions by Hofstede
Kirkman et al. (2006)	As models are developed using moderators as key contingency factors, both theory development and advice to practitioners becomes increasingly narrow.	The five dimensions in the Hofstede model have both an empirical base and a theoretical (or even philosophical) rationale. Supported (at least in the case of the first four) by a classic and fundamental review of the existing insights about 'national character' and 'model personality' half a century ago (Inkeles and Levinson, 1954). Their presence in the GLOBE material speaks in favour of the thoroughness and professionalism of the GLOBE project (Hofstede, 2006:898).
McSweeney (2002)	Extreme, singular theories such as Hofstede's model of national culture are profoundly problematic. His conflation and uni-level analysis precludes consideration of interplay between macroscopic and microscopic cultural levels between the cultural and the non-cultural (McSweeney, 2002: 113).	These should not be the only way to model culture (Hofstede, 2002:1356).
McSweeney (2002b)	Hofstede credits absolute causality to national cultures. Essentially he endorses national cultural determinism (McSweeney, 2002:92).	What was measured were differences between national cultures. Any set of functionally equivalent samples from national populations can supply information about such differences. The country scores obtained correlated highly with all kinds of other data, including results obtained from representative samples of entire national populations (Hofstede, 2002:1356).

Critique of Hofstede by:	Critique	Response / related discussions by Hofstede
McSweeney (2002)	Hofstede relies on notions of national cultural sharedness: those values are common to all individuals within a nation and he applies a statistical aggregation, which can be problematic. Kirkman et al. further this critique to note that they strongly encourage greater attention to such important methodological details to strengthen the robustness of research in this category.	The cross-national analysis developed its concepts from the database file (Hofstede, 2006: 885). The five dimensions in the Hofstede model have both an empirical base and a theoretical (or even philosophical) rationale.
McSweeney (2002)	Hofstede inconsistently relies on a statistical averaging of heterogeneous 'components'. Using a large number of respondents does not itself guarantee representativeness.	Hofstede claims that 'if a sample is homogenous with regard to the criteria under study, there is very little to gain in reliability over an absolute sample size of 50 (respondents per country). I could therefore have done my research on 40 (countries) x 50 (respondents per country) x2 (survey rounds) – or 4000 respondents in total' (Hofstede, 2002:1356).
McSweeney (2002)	Hofstede's principle data comes from respondents working for one multi-national company: IBM. Questions arise as to whether the data reflect an organizational culture rather than cross-national data.	This data have proven to show valid cross-cultural differences (Hofstede, 2001).
Sivakumper and Nakata (2001)	Hofstede's work ignores within-country heterogeneity.	This does not matter so long as respondents were non-representative in the same way across countries.
Schwartz (1994)	The survey Hofstede designed may not have contained all relevant questions for a societal cultural study as it was originally designed for an organizational study.	Large-scale studies published since the 1980s have sustained and amplified my conclusions.

As shown in the tables above, each study has inherent strengths and weaknesses, and neither can be considered as providing the best way to denote national culture. Nevertheless, competing to develop the most suitable measures has proven to be healthy for both parties. The debate has led to further improvement to both research projects: Hofstede et al. in 2008

launched a pilot study of a new value survey measurement – the VSM2008, which tests Hofstede's current five dimensions plus two new cultural constructs of *Indulgence vs. Restraint* and *Monumentalism vs. Self-Effacement*. In addition, the Project GLOBE team have now made their survey and SPSS syntax freely available to academics (GLOBE, 2009).

Concluding remarks: the research field today

This author's recent journal search shows that during the last five years, academic journals have published at least 61 articles on the impact of societal culture upon elements of business communication (Warner-Søderholm, 2010).. Since 2004, with the availability of Project GLOBE data, researchers have no longer been limited to using Hofstede's predictive model in such studies – they have had a choice. Nevertheless, the great majority of these researchers have continued to apply Hofstede's cultural dimensions rather Project GLOBE's. Even though the application of the Project GLOBE's data has been limited, it can be argued that the this dataset may be more up to date and may offer a more comprehensive predictive model of culture. Hofstede's 34 questionnaire items, on the other hand, can be seen to be more manageable, in terms of both data collection and data analyses compared to GLOBE's ambitious 116-item questionnaire. Furthermore, even though very little tradition exists for specifically documenting validity and reliability with Hofstede research, his reputation and referral to face and construct validity are generally accepted as sufficient for many reviewers. A way forward for new research projects could be to combine elements of both Hofstede and Project GLOBE's research and thus combine specific dimensions for specific projects.

Conclusions

The title of this article was taken from an African proverb which questions whether a fight between two forces can in fact hurt the environment they belong to. The title questions whether such conflict between Hofstede and Project GLOBE has damaged the current cross-cultural research field. On reflection, the launch of Project GLOBE's research almost a decade ago seems to have acted as a catalyst for change in cross-cultural research. As stated by Minkov (2011), the debate may not have been so fierce had the Project GLOBE authors not presented their dimensions as improvements to Hofstede's five-dimensional model. Indeed, critiques of both camps concur that Hofstede and Project GLOBE may even have both failed to universally measure what they thought they were measuring (Minkov 2011). Clearly, there is no quick fix to the challenges researchers meet in terms of measuring culture. Scholars who follow in the

footsteps of giants such as Hofstede and Project GLOBE must always bear in mind that when we ask ordinary respondents to describe their own societies or their 'ideal managers', respondents' minds interpret such questions very differently, depending on variables such as gender, background, culture, age, industry, etc. We know we are measuring important underlying values in every case, but what is being specifically measured can always be questioned.

To return to my original question, I would propose that the elephants have fought a noble battle, but it is now time to make peace. The grass was trampled in the debate following the launch of Project GLOBE. Nevertheless, the research field of cross-cultural studies today seems to be flourishing. In conclusion, we are indebted to all the scholars who have contributed to this cross-cultural debate – especially Hofstede and the Project GLOBE team, as they have helped to place cultural studies firmly upon the map of management research this century. Thus the field, even if somewhat trampled, has been fortified.

References

Brown, P. and Levinson S. C. (1987), *Sociolinguistic models of politeness: some universals in language usage,* Cambridge University Press, New York.

Barker, E. (1975), "Review of the nature of human values by Milton Rokeach". *The British Journal of Sociology*, Vol. 26. 2, pp. 252–253.

Cardon, P. W. (2008), "A critique of Hall's contexting model". *Journal of Business and Technical Communication*, Vol. 22 (4), pp. 399–428.

Denison, D. R. (1984), "Bringing Corporate Culture to the Bottom Line", *Organizational Dynamics*, 13, pp. 5–22.

Ellison, E. (1975), *Contemporary Sociology*, Vol. 4. No. 6, pp. 638–639.

Geertz, C. (1973), *The interpretation of Cultures: Selected Essays by Clifford Geertz.* Basic Books, New York.

Gesteland, R. (2008), *Cross-cultural business behaviour,* Copenhagen Business School Press, Copenhagen.

GLOBE AUTHORS (2006), *Guidelines for the use of GLOBE culture and leadership scales* available at http://www.thunderbird.edu/index.htm (accessed 02.06. 2008)

Gooderham, P. and Nordhaug O. (2003), *International management. Cross boundary Challenges*, John Wiley and Sons, New York.

Graen, G. (2006), "In the eye of the beholder: cross cultural lessons in leadership from project GLOBE: a response viewed from the third culture-bonding model of cross-cultural Leadership", *Academy of Management Perspectives*, pp. 95–100.

Gupta, V., Sulley de Luque, M. and House, R.J. (2004), Multisource construct validity of GLOBE scales, In House, R.J., Hanges, P.J, Javidan, M., Dorfman, P. and Gupta, V. (Eds.). *Culture, Leadership, and Organizations: the GLOBE study of 62 Societies*, Sage, Thousand Oaks, CA.

Haire, G., Ghiselli, E.E. and Porter L.W. (1966), *Managerial Thinking: an International Study,* John Wiley, New York.

Hall, E. T. (1959), *The Silent Language*, Doubleday, New York.

Hall, E. T. (1976), *Beyond culture*, Doubleday, New York.

Harich, K. and LaBahn D. (1998), "Enhancing International Business Relationships: A Focus on Customer Perceptions of Sales Person Performance Including Cultural Sensitivity", *Journal of Business Research*, (42), pp. 87–101.

Hanges, P. J. and Dickson M. W. (2006), "Agitation over aggregation: Clarifying the development of and the nature of the GLOBE scales", *The Leadership Quarterly*, 17, (5), pp. 522–536.

Hofstede, G. (1980), *Culture's Consequences: International differences in work related values*, Sage, Beverly Hills, CA.

Hofstede, G. (2001), *Culture's Consequences*: *Comparing Values, Behaviours, Institutions and Organisations across Nations. Sage,* Thousand Oaks, CA.

Hofstede, G. (2006), "What did GLOBE really measure? Researchers' minds versus respondents' minds", *Journal of International Business Studies,* 37, pp. 882–896.

Hofstede, G., Hofstede, G. J., and Minkov, M. (2010), *Cultures and Organizations: Software of the Mind,* McGraw Hill, New York.

Holt, G. (2007), organizational culture and performance: a survey in Norway and Pakistan. DBA thesis: Henley Management College. *Henley on Thames*, Brunel University.

House, R. J., Javidan, M., Dorfman, P., and Gupta, V. (2004), *Culture, Leadership and Organisations: The Globe Study of 62 Societies,* Sage, Beverly Hills, CA.

Inglehart, R., Basáñez, M., Diez-Medrano, Halmal, I. and Luijkx, R. (Eds.). (2004*), Human beliefs and values: a cross-cultural sourcebook based on the 1999–2002 values surveys,* Siglo XXI, Mexico.

Javidan, M., House, R. J., Dorfman, P., Gupta, V., Hanges, P. J., and Sulley de Luque, M. (2004), Conclusions and future directions. In: House *et al.* (Eds.). *Culture, Leadership, and Organizations*: *The GLOBE study of 62 Societies*. Sage, Thousand Oaks, CA.

Javidan, M. *et al.* (2006), "Conceptualising and measuring cultures and their consequences: a comparative review of Globe's and Hofstede's approaches". *Journal of International Business Studies*, 37, pp. 879–914.

Kirkman, B. L., Lowe, K. B., and Gibson C. (2006), "A quarter century of *Culture's Consequences*: a review of empirical research incorporating Hofstede's cultural values framework", *Journal of International Business,* 37, pp. 285–320.

Kitay, J. (2002), "From prophets to profits: the occupational rhetoric of management consultants", *Human relations*. Vol. 60, (11), pp. 1613–1640.

Kluckhohn, F. and Strodtbeck, F. (1961), *Variations in Value Orientation*, Harper and Row, New York.

Kogut, B. and Singh, H. (1988), "The effect of National Culture on Choice of Entry Mode", *Journal of International Business Studies,* 19 (3), pp. 411–432.

McClelland, D. C. (1985), *Human Motivation*, Scott: Foreman, Glenview, IL.

McCrae, R. R. *et al*. (2008), "Interpreting GLOBE societal practices scales", *Journal of Cross Cultural Psychology*, 39, pp. 805–810.

McSweeney, B. (2002), "Hofstede's model of national cultural differences and their consequence: a triumph of faith – a failure of analysis", *Human Relations,* 55(1), pp. 89–118.

McSweeney, B. (2002b), "The essentials of scholarship: A reply to Geert Hofstede", *Human Relations*, 55, pp. 1363–1372.

Miller, D. (2002), "Factors associated with workers inclination to participate in an employee involvement programme", *Group and Organizational Management*, 17, pp. 414–430.

Minkov, M. and Blagoev, V. (2011), "What do Project GLOBE's cultural dimensions reflect? An empirical perspective". *Asia Pacific Business Review*, pp. 1–17. Available at: http://dx.doi.org/10.1080/13602381.2010.496292 (accessed 20. 04. 2011)

Oyserman, D. (2002), "The lens of personhood: viewing the self and others in a multicultural society", *Journal of Personality and Social Psychology,* 65(5), pp. 993–1009.

Parsons, T. and Shils, E. (1951), *Toward a general theory of action*. New York, Harper and Row.

Peterson, M. F. and Castro, S. L. (2006), "Measurement metrics at aggregate levels of analysis: implications for organizational culture research and the GLOBE project". *The Leadership Quarterly*, 17, pp. 506–521.

Rokeach, M. (1968). *Beliefs, Attitudes and Values: A Theory of Organisation and Change*, Jossey-Bass, San Francisco.

Schein. E. (1992), *Organisational culture and leadership* (2nd ed.), Jossey-Bass, San Francisco.

Schein, E. (2004), *Organizational culture and leadership*, Jossey-Bass, San Francisco.

Schein, E. (2006), *Organizational culture and leadership*, (3rd ed) Jossey-Bass, San Francisco.

Schwartz, S. H. and Bilsky, W. (1990), "Toward a Theory of Universal Content and Structure values: Extensions and Cross-cultural Replications", *Journal of Personality and Social Psychology*, 58, pp. 878– 891.

Schwartz, S. H. (1994), Cultural dimensions of values: towards an understanding of national differences, in U. Kim, H. C. Triandis, C. Kagitcibasi, S. C. Choi and G. Yoon (Eds.) *Individualism and Collectivism: Theoretical and Methodological Issues,* Sage, Thousand Oaks, CA. pp. 85–119.

Schwartz et al. (1999), "Multi Method Probes of Basic Human Value" in J. Adamopoulos and Y. Kashima (Eds.), *Social Psychology and Cultural Context: Essays in honour of Harry Triandis,* Sage, Newbury Park, CA.

Sivakumar, K. and Nakata, C. (2001), "The stampede toward Hofstede's framework: avoiding the sample design pit in cross-cultural research", *Journal of International Business Studies*. 32 (3), pp. 555–574.

Smith, P. (2006), "When elephants fight, the grass gets trampled: the GLOBE and Hofstede projects", *Journal of International Business Studies*, 37, pp. 915–921.

Triandis, H. C. (1975), *The analysis of subjective culture*, John Wiley, New York.

Triandis, H. C. (2004), "The many dimensions of culture", *Academy of Management Executive*, 18, pp. 88–93.

Trompenaars F. and Hampden-Turner C. (1998), *Riding the waves of culture Understanding diversity in global business,* McGraw Hill, New York.

Warner-Søderholm, G. (2010), *Understanding Perceptions of Cultural and Intracultural Societal Practices and Values of Norwegian Managers*, Doctor of Business Administration thesis PowerGen Library, Henley Business School, University of Reading.

A Guide to Multivariate Analysis in Cross Cultural Research

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Abstract

There is much debate surrounding the proper way to operationalize and measure the concept of culture. Positivistic Likert scale survey-based research designs must include multivariate techniques including factor analysis and tests for internal validity and reliability of instruments. This paper suggests a positivistic, quantitative methodology based on sound multivariate techniques applied to interval-level data (e.g. Likert scales of at least five response categories). Multivariate techniques suggested herein include exploratory and confirmatory analysis; a review of rotational methods; and confirmatory and discriminate validity tests. This review offers both methodological and analytical contributions.

Introduction

Cross cultural researchers – including giants in the field of cultural studies such as Triandis, Hofstede, and the GLOBE authors – seem to agree that there are several universally accepted and supposedly measurable dimensions of culture. This inaugural issue of the Journal of International Doctoral Research (JIDR) contains an article from Warner- Søderholm that does well to outline and summarize the salient discussions relative to cross-cultural modeling. Such discussion will not be repeated here; instead, the reader is urged to closely read Warner-Søderholm's summary of the theory of cultural dimensions and modeling. In this article, we intend to offer suggestions to future cross-cultural researchers relative to methodological and analytical designing and planning in order to objectively and thoroughly discourse cross-cultural measurement.

The purpose of this article is to provide a recipe for testing the instruments used to measure dimensions of culture. We suppose this article could be summarized by Wrenn (1997):

> "…measurement, as in scientific discovery in general, [is] an iterative process by which we improve our measures by measuring our theory, which in turn improves our theory, which suggests better measures" (p. 40)

It would seem that many 'researchers' have strayed from sound multivariate research techniques. Are we properly measuring cross-cultural theory? This question has led to some heated debate in the literature (as one example of this heated debate, see the entire issue of Journal of International Business Studies, vol. 37, 2006). To our knowledge, no one has offered, and few have held true to, the steps necessary to validate the psychometric properties of an instrument. We hope what is offered herein is taken for what and how it is intended: to

suggest sound multivariate analysis techniques and a plea for researchers to include such techniques in their methodologies and analyses. Also, and as always, we hope this spurs some discussion. After all, discussions in the literature are, to coin a phrase from Wrenn (1997), an "iterative process".

Theory and Context

Even though many prominent scholars agree that culture is historically determined, learned, persistent, contains subjective and objective elements, is collective and shared, and provides solutions to life's problems, these same scholars universally admit that culture is difficult to grasp. This difficulty is due, in part, to the lack of consistency in developing universally meaningful definitions, dimensions, scales, and measures (Earley 2006; Holt 2007). Researchers tend to agree on a few universally accepted dimensions of culture such as (i) individualism/collectivism; (ii) power distance, and (iii) assertiveness and role differentiation based on gender. However, how these dimensions (e.g. constructs) are actually measured is hotly contested in the literature. Examples of these sometimes heated debates include Hofstede (2006), Javidan, et al. (2006), and Minkov and Blagoev (2011) – among others. Cross-cultural research projects must settle on a framework so meaningful comparison can be made (Earley 2006). This framework inherently must contain well defined dimensions, scales, and measurements in order to provide meaningful differences and similarities across cultures. Cavusgil and Das (1997) provide an appreciable approach to cross-cultural research beginning with theory and construct definition. Repeatedly, cross-cultural researchers emphasize the importance of properly defining the paradigm of culture, its conceptualization relative to the study at hand and the context being studied, and the underlying dimensions and means of measurement (see for example Earley (2006)). It is not the purpose of this paper to suggest how to define culture or the context. In fact, none of the following elements of empirical research design will be discussed herein. It is assumed (and we recognize that this is a risky assumption) that researchers understand the complexities of the methodological issues of the three major activities of empirical research (Schwab, 2005):

1. Measurement
2. Research Design
3. Analysis

Researchers should pay close attention to such topics as scaling, instrumentation, sample design, level of measurement, and unit of analysis – to name but a few stumbling blocks. For further information about measurement, design, and analysis, refer to a good quality research methods text such as Schwab (2005).

The focus of this paper is to suggest a recipe to follow once the researcher has collected data. This recipe is provided to help guide research and to test for internal validation – in short, to test our instruments in hopes to 'improve our measures' (Wrenn, 1997). To that end, this paper will discuss the following methodological and analytical steps (Bertsch, 2012a, 2012b).

Step 1: Examining the data (missing data and outliers/influential cases)
Step 2: Test for normality
Step 3: Exploratory factor analysis (EFA)
Step 4: Confirmatory analysis
Step 5: Creating summated scales
Step 6: Validity

Step 1: Examining the data

"Make friends with your data." (Rosenthal, from Azar, 1999).

Examination of the data includes dealing appropriately with missing data, recoding survey items if and when necessary (e.g. reverse coding), identifying outliers, and testing the underlying data structure to ensure that multivariate data analysis techniques are appropriate. These techniques are well defined in the analytical literature such as Hair, et al. (2006, 2010), Malhotra (2007), and Field (2009).

Missing Data

Approaches to handling missing data depend on the circumstances including the sample size, the instrument, the unit of measure, and other issues surrounding a given research project. Because of the sheer variety of issues one must consider when addressing missing data, a full discourse is not offered herein. Instead, the reader is advised to address missing data carefully. For more information concerning missing data, Ramsey and Schafer (2002) is a good resource.

Outliers and Influential Cases

Factor analysis is very sensitive to outliers (Field 2009; Hair, et al., 2006, 2010; Pallant 2007). Outliers are defined as an unusually high or low value on a specific variable that makes that observation (case) stand out from the others (Hair, et al., 2006, 2010). Outliers and influential cases can be considered as cases which are substantially different from the data's salient movements. The presence of outliers and/or influential cases may result in biased estimates. An outlier, by its nature, is very different from all of the other scores. Besides testing for outliers by analyzing errors, researchers are wise to look at whether or not specific cases have impact on the estimation of the parameters. To see if substantial differences in estimated coefficients may be a result of the presence of outliers, researchers should analyze whether to delete a suspicious case or keep the case. Such a decision is necessary in order to determine whether a specific model is stable across the sample or the model is biased due to some influential case(s). Such an analysis will unmask outliers (Field, 2005). Therefore, it is necessary to search for outliers and influential cases in order to address them accordingly. This requires that each variable be independently checked.

For the purpose of identifying outliers, there are three techniques suggested by Hair et al. (2006, 2010); namely univariate, bivariate, and multivariate outlier analysis techniques. For the univariate detection, the distributions of scores for each individual variable in the analysis are examined. The bivariate detection focuses on specific variable relationships and involves examining scatterplots and residuals based on each of the standardized summated scores for each construct. The final diagnostic method used is the assessment of multivariate outliers with the Mahalanobis (D^2) measure.

Univariate outlier detection requires one to examine the observations on each item individually. Histograms, stem-and-leaf plots, and boxplots help the researcher by indicating the appearance of outliers and extremes in the distribution of the data for individual survey items. The data values for each item should then be converted to standard scores and an interval should be established as the threshold for designation of an outlier. This specific threshold value of standard scores will vary by sample size and should be determined in accordance with the suggestions made in the literature such as Hair et al. (2006, p. 77; 2010, p. 66-67) and Field (2009, p. 153).

Bivariate analysis of outliers requires multiple scatterplots. Although Hair et al. (2006, 2010) suggests limiting the number of scatterplots along a logical demarcation such as running plots between independent and dependent variables, typical cross-cultural comparative studies have no dependent variable and, therefore, no natural demarcation. Therefore, it should be decided to analyze all possible bivariate combinations. For each of the iterations, a fit line for all data values should be included along with an analysis of the standardized residuals that exceeded the ± 2.5 threshold. Cases falling beyond this ± 2.5 threshold are categorized as potential outliers. Hair et al., (2006, 2010) state that it is common for some cases to fall just outside this threshold even though they may not actually be 'extreme cases'. Field (2009) suggests using a threshold of ± 3.0.

Multivariate outliers are assessed with the Mahalanobis D^2 measure. D^2 is a multivariate assessment of each case across a set of variables, and provides an overall assessment of each case's distance in multidimensional space from the mean center of all cases (Hair, et al., 2006, 2010). A multiple regression analysis involving all of the variables should be run in order to examine the complete variate. The D^2 measure is then divided by the degrees of (D^2/df) in order to identify significant outliers. Hair et al. (2006, 2010) suggest that conservative levels of significance such as 2.5 should be used as the threshold value for identifying possible outliers.

In addition to the tests for outliers described above, several residual statistics can be used to investigate a particular case's influence on the data structure. One of them is the adjusted predicted value for a case when this case is removed from the analysis. Such an analysis will tell the researchers whether or not the case has substantial influence on the estimated parameters and whether or not the case should be retained for further analysis. Statistics such as Cook's distance (where a value greater than one (1) may be a source of concern), Leverage (where values between zero (0) and one (1) in which 0 indicates no influence and 1 complete influence); Mahalanobis distances (where values greater than 25 are a source of concern for larger samples (e.g. 500); or values greater than 15 are problematic if the sample size is 100; and values greater than 11 are problematic if the sample size is small) (Field, 2005).

Step 2: Testing normality

"Is Factor Analysis appropriate?" – Exploring Assumptions

The next step in 'making friends with the data' (Rosenthal, from Azar, 1999), is to test the assumptions that are necessary in order to proceed with multivariate analysis techniques such as factor analyses. Researchers should follow sound advice in the literature concerning the steps necessary to test the underlying data structure to ensure factor analysis is appropriate (Field 2009; Hair, et al., 2006, 2010; Malhotra 2007; Pallant 2007). The steps contained herein are limited to testing the normality of the underlying data. Homoscedasticity, linearity, and correlated errors are typically used in dependence or predictive relationships (Hair, et al., 2006, 2010). If your research model and/or hypotheses include any dependence or predictive relationship, please consult with the literature for tests for homoscedasticity, linearity, and correlated errors.

Normality

The t, z, and F statistics are all based on the fundamental assumption that the underlying data approximates a normal distribution (Field 2009; Hair, et al., 2006, 2010). Hair, et al. (2006, 2010) strongly advise that summated scales cannot be created without first testing the underlying structure of the data using EFA or CFA techniques. Exploratory factor analysis assumes the underlying data has a reasonably normal distribution. Therefore, it is necessary to assess the data for normality.

Although the literature is full of visual methods used to test normality (P-P plots, Q-Q plots, superimposed normal curves overlaid on histograms, etc), each of these visual methods is subjective and open to interpretation by the researcher (Field 2009). How much deviation is acceptable when visually interpreting these graphs and plots? Instead of relying solely on these subjective visual interpretations, one should consider the advice of Hair et al. (2006, 2010) and Field (2009) to quantifiably analyze the normality of each variable. Hair et al. (2006, 2010) suggest the following two formulae (p. 81):

$$Z_{skewness} = \frac{skewness}{\sqrt{\frac{6}{N}}} \qquad Z_{kurtosis} = \frac{kurtosis}{\sqrt{\frac{24}{N}}}$$

Similarly, but a bit different, are two formulae offered by Field (2009) where the denominator in each of the above formula is replaced by the respective standard error ($SE_{skewness}$ and $SE_{kurtosis}$). Both Field (2009) and Hair et al. (2006, 2010) caution researchers that sample sizes can adversely affect these simple tests for normality. One easily sees after a quick glance at the

above formulas that an increase in *N* would result in an increase in the respective *Zskewness* or *Zkurtosis* score. This could easily distort the test for normality. In fact, Field (2009) suggests to not use such a test when sample sizes are too large. Admittedly, the word 'large' is a relative term; however, Field (2009) does explain that sample sizes that approach or extend beyond n=200 present problems when using quantitative tests for normality. In samples of 50 or fewer observations, significant departures from normality can have a substantial impact on the results. For sample sizes of 200 and more such impact diminishes (Hair, et al., 2006, 2010). Hair et al. (2006) offers that, "If either calculated z value exceeds the specified critical value, then the distribution is non-normal in terms of that characteristic", (p. 82). The critical z value based on a .01 significance level is ± 2.58. A calculated z-value exceeding ± 2.58 indicates that the assumption of normality of the distribution, for any given variable, at the .01 probability level can be rejected.

At the item level, those with raw skew scores beyond a ±1.0 range drew the most scrutiny as Hair et al. (2006, 2010) suggest such skewness indicates a substantially skewed distribution. As for problems with kurtosis, Hair et al. (2006, 2010) suggest a similar rule of thumb but with a ±3.0 interval to evaluate the raw kurtosis score.

Hair et al. (2006, 2010) caution that statistical tests of normality with larger samples are quite sensitive and any use of statistical tests should include visual inspection of graphical plots to assess the degree of departure from normality. A visual detection is strongly suggested and should include P-P plots, Q-Q plots, and histograms with superimposed normal distributions. Field (2009) argues that a three-way balance must be struck between sample size, normality, and robustness. Field (2009) outlines an interesting and rather heated dialogue pitting Games against Dunlap and Levine in the early 1980s. According to Field (2009, p. 156), the exchange ended with Games pointing out important issues relative to transforming data such as (i) directly affecting theoretically developed hypotheses; and (ii) introducing the possibility that the entire construct will be adversely affected and measured differently leading to problems with interpretation. Field (2009, p. 156) concludes that the risk of applying a 'wrong' transformation may be worse than the consequences of interpreting the data with untransformed data. Should tests for skewness and kurtosis yield questions, the researcher should proceed with caution. Other tests for the appropriateness of factor analysis (e.g. Kaiser's measure of

sampling adequacy (MSA)) shall be delayed until the underlying data structure is actually explored during EFA and CFA.

At this time, a final word on testing the assumptions is necessary. Researchers often find data that is significantly skewed in survey research using Likert scale items. This is due mostly to the respondents' frequent selection of the upper or lower extremes of the Likert scales.

Step 3: Exploratory Factor Analysis (EFA)

Factor analysis allows the reduction of a set of observed variables to a smaller set of variables (for further information, see Field (2009); Hair, et al. (2010); and Hinkin (1998)). Factor analyses is intended to first *explore* the usability of the scale items and then to *confirm* the underlying data structure and relationship(s) between the actual survey item variables and the latent variables that are purportedly being measured. The purpose for this section is to outline the steps used to conduct exploratory factor analysis. This will be followed by a discussion of the steps used in confirmatory analysis.

The study of 'culture' is a rather fuzzy concept that is difficult to conceptualize (Earley 2006). Each dimension of culture (Aggressiveness, Individualism, etc) cannot be directly measured. When a concept cannot be directly measured (i.e. it is a "latent variable"), it requires several survey items that are used to attempt to measure the concept (Field 2009). Exploratory factor analysis is an analysis technique that allows the researcher to simplify data from a large number of survey items (variables) to a smaller number of latent variables (Hair et al. 2003). When analyzing data from multiple samples, a researcher should conduct exploratory factor analysis on each of the datasets separately (see for example Holt (2007) or Bertsch (2009)).

To guide the process of exploring the existence of factors in cross-cultural datasets, a list of steps was developed from the collective literature. These steps are given below and should be followed for each of the constructs in each dataset. The first three steps are necessary to determine whether factor analysis is appropriate and are used to determine the degree of correlation between relevant variables in each factor. The first three steps should be performed on ***each and every*** construct (Bertsch, 2009).

1. ***Partial Correlations***. This is the amount of unexplained correlation within a set of variables[4]. If a factor does exist within the given variables, the partial correlations should be relatively small. Values beyond the ± 0.7 interval are considered inappropriate for factor analysis. Preferably, partial correlations should be within the interval of ± 0.5 (Field 2009; Hair, et al., 2006, 2010).
2. ***Bartlett's test of sphericity***. This will determine whether the correlation between each of the survey items (that purportedly measure a single construct) is statistically significant. In other words, are the correlation coefficients of the actual survey items significantly different from zero in order for one to reasonably conclude that the items are, indeed, measuring a single latent variable? The χ^2 and significance values are keys to determine appropriateness of the dataset relative to this test (Field 2009; Hair, et al., 2006, 2010).
3. ***Measure of Sampling Adequacy (MSA)***. A common method of measuring sampling adequacy is to use the KMO test embedded in most statistical analysis software packages. This test represents the ratio of squared actual correlation between variables to the squared partial correlation between variables. The possible values range from zero (0) to one (1). Values above 0.5 are considered 'acceptable'; values above 0.7 'good'; values above 0.8; 'great' and values above 0.9 'superb'[5] (Field 2009; Hair, et al., 2006, 2010).

After performing steps 1, 2, and 3, the researcher can then determine whether any of the variables within a construct are worthy of factor analysis. The remaining variables, if any, are then subjected to the remaining steps of exploratory factor analysis.

4. ***Principle Components Analysis (PCA).*** A step in factor analysis is to determine the method of extraction. Principle Components Analysis is typically chosen as the literature supports this extraction method as the most common, it is a psychometrically sound procedure, and it is conceptually less complex than other methods of factor analysis. It is acknowledged that PCA is not truly 'factor analysis' but has been treated as such in the literature (Field 2009; Hair, et al., 2006, 2010). Kaiser's suggestion of

[4] Partial correlations are represented in the anti-image correlation matrix in SPSS.
[5] SPSS provides the overall KMO value for all variables selected. Additionally, the MSA values for individual variables are the diagonals of the anti-image correlation matrix.

'Eigenvalues>1' was also employed when assessing the number of factors extracted (Field 2009; Hair et al. 2003; Hair, et al., 2006, 2010).

5. ***Factor Loadings.*** Depending on the size of your samples, minimum factor loadings will vary. The significance of factor loadings is dependent on the sample size. As reported by Field (2009), Stevens suggests that samples of 100 requires factor loadings of 0.512 in order to be considered significant while samples of 200 require factor loadings of 0.364 (Field 2009, p. 644). For specific factor loadings based on sample size, see Hair et al. (2006, p. 128).
6. ***Communality.*** This is a measure of the amount of shared (common) variance in a particular latent variable. The value of the communality is the amount of variance for each variable that can be explained by the extracted factor(s). Although there are no real 'rules-of-thumb' to guide researchers, communalities of each variable should be considered in conjunction with the factor loadings when determining the retention of variables in a factor solution (Field 2009; Hair, et al., 2006, 2010).

Steps 4, 5, and 6 will determine whether variables within a given construct should be eliminated. Once these steps are exhausted for each construct within each dataset, a final step (Step 7) is necessary to determine the final factor loadings within each group of constructs. Step 7 cannot be completed during the initial phase of exploratory factor analysis because only one construct at a time is being explored. Rotation requires at least two factors. Only after steps one through six, with the proper elimination of specific items, can the researcher proceed to rotation.

7. ***Rotation Method.*** When choosing a rotation method, one must consider whether there will be correlation between any of the factors. An oblique rotational method is more flexible than the orthogonal rotation methods because the rotated factor axes need not be held constant at a 90° right angle. Removing the limitation that the axes remain constant at 90° allows correlated factors to be identified (Field 2009; Hair, et al., 2006, 2010). An oblique rotation method typical in cross-cultural research due to the expected correlation between some of the constructs. For example, it is expected that Assertiveness will positively correlate with Performance Orientation (House et al. 2004) as the GLOBE authors themselves witnessed positive correlation between these two constructs. In this regard, 'direct oblimin' is often used with a delta of zero (0). Based

on the factor loading threshold identified earlier, the researcher will be able to determine the items retained for each construct.

Factor analysis is referred to as "item reduction" for a reason. The above discussion, taken from the multivariate techniques literature, will help the researcher perform the necessary steps to ensure proper testing of the underlying structure of the data. The end result of these steps will be to determine which variables, if any, will be retained for each latent variable. "Never create a summated scale without first assessing its unidimensionality with exploratory or confirmatory factor analysis" (Hair, et al., 2006, p 139 box). Only after assessing the data structure (using EFA techniques described above) and testing each construct for convergent validity (described in the next section) is a researcher prepared to create summated scales.

Further discussion concerning Orthogonal vs. Oblique Factor Rotation

Many researchers do not report their rotational method and those that do often report an orthogonal rotation method (de Barros 2002; Grennes 1999; Hofstede 2001; Holt 2007; House et al. 2004). The use of an orthogonal rotation method, although popular, does not fit with factors that are theoretically related and may share some variance (Field 2009; Hair, et al., 2006, 2010). GLOBE, Hofstede, and others have found correlations between extracted factors and the respective theoretical constructs (de Barros 2002; Den Hartog 2004; Gelfand et al. 2004; Grennes 1999; Hofstede 1980, 2001; Hoppe 1990; House et al. 2004; Javidan 2004). Variance from these theoretically similar yet operationally distinct factors is likely shared variance (Gupta et al. 2004; Hanges and Dickson 2004; House et al. 2004; Javidan et al. 2004) and an oblique rotational method is much more fitting when there exists the possibility of shared variance in the studied constructs (Field 2009; Hair, et al., 2006, 2010).

An oblique rotation allows for inter-correlations between extracted factors (cultural dimensions) as opposed to assumed independence between extracted factors (Field 2009; Hair, et al., 2006, 2010). Hofstede (1967; 2001, p. 32 & 39) claims the choice of rotational method is only "arbitrary" and that researchers typically experiment in order to find a structure that is the most clearly interpretable. Interestingly, when Hofstede made this claim in 2001, he was citing his own work from 1967. It does not seem (at least to this author) that the choice of an oblique vs. an orthogonal rotational method is 'arbitrary'. On the contrary, both Hofstede and the GLOBE authors have indicated significant correlations between constructs within their

respective cultural models (dimensions). The choice of an oblique rotational method during factor analysis is offered here as a contribution to cross-cultural studies.

Step 4: Confirmatory Analysis

Dubbed the opposite of Exploratory Analysis, Confirmatory Analysis will test (e.g. confirm) the relationship or lack of a relationship that exists between two or more constructs based on theory developed and applied *a priori*. EFA – the techniques described in the previous section – explores the structure of the data regardless of theory (Hair, et al., 2006, 2010). In this regard and to effectively approach the confirmatory analysis, effort is made to confirm that the constructs included in a study are, indeed, 'constructs' and that there exists sufficient evidence to believe that the constructs are separate, independent constructs. To begin, it is necessary to first discuss what is meant by the term 'construct'. This is then followed by a brief review of construct validity. The logical sequence is to then discuss confirmatory analysis in order to assess construct validity. To that end, convergent and discriminant validity will need to be assessed relative to the constructs and measures in cross-cultural studies. Assessing convergent validity, although cumbersome, is rather straightforward and is to be conducted on the individual indicators within each theoretical construct. However, discriminant validity is easier to test on summated scales and, therefore, the analysis of discriminant validity can be conducted after the summated scales are created.

Construct: A Brief Review

To begin, a brief discussion surrounding the idea of a 'construct' is in order. Herein, the word 'construct' has and will be used to refer to a particular cultural dimension. This is not a completely accurate use of the word 'construct'. Rather, and to be more accurate, each dimension ought to have been referred to as a *latent* variable. That is to say, and as the terminology has been used herein, each cultural dimension is really an 'unobservable' dimension. It is likely that during your literature review, you discussed 'culture' as being made up of visible, objective elements (observable) and invisible, subjective elements (unobservable). Intuitively, it becomes easy to recognize that each cultural dimension is, indeed, a latent variable (construct). Since it is desirable to measure that which cannot be directly observed, scale items are typically adapted from prior literature in order to assess each cultural dimension. It is difficult, if not impossible, to create scale items that directly measure an unobservable concept. Therefore, any method of measurement will, undoubtedly, have

error. So, as is true for most research, constructs cannot be fully operationalized. Nevertheless, there are ways to test (confirm) the existence of constructs and the validity of the measures used to assess those constructs (Field 2009; Hair, et al., 2006, 2010).

Construct Validity: A Brief Definition

Constructs cannot be directly measured, even with multiple indicators. Therefore, the validity of indicators (a.k.a. measures, survey items) must be assessed to determine to what extent the indicators are measuring the unobservable construct. This is called construct validity. That is to say "[The] extent to which a set of measured variables [indicators] actually represent the theoretical *latent construct*…" (Hair, et al., 2006, p. 707). The components of construct validity include convergent validity, discriminant validity, and face validity. Face validity of the constructs and the survey items can be assessed during pretests of the instrument. Discriminant validity will be discussed later in the discussion covering summated scales. The component of construct validity discussed here will be convergent validity[6].

Convergent Validity

Convergent validity is typically defined as the extent to which independent measures (e.g. survey items) of the same concept correlate with each other (Hair et al. 2003; Singleton and Straits 2005). Some researchers argue that convergent validity can only be assessed by using multiple methods to measure the same latent construct and then to test whether the multiple methods correlate to each other. Unfortunately, multi-method tests of convergent validity test (confirmatory analysis) are not often available to most researchers due, in no small part, to costs and time. Multi-method test of convergent validity is often referred to as MTMM. The method of confirmatory analysis for a typical study is to measure construct validity by first assessing convergent validity and then creating summated scales to better analyze discriminant validity for the indicators and constructs used/borrowed. To begin, convergent validity should be assessed by analyzing the correlations between each of the indicators and the other indicators contained in the study. Most studies limit the assessment of convergent validity to the analysis of the indicators contained in the chosen instrument for each construct. The steps

[6] Although it is impossible to directly assess construct validity, there exist procedures which researchers can use to develop measures and investigate if such measures have evidence of construct validity. Many research methods textbooks will provide the necessary information to assess construct validity which will likely include content validity, reliability, convergent validity, discriminant validity, criterion-related validity, and nomological networks. One such methods text is Schwab (2005).

to follow in order to assess convergent validity include (i) factor loadings, (ii) variance extracted, and (iii) reliability. In each case, the items selected for convergent validity should be limited to the items from the instrument that are supposed to measure a specific construct. This is an iterative process and each construct should be assessed separately.

Factor Loadings

When testing for convergent validity, Hair, et al. (2006, 2010) suggest that factor loadings should be 0.50 or higher but ideally will be 0.7 or higher.

Variance Extracted

The test for variance extracted should be to determine whether the total variance extracted exceeds 0.5. The threshold of 0.5 is used as this indicates that more than 50% of the variance is explained by the observed variables which, in turn, means that less than 50% of the variance is caused by error.

Reliability

Cronbach's alpha coefficients are typically used to assess reliability and the threshold of 0.6 is often suggested (Hair, et al., 2006, p. 777).

Factor loadings, variance extracted, and reliability tests are conducted to assess whether the indicators from the survey are converging on the same latent construct. Researchers should be open to removing survey items during EFA and CFA steps. After all, EFA and CFA are generally referred to as 'item reduction'.

Step 5: Creating summated scales

The previous analysis addressed one aspect of confirmatory analysis (convergent validity). The next steps will be to create summated scales based on the previously conducted analyses and the theory. Specifically, summated scales rely on conceptual definitions, dimensionality, reliability, and validity. Conceptual definitions and dimensionality should have already been satisfied by virtue of the theory described in a thorough literature review, the scale development described in the methodology chapter, and the exploratory and confirmatory analysis conducted earlier. For the remaining subtopics which will be included below, discussion will include creating the actual summated scales and testing ***discriminant*** validity of

the resulting summated scales. Coupled with convergent validity tested previously, discriminant validity is another testing in the effort to illustrate overall construct validity. Although reliability is normally discussed as part of the creation of summated scales, reliability of the scales should be assessed and discussed during confirmatory analysis.

Creating the Summated Scales

The main purpose of a summated scale is to capture multiple aspects of a concept in a single measure. When reliability and validity of the factor structure have been documented, either in the literature or through statistical techniques, summated scales are the preferred method among researchers (Hair, et al., 2006, 2010). Summated scales are to be created after the exploratory techniques (statistical) and confirmatory techniques (theoretical) discussed previously. Summated scales should only be created on items that satisfy theoretical constructs (CFA) ***and*** statistical tests (EFA) conducted previously.

Step 6: Discriminant Validity

Unlike convergent validity discussed in a previous section, discriminant validity assesses whether one particular construct is actually different from other theoretically different constructs. Discussion of discriminant validity was delayed until this stage of the data analysis because it is easier to assess discriminant validity on the summated scales of each latent construct. To that end, analysis of discriminant validity seeks to determine whether the summated scales used to measure each construct in a given study are different from the summated scales used to measure the other constructs in the same study (Hair, et al., 2006, 2010).

Theoretically, each summated scale is measuring a different and distinct cultural dimension. During exploratory factor analysis, researchers have the option of choosing an oblique rotational method to allow for correlations between factors. This choice is often due to theoretical similarities that exist across chosen cultural dimensions, constructs, and measures. The oblique rotation allows correlation across the factors. The test for discriminant validity will determine any significant correlations between summated scales. That is to say, each summated scale should have a statistically insignificant correlation with any and all other summated scales in the resulting model. However, there may be some that exhibit correlation due to the nature and theoretical development of certain constructs.

Conclusions

The approach to multivariate techniques described above were gleaned from the literature. In this regard, key decisions about issues concerning factor analyses were explored: (i) Should factor analysis be applied?; (ii) Should the factor analysis be carried out using the variable-by-variable or object-by-object correlation matrix?; (iii) Which factor model should be used?; (iv) How many factors [if any] should be extracted?; (v) Should the initial solution be rotated, and if so, using what method of rotation? Churchill (1992). Hair et al. (2006) describe factor analysis as exploring and defining the underlying structure among the variables of analyses. This should include construct validity for each dimension outlined in a study along with individual factor analyses for the eight constructs. By definition, each of the questions in a survey measure underlying latent constructs of the respondents. As part of any analysis of the data for a given study, the validity of each construct should tested.

Theoretical definitions are based on prior research and define the nature of each concept; therefore making conceptual definitions and theoretical definitions synonymous (Hair, et al., 2006, 2010). Theory is necessary for not only operationalizing each concept but for interpreting the results of the measurement exercise (Malhotra 2007). It has been said that theory drives better measures and that better measures improve theory. This 'chicken and the egg' paradox is best described by Wrenn (1997):

> "…measurement, as in scientific discovery in general, [is] an iterative process by which we improve our measures by measuring our theory, which in turn improves our theory, which suggests better measures" (p. 40)

A specific outcome from the theory-measurement sequence would be to validate and report the use of existing scales (or new scales such as Hofstede Values Survey Module aptly named the VSM 2008). Such new measures could result in better measures for the existing cultural dimensions such as Power Distance, Individualism, and Uncertainty Avoidance which have been problematic in past research. In addition to the additive nature of theory and measurement, further research would allow constructs and measures to be continually validated. In this regard a nomological network could be developed with mixed methods, mixed measures, mixed traits and better validation of the cultural constructs presented in this study.

Emerging advanced methods

This article described methods based on latent variables and factor analysis. An emerging method that will likely garner increased attention in cross cultural research studies is structural equation modeling (SEM). SEM is a much more sophisticated extension of factor analysis with the addition of multiple regression techniques and allows the researcher to test the entire dataset in a single fell swoop as SEM can examine several relationships simultaneously (Hair, et al., 2010).

SEM is a statistical analysis methodology taking a confirmatory (e.g., hypothesis-testing) approach to the multivariate analysis of a structural theory embedded in some phenomenon (Diamantopoulos & Siguaw, 2007). This theory depicts "causal" processes generating observations on multiple variables (Bentler, 1988). The term SEM indicates two important characteristics: (1) the causal processes are illustrated by a set of structural equations, and (2) these structural relations can be pictorially modeled to show a clearer conceptualization of the theory being investigated (Kelloway, 1998). The set of structural equations (hypothesized model) can be statistically tested to determine if they are consistent with the data (Schumacker, 2004). If adequate evidence for goodness-of-fit is found, the model is said to support the plausibility of postulated relations among variables. If adequate evidence is not found, such postulated relations are not accepted (e.g., they are rejected) (Byrne, 2001).

There are differences between SEM and other older multivariate procedures (Fornell, 1982). The first difference is that SEM takes a confirmatory, not an exploratory, approach to data analysis in spite of the fact that the later can be applied (Diamantopoulos & Siguaw, 2007). By asking postulated relations among variables to be specified in advance, SEM implies analysis of data for inferential purposes (Schumacker, 2004). The second difference is that traditional multivariate procedures are not taking measurement errors into consideration while SEM makes favorable conditions for the estimation of these parameters (Byrne, 2001). Finally, traditional multivariate procedures are based on observed measurements while SEM is able to incorporate both unobserved and observed variables into a complete model (Byrne, 1998). It should be noted that exploratory factor analysis only utilizes observed variables (factors are not known *a priori*) and in the end generates factors (unobserved variables/constructs) where the corresponding observed variables are categorized (Peters and Enders, 2002).

The full latent variable model in SEM is able to allow researchers to specify the regression structure among the constructs (Hulland, Chow and Shunyin, 1996). In other words, the researcher could hypothesize one construct's impact on another construct under causal direction modeling. This full model consists of both a measurement model and a structural model in which the former depicts links between the constructs and their observed measures (indicators) and the latter illustrates links among the constructs themselves (Hulland, Chow and Shunyin, 1996). If the full model includes causal links from one direction only, it is named a recursive model. If the full model includes reciprocal or feedback effects, it is named a non-recursive model (Diamantopoulos & Siguaw, 2007).

It is typical that a researcher will postulate a statistical model on the grounds of his/her knowledge grounded in the relevant theory, relevant empirical research studies, or some combination of both. After the specification of the model, the researcher would then test the model's plausibility on the grounds of sample data comprising all observed variables (Muthen and Muthen, 2010). The main outcome of such model-testing procedure is to determine the goodness of fit between the hypothesized model and the sample data (Ping, 2002). Due to the fact that it is almost impossible to have a perfect fit between the observed data and the hypothesized model, discrepancy will exists and is the residual (Muthen and Muthen, 2010). The model-fitting process can be illustrated by the following equation (Bentler, 1995):

DATA = MODEL + RESIDUAL

where

DATA represents scores related to the observed variables derived from the sample.

MODEL represents the hypothesized structure linking the observed variables to the latent variables, and in some models, linking particular latent variables to one another.

RESIDUAL represents the discrepancy between the hypothesized model and the observed data.

It is worth noting that in SEM, MODEL represents the reproduced, or model-implied, covariance matrix and each element of MODEL is a function of unknown model parameters that need to be estimated by some method such as maximum likelihood. Such a model-implied covariance matrix is symmetric and has a total of $p \times (p + 1)/2$ non-redundant elements. This number of non-redundant elements will also be used to determine the degrees of freedom of a model under consideration.

DATA is the observed empirical covariance matrix that is obtained from the sample at hand for the observed variables under consideration.

RESIDUAL is the difference between each element of the model-implied covariance matrix (based on the estimates of the parameters) and its counterpart element in the observed empirical covariance matrix.

Based on the above explanation, all fit indices are based on RESIDUAL and of course they are functions of unknown model parameters that need to be estimated (Schumacker and Lomax, 2004). Table 1 below summarizes model fit criteria and acceptable fit interpretation.

Table 1: Model Fit Criteria and Acceptable Fit Interpretation
Adopted from Schumacker and Lomax (2004)

Model fit criteria	Acceptable level	Interpretation
Chi-square	Tabled λ^2 value	Compares obtained λ^2 value with tabled value for given df
Goodness-of-fit (GFI)	0 (no fit) to 1 (perfect fit)	Value close to .9 reflects a good fit
Adjusted GFI (AGFI)	0 (no fit) to 1 (perfect fit)	Value adjusted for df, with .9 a good model fit
Root-mean-square residual (RMR)	Researcher defines level	Indicates the closeness of $\sum$ to S matrix
Root-mean-square error of approximation (RMSEA)	<.05	Value less than .05 indicates a good model fit
Tucker-Lewis index	0 (no fit) to 1 (perfect fit)	Value close to .9 reflects a good model fit
Normed fit index	0 (no fit) to 1 (perfect fit)	Value close to .9 reflects a good model fit
Normed chi-square	1.0-5.0	Less than 1.0 is a poor model fit; more than 5.0 reflects a need for improvement
Parsimonious fit index	0 (no fit) to 1 (perfect fit)	Compares values in alternative models
Akaike information criterion	0 (perfect fit) to negative value (poor fit)	Compares values in alternative models

Application of SEM techniques involves the estimation of unknown parameters (e.g., factor loadings or path coefficients) based on observed covariances. In general, issues of identification deal with whether a unique solution for the model (or its component parameters) can be obtained (Bollen, 1989). Models and/or parameters may be under-identified, just-identified, or over-identified. A necessary, but insufficient, condition for the identification of a structural

equation model is that one cannot estimate more parameters than there are unique elements in the covariance matrix. Bollen (1989) refers to this as the t rule for model identification. Given a p × p covariance matrix (where p is the number of indicator or observed variables), there are p × (p + 1)/2 unique elements in the covariance matrix. Attempts to estimate exactly p × (p + 1)/2 identifiable parameters result in the just-identified or saturated model. Only one unique solution is obtained for the just-identified model, and the model always provides a perfect fit to the data (Medsker, Williams, & Holahan, 1994). When the number of unknown model parameters exceeds the number of unique elements in the indicator variable covariance matrix, the model is said to be under-identified. This is a problem because the model parameters cannot be uniquely ascertained; there is no unique solution. When the number of unique covariance matrix elements exceeds the number of unknown model parameters, the model is over-identified and the best-fitting solution may be unique with all parameters identifiable. The procedures to assess whether parameters of a proposed model are identifiable (uniquely estimable) are cumbersome and involve extensive calculation (Rigdon, 1996). However, when conducting SEM it is common practice to ensure that all proposed models are over-identified and so satisfy the necessary condition for parameter identification.

In closing, there is increased attention by editors and reviewers on methods and analysis of submitted manuscripts. In a recent edition of the *Journal of International Business Studies*, the editors suggested that manuscript authors pay particular attention to properly and thoroughly describing the relationships between constructs (Thomas et al., 2011). "…authors cannot assume that readers will somehow automatically understand how the constructs are related to or build on each other" (Thomas et al., 2011: 1074). It will be increasingly important for researchers to pay particular attention to measurement, research design, and analysis.

References

BENTLER, P.M. (1988) 'Practical issues in structural modeling' Sociological Methods & Research, Vol. 16, pp. 78 – 117.

BENTLER, P. (1995). EQS Structural Equations program Manual. Multivariate Software, Inc., Encino, CA.

BERTSCH, A. (2009) Exploring Perceptions of Values in U.S. Managers: Interstate Cross-Cultural Differences and Similarities within the U.S.A.. Henley-on-Thames, Henley Management College

BERTSCH, A. (2012a) Validating GLOBE's Societal Values Scales: A Test in the U.S.A., International Journal of Business and Social Science, Vol. 3 (8), April 2012, ISSN 2219-1933 (Print) ISSN 2219-6021 (Online)

BERTSCH, A. (2012b) The Melting Pot vs. the Salad Bowl: A Call to Explore Regional Cross-Cultural Differences and Similarities within the U.S.A., Journal of Organizational Culture, Communications and Conflict, in press.

BOLLEN, K.A. (1989) Structural Equations with Latent Variables. Wiley and Son, New York.

BYRNE, B.M. (1998) 'Structural equation modeling with Lisrel, Prelis, and Simplis: Basic concepts, applications, and programming', Lawrence Erlbaum Associates, London.

BYRNE, B.M. (2001) 'Structural equation modeling with Amos: Basic concepts, applications, and programming', Lawrence Erlbaum Associates, London.

CAVUSGIL, S. T. & DAS, A. (1997) Methodological Issues in Emperical Cross-cultural Research: A Survey of the Management Literature and a Framework. Management International Review, 37, 71-96.

CHURCHILL, G. A. (1979) A Paradigm for Developing Better Measures of Marketing Constructs. Journal of Marketing Research, 16, 64-73.

CHURCHILL, G. A. (1992) Basic Marketing Research, Orlando, The Dryden Press.

DE BARROS, B. T. (2002) Perceptions of values of Brazilian managers: Cross-cultural differences and similarities in Brazil. Henley-on-Thames, U.K., Henley Management College

DEN HARTOG, D. N. (2004) Assertiveness. IN HOUSE, D., HANGES, P. J., JAVIDAN, M., DORFMAN, P. and GUPTA, V. (Eds.) Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies. Thousand Oaks, CA, Sage.

DIAMANTOPOULOS, A.,& SIGUAW, J.A. (2007) 'Introducing Lisrel', Sage Publications, London.

EARLEY, P. C. (2006) Leading cultural research in the future: a matter of paradigms and taste. Journal of International Business Studies, 37, 922-931.

FIELD, A. (2005). Discovering statistics using SPSS. Sage, London.

FIELD, A. (2009) Discovering Statistics Using SPSS, 3rd, Thousand Oaks, CA, Sage Publications.

FORNELL, C. (1982) A second generation of multivariate analysis Vol. 1: Methods. New York: Praeger.

GELFAND, M. J., BHAWUK, D. P. S., NISHIII, L. H. & BECHTOLD, D. J. (2004) Individualism and Collectivism. IN HOUSE, D., HANGES, P. J., JAVIDAN, M., DORFMAN, P. and GUPTA, V. (Eds.) Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies. Thousand Oaks, CA, Sage.

GLOBE AUTHORS (2006) Guidelines for the Use of GLOBE Culture and Leadership Scales, [Online] Retrieved on: February 24, 2008 from www.thunderbird.edu/wwwfiles/ms/globe/pdf/globe_culture_and_leadership_scales_guidelines.pdf

GLOBE BETA QUESTIONNAIRE (2006) GLOBE Research Survey: Form Beta, [Online] Retrieved on: February 27, 2008, from http://www.thunderbird.edu/wwwfiles/ms/globe/instruments.asp

GLOBE QUESTIONNAIRE (2006) GLOBE Research Survey: Form Beta, [Online] Retrieved on: February 27, 2008, from http://www.thunderbird.edu/wwwfiles/ms/globe/instruments.asp

GRENNES, T. (1999) Perceptions of values and commitment of Norwegian managers. Henley-on-Thames, U.K., Henley Management College

GUPTA, V., SULLEY DE LUQUE, M. & HOUSE, R. J. (2004) Multisource Construct Validity of GLOBE Scales. IN HOUSE, R. G., HANGES, P. J., JAVIDAN, M., DORFMAN, P. and GUPTA, V. (Eds.) Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies. Thousand Oaks, CA, Sage.

HAIR, J. F., JR., BABIN, B., MONEY, A. H. & SAMOUEL, P. (2003) Essentials of Business Research Methods, New Jersey, Wiley.

HAIR, J. F., JR., BLACK, W. C., BABIN, B. J., ANDERSON, R. E. & TATHAM, R., L. (2006) Multivariate Data Analysis, 6th, Upper Saddle River, NJ, Pearson Prentice Hall.

HAIR, J. F., JR., BLACK, W. C., BABIN, B. J., & ANDERSON, R. E. (2010) Multivariate Data Analysis, 7th, Upper Saddle River, NJ, Pearson Prentice Hall.

HANGES, P. J. & DICKSON, M. W. (2004) Development and Validation of the Culture and Leadership Scales. IN HOUSE, R. J., HANGES, P. J., JAVIDAN, M., DORFMAN, P. and GUPTA, V. (Eds.) Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies. Thousand Oaks, CA, Sage.

HINKIN, T. (1998) A brief tutorial on the development of measures for use in survey questionnaires, Organizational Research Methods, 1, 104-111.

HOFSTEDE, G. (1967) The Game of Budget Control, Assen, Netherlands, London: Van Gorcum/Tavistock.

HOFSTEDE, G. (1980) Culture's Consequences: International Differences in Work-Related Values, London, Sage.

HOFSTEDE, G. (2001) Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations, London, Sage Publications.

HOFSTEDE, G. (2006) What did GLOBE really measure? Researchers' minds versus respondents' minds. Journal of International Business Studies, 37, 882-896.

HOPPE, M. H. (1990) A Comparative Study of Country Elites: International differences in work related values and learning and their implications for management training and development. Chapel Hill, NC, University of North Carolina

HOUSE, R. J., HANGES, P. J., JAVIDAN, M., DORFMAN, P. & GUPTA, V. (2004) Culture, Leadership and Organizations: The GLOBE Study of 62 Societies, Thousand Oaks, Sage.

HULLAND, J., CHOW, Y.H., SHUNYIN, L. (1996) 'Use of causal models in marketing research: a review' International Journal of Research in Marketing, Vol. 13, No. 2, pp. 181 – 197.

JAVIDAN, M., HOUSE, R. J., DORFMAN, P. W., HANGES, P. J. & DE LUQUET, M. S. (2006) Conceptualizing and measuring cultures and their consequences: a comparative review of GLOBE's and Hofstede's approaches. Journal of International Business Studies, 37, 897-914.

JAVIDAN, M. (2004) Performance Orientation. IN HOUSE, R. J., HANGES, P. J., JAVIDAN, M., DORFMAN, P. and GUPTA, V. (Eds.) Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies. Thousand Oaks, CA, Sage.

JAVIDAN, M., HOUSE, R. J., DORFMAN, P., GUPTA, V., HANGES, P. J. & SULLEY DE LUQUE, M. (2004) Conclusions and Future Directions. IN HOUSE, R. J., HANGES, P. J., JAVIDAN, M., DORFMAN, P. and GUPTA, V. (Eds.) Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies. Thousand Oaks, CA, Sage.

KELLOWAY, K.E. (1998) 'Using Lisrel for structural equation modeling: A researcher's guide', Sage Publications, London.

MALHOTRA, N. K. (2007) Marketing Research: An Applied Orientation, 5th ed., Upper Saddle River, NJ, Pearson Prentice Hall.

MEDSKER, G.J., WILLIAMS, L.J., & HOLAHAN, P.J. (1994) 'A review of current practices for evaluating causal models in organizational behavior and human resources management research', Journal of Management, Vol. 20, pp. 439-464.

MINKOV, M., & BLAGOEV, V. (2011) What do Project GLOBE's cultural dimensions reflect? An empirical perspective, Asia Pacific Business Review, DOI: 10.1080/13602381.2010.496292 available at http://dx.doi.org/10.1080/13602381.2010.496292

MUTHEN, L.K., & MUTHEN, B.O. (2010) 'Mplus – Statistical analysis with latent variables: User's guide', Sixth Edition, Los Angeles, CA.

PETERS, C.L.O., & ENDERS, C. (2002) 'A primer for the estimation of structural equation models in the presence of missing data: maximum likelihood algorithms' Journal of Targeting, Measurement and Analysis for Marketing, Vol. 11, No. 1, pp. 81 – 95.

PING, R.A. (2002). Interpreting latent variable interactions. American Marketing Association (Winter) Educators' Conference Proceedings, Austin, TX, February 22 – 25, 213 – 220.

RAMSEY, F. & SCHAFER, D. (2002) The Statistical Sleuth, Thomson Learning, Pacific Grove, CA.

RIGDON, E.E. (1996) 'CFI versus RMSEA: A comparative of two fit indexes for structural equation modeling' Structural Equation Modeling, Vol. 3, 369 – 379.

SCHUMACKER, R.E., & LOMAX, R.G. (2004) 'A Beginner's guide to structural equation modeling', Lawrence Erlbaum Associates, London.

SCHWAB, D. P. (2005) 'Research methods for organizational studies', Lawrence Erlbaum Associates, London.

THOMAS, D.C., CUERVO-CAZURRA, A., BRANNEN, M. Y., (2011) From the Editors: Explaining theoretical relationships in international business research: Focusing on the arrows, NOT the boxes, Journal of International Business Studies, 42, 1073-1078.

WRENN, B. (1997) The market orientation construct: measurement and scaling issues. Journal of Marketing Theory and Practice, 5(3), 31-54.

ZIKMUND, A. G. & BABIN, B. J. (2007) Exploring Marketing Research, 9th ed., Mason, OH, Thomson South-western.

Examining the Impact of Social Intelligence, Demographics, and Context for Implementing the Dynamics of the Situational Leadership Model

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Abstract

We focus on factors that may impact the implementation of Hersey and Blanchard's Situational Leadership Theory (SLT). Four are examined: (1) social perceptiveness - an accurate awareness of situational demands, (2) behavioral flexibility - appropriate responses to these demands, (3) individual characteristics such as education and age and their potential impact on leader ratings on follower development level, and (4) span of supervision, which implies the larger the number of followers, the greater the difficulty for leaders to accurately assess follower competence and commitment. The study population was drawn from 437 respondents working in Norwegian financial organizations. Results of linear regression analysis indicate leaders who

are more socially aware are better able to rate follower competence and commitment than leaders who are less aware. Results of omnibus testing support the contention that leaders who are more socially flexible are better able to match leadership style to follower competence and commitment than leaders who are less flexible. Support was obtained for the significance of age for implementation of SLT, as older superiors are better able to rate follower competence and commitment than younger superiors. Finally, in small groups leaders are better able to rate follower competence and commitment than leaders in larger groups. The evidence suggests other factors may influence leaders' ability to apply SLT, and these factors should be taken into consideration when testing the validity of the theory.

Keywords: situational leadership, social perceptiveness, behavioral flexibility, demographics, span of supervision

Introduction

Situational leadership theory (SLT) has undergone a number of cosmetic and substantive changes since it was first introduced in 1969 as the "Life Cycle of Leadership" (Hersey and Blanchard, 1969). In the 1977 presentation of SLT, Hersey and Blanchard provided the most explicit description of the theoretical foundations for the original version of their model (Hersey and Blanchard, 1996). In 1985 Blanchard introduced a second version of SLT which has since undergone several revisions (e.g., Blanchard, 1988; Blanchard et al., 1985; Blanchard et al., 1993) and recently in 2007 (Blanchard, 2007). A significant difference between the original model and the second version of SLT was the modification of the three-way interaction between directive and supportive leader behavior and follower development level (Blanchard 2007; 2010). For example, originally SLT stated that followers low on competence and low on commitment should benefit from directive behavior, but the latest version of SLT predicts followers low on competence but high on commitment benefit from directing behavior (low leader consideration combined with high leader structuring). For other levels of competence and commitment, the second version of SLT suggests that followers low on competence to having some competence in combination with low commitment, benefit from coaching behavior (high leader consideration combined with high leader structuring). Followers who are moderate to high on competence but have variable commitment benefit from supportive behavior (high leader consideration combined with low leader structuring), and finally followers high on both competence and commitment benefit from delegating behavior (low

leader consideration combined with low leader structuring). Assessment of follower competence and commitment, which is a critical contextual feature in dictating an optimal leadership style, is an integral component of SLT (Blanchard, 2010), implying that both leader and follower should assess competence and commitment separately and then attempt to come to some agreement.

Despite its inherent intuitive appeal and several revisions, it has proven exceedingly difficult to verify the principles of SLT. The theory has been tested several times and has compiled a mixed record of support (Thompson and Vecchio, 2009). Judged in their totality there is some evidence to support the theory's prescriptions for dealing with followers at low development level with greater directiveness, and then substituting directiveness with supportiveness as follower competence increases (Vecchio, 1987; Norris and Vecchio, 1992; Fernandez and Vecchio, 1997; Vecchio et al., 2006; Thompson and Vecchio, 2009). Context, instrumentation and/or research design applied in the studies on SLT may have limited the obtainment of evidence in support of SLT. For example, previous studies have used follower self-report when assessing competence and commitment. Numerous research has found self-report to be inflated, unreliable, invalid, biased and inaccurate (Yammarino and Atwater, 1993; Schriesheim et al., 2011). Leaders may be inclined to make assumptions about one attribute based on judgments about other attributes - for example, a competent follower may also be assumed to be committed (Thompson, 2008). However, the results may also reflect a need for an alternative approach to examining the theory. No study has examined leader ability to implement the dynamics of SLT. More specifically, it is unknown what influences leader ability to understand the social setting (follower development level) and respond to the dynamics of this setting (matching leader style to follower development level). A number of factors may influence leader ability to apply SLT.

Literature review

Many authors (Zaccaro et al., 1991; Mumford et al., 2000; Connelly et al., 2000; Zaccaro, 2007) suggest in their studies on social intelligence that effective leaders have a degree of social intelligence that results in accurate perception of social requirements and the selection of appropriate behavioral responses. High social intelligence is vital for interpretation of social problems and for implementation of effective solutions. More specifically, effective leaders need two social attributes: (1) social perceptiveness, which promotes an accurate awareness of

situational demands, and (2) behavioral flexibility, which facilitates appropriate responses to these demands. Social perceptiveness refers to leader capacity to be aware of and sensitive to the needs, goals, demands, and problems at multiple system levels, including individual members, and relationships among members. Furthermore, social perceptiveness is orientated towards personnel dynamics that may be relevant to implementation of planned action, such as follower ability and capabilities. Leaders who are socially perceptive will for the most part be quicker in perceiving and understanding follower competence and commitment. More specifically, leaders who are more socially aware will be better able to rate follower competence and commitment than leaders who are less aware. Thus leaders who are more socially aware will experience lower discrepancies between their evaluations of follower competence and commitment, and follower self-evaluations of competence and commitment, than leaders who are less aware.

> ***Hypothesis 1****: Leaders who are more socially aware are better able to rate follower competence and commitment (as suggested by SLT) than leaders who are less aware.*

Behavioral flexibility refers to leader ability to respond to different situational requirements. This ability dimension of behavioral flexibility requires a response repertoire which allows for a correct response to situational demands. Besides ability, willingness is a second dimension of behavior flexibility, which refers to leader desire to vary responses according to situational requirements. Simple awareness of a large repertoire of possible behaviors does not mean a leader will employ all or even a substantial subset of those behaviors (Thompson and Li, 2010). A leader who does not perceive distinct situational differences may respond in the usual manner regardless of the situation. Other leaders may recognize the need for certain behaviors, have the ability to execute the necessary behaviors, and believe they can execute these behaviors successfully, but still decide not to do so either because they do not care, do not see enough personal gain, do not want to hurt other people, or for other reasons of their own. Leader responses are task specific and situation driven. To behave flexibly, leaders need a response repertoire and ability to select the correct response for particular situational demands. Thus leaders who are more socially flexible are better able to match their leadership style (combination of directive and supportive behavior) to the development level of followers (combination of competence and commitment) than leaders who are less flexible.

***Hypothesis 2**: Leaders who are more socially flexible are better able to match leadership style to follower competence and commitment as suggested by SLT than leaders who are less flexible.*

Social perceptiveness and behavioral flexibility represent key social skills, laying a foundation for effective leadership by providing leaders with the capability to understand the social setting and respond to the dynamics of this setting. However, no study has investigated the significance of social perceptiveness and behavioral flexibility when implementing SLT, and it is germane to ask whether implementation of SLT is dependent on the social intelligence of leaders.

Previous research has not investigated determinants of rating incongruence in connection to SLT. However, self-other rating agreement (SOA) research has investigated the relative importance of a number of biographic variables and their interaction with self-other agreement. Below are outlined two demographic factors and their potential impact on leader ratings on follower development level.

Education level

Rating congruence provides the basis for selecting optimal leadership style, implying that both leader and follower should assess competence and commitment separately and then attempt to come to some agreement (Blanchard, 2010). SOA research supports the contention that a number of variables influence self-other agreement, like individual characteristics such as rater education level (Vecchio and Anderson, 2009; Fleenor et al., 2010). Generally, it is reasonable to assume that individuals with higher degrees of analytic and cognitive ability, which correlate with education, are better able to process more information with greater accuracy (Yammarino and Atwater, 1997; Ostroff et al., 2004). This would yield more accurate ratings of others. Thus, leaders with more education may be better able to rate follower competence and commitment than leaders who have less education and will experience lower discrepancies between their evaluations of follower competence and commitment and follower self-evaluations of competence and commitment.

***Hypothesis 3**: Leaders with more education are better able to rate follower competence and commitment as suggested in SLT than leaders who have less education.*

Age

Individual characteristics such as age can also influence perceptions of others (Yammarino and Atwater, 1997; Fleenor et al., 2010). It may be that older superiors have greater experience, which is presumed to be an asset, as well as a maturational dynamic beneficial for assessment of follower development level. The mechanism underlying this process may be that superior age and experience translates into better judgment of follower competence and commitment, and that older superiors experience lower discrepancies in rating of followers than younger superiors.

> ***Hypothesis 4****: Older superiors are better able to rate follower competence and commitment than younger superiors.*

Other variables may also affect leader ability to implement the dynamics of SLT, like context or situational factors influencing rating by the superior. Contextual factors are linked to job context or organizational situation, such as span of supervision, job pressures, political processes, organizational position, prior rating experiences, etc. (Yammarino and Atwater, 1997; Ostroff et al., 2004).

Span of supervision

Contextual factors may influence the way superiors rate followers, resulting in incongruence between superior ratings of follower development level and follower self-rating. Leaders with larger numbers of followers may experience problems making precise assessments of follower competence and commitment. It may be that the larger the number of direct reports, the larger the gap between leader assessment of follower development level and follower self-assessment of development level. The reason for this assumption is that opportunities for interaction between leader and individual followers are less likely, and may limit the possibilities for precise assessment of follower development level. Thus we will investigate the influence of span of supervision on rating by superior of follower competence and commitment.

> ***Hypothesis 5****: In small groups leaders are better able to rate follower competence and commitment as suggested in SLT than leaders in larger groups.*

Method

Setting and sample

Data were collected from 80 supervisors and 357 followers from 10 Norwegian financial institutions. Leaders and their followers at different organizational levels (top, middle, and operational) contributed data. The selection of the study population from different levels was done because we have little knowledge about the distribution of match/mismatch in organizations. If "mismatching" is widely distributed, the possibility for testing SLT in field settings becomes problematic. Furthermore, examination of the model demands a large sample that includes full ranges of job experience. Large sample sizes must be obtained in order to capture the hypothesized range of situations and conduct statistically powerful tests of the theory. This study population of 437 respondents is the second largest number of leaders to be examined in an empirical test of SLT. Response rate was nearly 91.6% based on 477 contacted individuals. Questionnaires were distributed to the leaders and followers while at work. The leaders and the followers were predominantly males (55% and 56%, respectively). The respondents also provided demographic information on education as well as age. The average age of the leaders was 44.6 years, with an average education of 15.5 years. Follower average age and education was 44.3 and 14.2 years, respectively.

Measures

Supervisor assessments

Each supervisor completed a packet that contained the following instruments: assessment of follower development level on a modified 10-item Employee Readiness Scale (Fernandez and Vecchio, 1997) (sample items for competence: "Knowledge of the subject area," sample items for commitment: "Willingness to take responsibility," anchors: 1 = Low, 7 = High). Leader self-rating of social perceptiveness was measured with a nine-item scale taken from the TEIQue instrument (Petrides and Furnham, 2003) (sample item: "Understanding the needs and desires of others is not a problem for me," anchors: 1 = Completely Disagree, 7 = Completely Agree). Leader self-rating of behavioral flexibility was measured with an eight-item scale taken from the TEIQue instrument (Petrides and Furnham, 2003) (sample item: "Generally, I'm able to adapt to new environments").

Subordinate assessments

Each subordinate provided ratings for each supervisor on the following scales: LBDQ-XII

(Stogdill et al., 1963) was used for measuring supervisor considerateness and structuring. Leader consideration was measured with a four-item scale composed of items taken from the LBDQ-XII instrument (sample item: "My supervisor's relations with me can be described as friendly and approachable," anchors: 1 = Never, 2 = Seldom, 3 = Occasionally, 4 = Often, 5 = Always). Leader structuring was measured with four items taken from the LBDQ-XII, using the same 5-point response scale for each item (sample items: "My supervisor schedules for me the work to be done"). Subordinate self-assessment of development level was measured on a modified 10-item Employee Readiness Scale (Fernandez and Vecchio, 1997) (sample items for competence: Knowledge of the subject area; sample items for commitment: Willingness to take responsibility, anchors: 1 = Low, 7 = High).

Translation and pilot test

The original questionnaires to be used in this study were developed in English. Even though respondents are expected to have good knowledge of English, the questionnaire was translated into Norwegian to avoid the risk of misunderstanding or misconception. The questionnaires were put through a translation-back translation conversion process. Translation-back translation was used to ensure equivalence of item meaning (Brislin et al., 1973; Cavusgil and Das, 1997). After the translation was completed, it was field-tested to ensure respondents comprehended all questions. A pilot study further tested the instruments, distribution of questionnaires, and data collection procedure. Pre-testing of the questionnaire was undertaken before it was finally administrated in order to detect possible shortcomings in the design and administration of the questionnaire. Finally a focus group of five supervisors participated in pilot test of the instruments and concluded that the instruments were relevant to an industrial setting.

Analysis and results

Table 1 provides descriptive statistics and intercorrelations among independent and dependent variables. The coefficient alpha estimates for the multi-item scales are listed on the primary diagonal of the intercorrelation matrix. The alpha coefficients were in an acceptable range for all the variables of interest. Social perceptiveness was significantly correlated with education, span of supervision and leader rating of follower development level. Furthermore, behavioral flexibility correlated with age, education, span of supervision, leader rating of follower development level, and follower self-rating of development level. Finally, age and education correlated with leader rating of follower development level.

Table 1
Means, Standard Deviations, Reliabilities, and Intercorrelations

	M	SD	1	2	3	4	5	6	7	8	9
Social perceptiveness	47.25	6.14	(0.65)								
Behavioral flexibility	37.10	4.75	0.52**	(0.61)							
Consideration	3.96	.64	0.04	-0.04	(0.77)						
Structuring	3.67	.70	-0.10*	-0.02	0.36**	(0.84)					
Age	44.61	6.36	0.00	0.17**	0.07	-0.06	(-)				
Education (years)	14.21	2.44	0.13*	0.23**	-0.06	-0.02	0.17**	(-)			
Span of supervision	7.16	4.26	-0.13*	-0.10*	-0.13*	0.06	-0.30**	-0.01	(-)		
Supervisor rating of follower development level	12.76	2.08	0.11*	0.17**	0.27**	0.04	0.24**	0.14**	-0.23**	(0.91)	
Follower self-rating of follower development level	13.64	1.34	0.03	0.15**	0.17**	0.17**	0.09	0.01	-0.03	0.22**	(0.81)

N ≤ 357. Cronbach alphas on primary diagonal; * p < .05; ** p < .01.

Social perceptiveness

Hypothesis 1 predicts that leaders who are more socially aware will be better able to rate follower competence and commitment as suggested in SLT than leaders who are less aware. Linear regression was applied to test the hypothesis (Aiken and West, 1991; Tabachnick and Fidel, 2007). Table 2 summarizes the results of these analyses for the dependent variable difference in rating of follower competence and commitment. Significant results were obtained in support of the prediction of an inverse relationship between leader social perceptiveness and difference in leader rating of follower competence and commitment and follower self-rating of competence and commitment.

Table 2
Summary of Linear Regression Analyses. Test of the Relationship between Social Awareness and Difference in Rating of Follower Development Level

Dependent variable: Difference in Rating of follower competence

Predictor	**beta**	**R^2**
Social awareness	-.10*	.01

+ $p < .10$; * $p < .05$; ** $p < .01$.

Dependent variable: Difference in Rating of follower commitment

Predictor	**beta**	**R^2**
Social awareness	-.12*	.01

+ $p < .10$; * $p < .05$; ** $p < .01$.

Behavioral flexibility

Hypothesis 2 assumes leaders who are more socially flexible will be better able to match leadership style to follower competence and commitment as suggested in SLT than leaders who are less flexible. SLT principles suggest that for followers at low competence level, effective leadership calls for high directive behavior. As followers gain more competence, the need for directive behavior will be reduced and then subside as followers achieve a higher level of development. Hence, cases were identified as representing the four development levels in accord with the terms used by Blanchard (2007, 2010). Then matches were identified within each level by identifying proper combinations of leader structuring and leader consideration. Matches were then contrasted with mismatches across all development levels. The use of the SLT II classification system for defining categories of developmental level meant that 213 of 357 cases were not potentially classifiable, as they did not fall into specified subsets of the two-dimensional space mapped by the detailed combinations of competence and commitment. More specifically, follower self-assessment of competence was quartized at the sample value of 6.2, 6.8, and 7.2, and follower self-assessment of commitment was trichotomized at the sample value of 6.8 and 7.4. For the leader behavior dimension, four levels of structuring were quartized at the sample value of 3.25, 3.75, and 4.25, and consideration was dichotomized at

the sample median value of 4. Omnibus tests provided for direct comparison of results across conditions, and were applied in order to have an adequate sample size for conducting the necessary statistical tests across the cells.

The result of the omnibus test is presented in Table 3 and provides support for hypothesis 2 in that level of mean match cases significantly exceeded the mean of mismatched cases.

Table 3
Results of Omnibus Test: Comparisons of Matched Cases with Mismatched Cases

Group	M	SD	N	T
Match	40.20	2.38	5	2.09+
Mismatch	37.45	4.46	35	

+ $p < .10$; * $p < .05$; ** $p < .01$.

Education

Hypothesis 3 predicts that leaders with more education may be better able to rate follower competence and commitment as suggested in SLT than leaders who have less education. Linear regression was applied to examine whether there was an inverse relationship between leader education level and difference in leader rating of follower competence and commitment and follower self-rating of competence and commitment. The results are presented in Table 4 and show no support for the hypothesis.

Table 4
Summary of Linear Regression Analyses. Test of the Relationship between Leader Education and Difference in Rating of Follower Development Level

Dependent variable: Difference in Rating of follower competence

Predictor	**beta**	**R^2**
Leader education	-.01	.00

+ $p < .10$; * $p < .05$; ** $p < .01$.

Dependent variable: Difference in Rating of follower commitment

Predictor	**beta**	**R^2**
Leader education	-.01	.00

+ $p < .10$; * $p < .05$; ** $p < .01$.

However, an additional analysis was conducted for leaders with 5 years education and more at university level, which corresponds to a master's or doctoral level. The linear regression analysis is presented in Table 5 and reveals significant results for leaders with a higher education.

Table 5
Summary of Linear Regression Analyses. Test of the Relationship between Leader with Higher Education and Difference in Rating of Follower Development Level

Dependent variable: Difference in Rating of follower competence

Predictor	**beta**	**R^2**
Leader education	-.15+	.02

+ $p < .10$; * $p < .05$; ** $p < .01$.

Dependent variable: Difference in Rating of follower commitment

Predictors	**beta**	**R^2**
Leader education	-.19*	.03

+ $p < .10$; * $p < .05$; ** $p < .01$.

Age

Hypothesis 4 predicts that older superiors will be better able to rate follower competence and commitment than younger superiors. Linear regression was applied to examine whether there was an inverse relationship between age and difference in leader rating of follower competence and commitment and follower self-rating of competence and commitment. Table 6 shows significant results were obtained for the independent variable age.

Table 6
Summary of Linear Regression Analyses. Test of the Relationship between Leader Age and Difference in Rating of Follower Development Level

Dependent variable: Difference in Rating of follower competence

Predictor	**beta**	**R^2**
Leader age	-.17**	.03

+ $p < .10$; * $p < .05$; ** $p < .01$.

Dependent variable: Difference in Rating of follower commitment

Predictors	**beta**	**R^2**
Leader age	-.17**	.03

+ $p < .10$; * $p < .05$; ** $p < .01$.

Span of supervision

Hypothesis 5 predicts that in small groups leaders will be better able to rate follower competence and commitment as suggested in SLT than leaders in larger groups. The span of supervision in the present sample consists of groups varying from 2 to 18 direct reports, with 6 followers in a group as median. Linear regression was applied to examine the relationship between span of supervision and difference in leader rating of follower competence and commitment and follower self-rating of competence and commitment. Table 7 outlines the results of the analysis. Significant results indicate that rating incongruence between leader and follower assessment of follower development level increases with larger groups.

Table 7
Summary of Linear Regression Analyses. Test of the Relationship between Span of Supervision and Difference in Rating of Follower Development Level

Dependent variable: Difference in Rating of follower competence

Predictor	beta	R^2
Span of supervision	.19**	.03

+ $p < .10$; * $p < .05$; ** $p < .01$.

Dependent variable: Difference in Rating of follower commitment

Predictor	beta	R^2
Span of supervision	.17**	.03

+ $p < .10$; * $p < .05$; ** $p < .01$.

Discussion

Over the last 25 years various attempts have been made to empirically validate SLT's predicted three-way interaction. There have been six empirical studies to fully test this three-way interaction (leader directiveness, leader supportiveness and follower development level interact in determining outcomes such as performance and affective response). While these studies show some progress has been made in testing the validity of SLT, clearly additional work is needed to highlight the strengths and shortcomings of this theory. In this study we extended the work by examining a number of background and context antecedents that may influence leader ability to implement the dynamics of SLT. The present study represents the first attempt, using omnibus testing and multivariate regression that allows for determining the influence of the antecedents for implementing SLT. It is therefore not possible to contrast these findings with those obtained in other investigations. However, several interesting patterns were identified concerning social intelligence. Significant results were obtained in support of the prediction of an inverse relationship between leader social perceptiveness and difference in rating of follower competence and commitment. Leaders who are more socially aware are better able to rate follower competence and commitment than leaders who are less aware. This is important

evidence given that rating congruence provides the basis for selecting optimal leadership style. Partnering for performance is an integral component of SLT, where both leader and follower need to come to some agreement on the determination of follower development level (Blanchard, 2010). If the rating of development level is based on some agreement, then it is assumed that the leader can provide the follower with an appropriate amount of direction and support. The results of this study have contributed to the understanding of what factors are related to leader-follower agreement.

Furthermore, the result of the omnibus test display support for the prediction that leaders who are more socially flexible are better able to match leadership style to follower competence and commitment as suggested in SLT than leaders who are less flexible, in that the level of mean match cases significantly exceeded the mean of mismatched cases. This evidence is significant because behavioral flexibility is an integral component of SLT Blanchard (2010), which proposes a taxonomy consisting of four leadership styles ranging from directing to delegating, and a framework for matching each style to different situations. Leaders who are low on behavior flexibility may have difficulty tailoring leadership style to follower development level, and instead use an intermediate leadership style with all followers. In some situations leaders may over-supervise, in other situations under-supervise. When leaders over-supervise, followers become frustrated. When leaders under-supervise, they usually do not obtain the desired results (Hersey and Blanchard, 1996).

For biographic variables and their interaction with self-other agreement, the results were mixed. No support was obtained for the prediction that leaders with more education may be better able to rate follower competence and commitment as suggested in SLT than leaders who have less education. However, for leaders with a higher education some support was obtained, implying that individuals with a greater degree of analytic and cognitive ability may be better able to process information, perhaps by making a more precise assessment of follower development level (Kingston et al., 2003). Also, Ostroff et al. (2004) found that those with more education were in greater agreement with others when self and others' ratings were compared, which is consistent with the findings in this study. For the second biographic variable - age - support was obtained for the notion that older superiors are better able to rate follower competence and commitment as suggested in SLT than younger superiors. Older leaders with many years of experience may, on the average, be more aware of follower potential, and how to develop their

skills and confidence, than more recently hired individuals. Previous studies on age have found that older managers as compared to younger managers tend to over-rate their effectiveness (Vecchio and Anderson, 2009). In this study we extended previous work by examining how manager age influences ratings of followers.

Significant results were obtained for the prediction that in groups with a large number of direct reports, discrepant assessment between leader rating of follower development level and follower self-rating of development level will occur. The evidence suggests that in smaller groups leaders will experience less rating discrepancies. This result is consistent with the study by Schriesheim et al., (2000), who state that interaction between leader and individual followers is less in large groups, which limits precise assessment of follower development level. However, the result contradicts findings by Ostroff et al. (2004), who concluded that contextual variables, like span of supervision, may be of less importance in understanding self-other agreement than demographic variables.

Implications

What do these results mean for implementing SLT? Evidence suggests that in small groups, leader and follower experience fewer rating discrepancies. The basic issue in the design of group size concerns how large a group should actually be. How many should report to each manager? The issue is not a simple one. Direct supervision is only one factor among many in deciding unit size. For example, the greater the use of standardization for coordination, the larger the size the work unit may be (Mintzberg, 1992). However, when discussing span of supervision in connection to SLT, we need to keep in mind of the dynamics of SLT itself, which focuses on the dyad, the basic unit of human interaction, and emphasizes learning reinforcement skills. Furthermore, situational leadership means it is essential to treat individual subordinates according to the dynamics of the situation, and that we be aware of opportunities to build subordinate skills and confidence (Thompson, 2008). However, in large groups leaders may find opportunities for interaction less likely, and may experience problems making precise assessments of follower competence and commitment because they have more constraints on their time than do supervisors of smaller groups. This important contingency antecedent of SLT has been identified in this study.

A second implication of this research is how to orchestrate leadership training processes.

Evidence suggests social intelligence is an important antecedent to leader-follower agreement. Hence, leaders would probably profit from developing attributes like social perceptiveness, which allows an accurate awareness of situational demands and behavioral flexibility. Such attributes promote appropriate situational responses. Leadership training programs should therefore focus on improvement of interpersonal skills (sensitivity to others' feelings and needs), and develop leader adaptive skills (ability to adapt and respond to various situational requirements). This may be a more suitable approach to developing leadership skills than traditional leadership courses, where the efficacy of such programs is questioned (Yukl, 2010).

Limitations and future research

The data for this study was collected from a single sector, the finance industry, to control or eliminate alternative sources of error variance. Mixing samples from different types of organization can create problems when combining results across firms. Results that look significant can be an artificial creation of the unique combination of across-firm data (Hair et al., 2010). However, the data here collected from only one industry may limit the generalizability of the research from this sample of leaders to other settings and other nations. Future research should therefore compare data from other business settings and the public sector.

Another limitation perhaps is the whole concept of development level in SLT. Blanchard (2010) proposes that follower development level is connected to a specific task. That is, followers may be competent performing one facet of a job and less competent performing a different facet of the same job. Researchers have commonly extended this principle to the level of an entire job, as has been done in this study (Thompson and Vecchio, 2009; Vecchio et al., 2006).

Finally, the discussion above of the rating process in connection to the implementation of SLT highlights the need for more research of potential mediator variables. Ostroff et al. (2004) suggest personality-type traits like self-esteem and self-confidence are important antecedent mediators for self-other agreement. Furthermore, although some background and context variables were investigated in this study, additional factors may be relevant. Job pressures, political processes, organizational position, prior rating experiences, organizational culture, etc., are contextual variables that may influence superiors' assessments of their followers.

Future research is needed to address whether the results found in this study hold for various contextual settings.

References

Aiken, L.S. and West, S.G. (1991), *Multiple regression: Testing and interpreting interactions*, Sage, Newbury Park, CA.

Atwater, L.E. and Yammarino, F. J. (1997), "Self-other rating agreement", in Ferris, G.R. (Ed.), *Research in personnel and human resources management*, JAI Press, pp. 121-174.

Atwater, L.E., Waldman, D., Ostroff, C., Robie, C. and Johnson, K.M. (2005), "Self-other agreement: Comparing its relationship with performance in the U.S. and Europe", *International Journal of Selection and Assessment,* Vol. 13, pp. 25-40.

Atwater, L.E., Wang, M., Smither, J.W. and Fleenor, J.W. (2009), "Are cultural characteristics associated with the relationship between self-others' ratings of leadership?", *Journal of Applied Leadership*, Vol. 94, pp. 141-164.

Blanchard, K. (1988), *Situational leadership II*, Blanchard Training and Development.

Blanchard, K.H. (2007), *Leading at a higher level*, Prentice-Hall, Upper Saddle River, NJ.

Blanchard, K H. (2008), "Situational leadership. Adapt your style to their development level", *Leadership Excellence*, Vol. 25 No. 5.

Blank, W., Weitzel, R. and Green, S.G. (1990), "A test of situational leadership theory", *Personnel Psychology*, Vol. 43, pp. 579-597.

Brislin, R., Lonner, W. and Thorndike, R. (1973), *Cross-cultural Research Methods*, Wiley, New York.

Cavusgil, S.T. and Das, A. (1997), "Methodological issues in empirical cross-cultural research: A survey of management literature and a framework", *Management International Review*, Vol. 37, pp. 71-96.

Connelly, M.S., Gilbert, J.A., Zaccaro, S.J., Threfall, K.V., Marks, M.A. and Mumford, M.D. (2000), "Exploring the relationship of leadership skill and knowledge to leader performance", *Leadership Quarterly*, Vol. 11 No. 1.

Darr, W. and Catano, V.M. (2008), "Multisource Assessments of Behavioral Competence and Selection Interview Performance", *International Journal of Selection and Assessment*, Vol. 16, pp. 68–72.

de Vries, R.E., Roe, R.A. and Taillieu, T.C.B. (1998), "Need for supervision: Its impact on leadership effectiveness", *Journal of Applied Behavioral Science*, Vol. 34, pp. 486-501.

Deniz, S.O., Viswesvaran, C. and Schmidt, F.L. (2008), "No New Terrain: Reliability and Construct Validity of Job Performance Ratings", *Industrial and Organizational Psychology*, Vol. 1, pp. 174–179.

Fernandez, C.F. and Vecchio, R.P. (1997), "Situational leadership theory revisited: A test of an across-jobs perspective", *Leadership Quarterly*, Vol. 8, pp. 67-84.

Fleenor, J.W., Smither, J.W., Atwater, L.E., Braddy, P.W. and Sturm R.E. (2010), "Self-other rating agreement in leadership: A review", *Leadership Quarterly*, Vol. 21, pp. 1005-1034.

Franklin, T. (2009), "Situational leadership: An analysis of public school teachers' readiness levels and preferred principal leadership style", *Humanities and Social Sciences*, Vol. 70 (1-A).

Heidemeier, H. and Moser, K. (2009), "Self-other agreement in job performance ratings: A meta-analytic test of a process model", *Journal of Applied Psychology*, Vol. 94, pp. 353-370.

Hersey, P. and Blanchard, K. (1996), "Great ideas", *Training and Development*, January, pp. 42-47.

House, R.J. (1996), "Path-goal theory of leadership: Lessons, legacy, and a reformulated Theory", *Leadership Quarterly*, Vol. 7 No. 3, pp. 323-352.

Kwan, V.S.Y., Johan, O.P., Robins, R.W. and Kuang, L.L. (2008), "Conceptualizing and assessing self-enhancement bias: A componential approach", *Journal of Personality and Social Psychology*, Vol. 94, pp. 1062-1077.

Mintzberg, H. (1992), *Structure in fives*. *Designing effective organizations,* Prentice-Hall International.

Mumford, M.D., Zaccaro, S.J., Harding, F.D., Jacobs, T.O. and Fleishman, E.A. (2000), "Leadership skills for a changing world: Solving complex social problems", *Leadership Quarterly*, Vol. 11 No. 1, pp. 11-35.

Murphy, K.R. (2008), "Perspectives on the relationship between job performance and ratings of job performance", *Industrial and Organizational Psychology,* Vol. 1, pp. 197–205.

Nachmais, C.F. and Nachmais, D. (1992), *Research Methods in the Social Sciences*, St. Martin's Press, New York.

Norris, W.R. and Vecchio, R.P. (1992), "Situational leadership theory: A replication", *Group and Organizational Management*, Vol. 17, pp. 331-342.

Ostroff, C., Atwater, L.E. and Feinberg, B.J. (2004), "Understanding self-other agreement: A look at rater and rate characteristics, context, and outcomes", *Personnel Psychology*, Vol. 57, pp. 333-375.

Petrides, K.V., Frederickson, N. and Furnham, A. (2004), "The role of trait emotional intelligence in academic performance and deviant behavior at school", *Personality and Individual Differences,* Vol. 36, pp. 277-293.

Petrides, K.V., Pe´rez-Gonza´lez, J. C. and Furnham, A. (2007), "On the criterion and incremental validity of trait emotional intelligence", *Cognition & Emotion*, Vol. 21 No. 1, pp. 26-55.

Schriesheim, C.A., Castro, S.L. and Yammarino, F.J. (2000), "Investigating contingencies: An examination of the impact of span of supervision and upward controllingness on leader-member exchange using traditional and multivariate within- and between-entities analysis", *Journal of Applied Psychology*, Vol. 85 No. 5, pp. 659-667.

Schriesheim, C.A., Joshua, B., Wu, J.B. and Cooper, C.D. (2011), "A two-study investigation of item wording effects on leader–follower convergence in descriptions of the leader–

member exchange (LMX) relationship", *Leadership Quarterly*, Vol. 22 No. 5, pp. 881-892.

Schyns, B., Maslyn, J.M. and Weibler, J. (2010), "Understanding the relationship between span of control and subordinate consensus in leader–member exchange", *European Journal of work and Organizational Psychology*, Vol. 19 No. 3, pp. 388–406.

Stogdill, R., Goode, O.S. and Day, D.R. (1963), "The leader behavior of corporation Presidents", *Personnel Psychology*, Vol. 16, pp. 127-132.

Tabachnick, B.G. and Fidel, L.S. (2007), "*Using multivariate statistics",* (5th edn). Boston: Pearson Education.

Thompson, G. (2008), "Situational Leadership Theory in a Norwegian context", Doctoral Dissertation, Brunel University, UK.

Thompson, G. (in press). *Self-other agreement. A necessary premise in situational leadership theory.*

Thompson, G. and Li, J. Z. (2010), *Leadership. In search of effective influence strategies*, Gyldendal Akademisk, Norway.

Thompson, G. and Vecchio, R.P. (2009), "Situational leadership theory: A test of three versions", *Leadership Quarterly*, Vol. 20, pp. 837-848.

Vecchio, R.P. (1987), "Situational leadership theory: An examination of a prescriptive theory", *Journal of Applied Psychology*, Vol. 72, pp. 444-451.

Vecchio, R.P. and Boatwright, K.J. (2002), "Preferences for idealized style and supervision", *Leadership Quarterly*, Vol. 13, pp. 327-342.

Vecchio, R.P., Bullis, R.G. and Brazil, D.M. (2006), "The utility of situational leadership theory: A replication in a military setting", *Small Group Research*, Vol. 37, pp. 407-424.

Vecchio, R.P. and Anderson, R.J. (2009), "Agreement in self-other ratings of leader effectiveness: The role of demographics and personality", *International Journal of Selection and Assessment,* Vol. 17, pp. 165-179.

Vecchio, R.P., Justin, J.E. and Pearce, C.L. (2010), "Empowering leadership: An examination of mediating mechanisms within a hierarchical structure", *Leadership Quarterly*, Vol. 2 No. 3, pp. 530-542.

Vroom, V.H. and Jago, A.G. (2007), "The role of the situation in leadership", *American Psychologist*, Vol. 62 Issue 1, pp. 17-24.

Yammarino, F.J. and Atwater, L.E. (1997). "Do managers see themselves as others see them? Implications of self-other rating agreement for human resources management", *Organizational Dynamics*, Vol. 25 No. 4, pp. 35-44.

Yukl, G. (2010), *Leadership in organizations*, Seventh edition, Prentice-Hall, Upper Saddle River, NJ.

Zaccaro, S. J., Gilbert, J.A., Thor, K.K. and Mumford, M.D. (1991), "Leadership and social intelligence: Linking social perceptiveness and behavior flexibility to leader effectiveness", *Leadership Quarterly,* Vol. 2, pp. 317-342.

Zaccaro, S.J. (2007), "Trait-based perspectives on leadership", *American Psychologist*, Vol. 62, No. 1, pp. 6-16.

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