Journal of
Management Policy and Practice

North American Business Press
Atlanta – Seattle – South Florida - Toronto

Journal of Management Policy and Practice

Volume 13(5)
ISSN 1913-8067

North American Business Press, Inc.
Atlanta – Seattle – South Florida - Toronto

For submission, subscription or copyright information, contact the editor at:

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Subscription Price: US$ 340/yr

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This Issue

This article presents a case study of the Pittsburgh New Music Ensemble ("PNME"), an arts organization transformed by reinventing its artistic product based on new methods of audience engagement. The PNME approach reveals valuable insights for artists, entrepreneurs, and scholars. These range from suggesting a methodology for artists and arts organizations to revitalize their art and reinvigorate their audience, to revealing new avenues for research on the nature of creativity within entrepreneurship. By viewing artistic innovation as a seminal act of entrepreneurship, scholars may contemplate how the arts can be more powerfully applied to mainstream entrepreneurship pedagogy and theory.

Organizations find the adoption of Enterprise Resource Planning (ERP) as a necessity to enhance success of focus on multiple competitive priorities. With the adoption of ERP comes the potential for success as well as failure. While studies have been conducted on the impact of change management and change to best business practices, the impact of focus on technology and the related correlation to successful ERP implementations remains in question. This research measures the impact of technology as correlated to successful ERP implementations in hopes to contribute to scholarly findings and advice to future practitioners for future success in ERP implementations.

We investigate the relationships between risk orientation, need for control and openness, on the one hand, and cultural intelligence on the other hand. Theory suggests positive relationships. Using survey data from the United States and France, we do find those positive relationships. Our study is the first we know of to test the link between risk orientation and cultural intelligence; it is only the second study of which we are aware to test the link between need for control and cultural intelligence. Finally, we also find our French respondents had a higher cultural intelligence than our American respondents, raising interesting questions for future research.

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The Aesthetic Product as Entrepreneurial Driver: An Arts Perspective on Entrepreneurial Innovation

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This article presents a case study of the Pittsburgh New Music Ensemble ("PNME"), an arts organization transformed by reinventing its artistic product based on new methods of audience engagement. The PNME approach reveals valuable insights for artists, entrepreneurs, and scholars. These range from suggesting a methodology for artists and arts organizations to revitalize their art and reinvigorate their audience, to revealing new avenues for research on the nature of creativity within entrepreneurship. By viewing artistic innovation as a seminal act of entrepreneurship, scholars may contemplate how the arts can be more powerfully applied to mainstream entrepreneurship pedagogy and theory.

INTRODUCTION

The past five years have been difficult ones for arts organizations. A 2008 study by the National Endowment for the Arts shows audience participation in "benchmark" arts events (which include plays, musicals, classical music or jazz concerts, ballet and opera) dropped to 34.6 percent, a five percent drop from 2002 and the lowest level since surveys began in 1982 (NEA Report, 2009, pp. 1-3). Though the report identifies a number of factors contributing to this decline, it does not attempt to identify efforts to stem the broad declines described within it. And while there are no formal studies of methods employed by organizations to reverse this downward trend, anecdotal evidence suggests that efforts tend to be either based on long-accepted (but not empirically proven) conventional wisdom (e.g., "Symphony audiences don't like contemporary music") or are random efforts that may be creative and even, in the short term, effective, but which are not driven by any sort of deeper understanding of the issues operating or the best ways to engage with those issues. The result of this situation is that artists and arts organizations on the whole continue to struggle, and the successes that do occur are random and rarely replicable.

This paper suggests that an entrepreneurial approach to the problem offers a vehicle through which artistic presenters can re-frame the challenge of audience (re-)building as one of connecting a product of value to the needs of a market, and in so doing, gain new insights into potential ways to reverse the downward trajectory of attendance and financial support that so many organizations face. By studying actual arts organizations that have successfully reinvigorated their audience we can also gain new insights into the application of entrepreneurship theory. The organization examined in this paper is just such an example, with implications for artist and non-artist entrepreneurs alike, as well as entrepreneurship theory and pedagogy.

THE CASE OF PITTSBURGH NEW MUSIC ENSEMBLE

The Pittsburgh New Music Ensemble, founded in 1976, is one of the nation's first professional ensembles devoted to the performance of contemporary chamber music.[1] For its first twenty five years PNME was like most other new music ensembles: founder-driven, operating on small budgets that could fluctuate widely from year to year, and with a modest audience made up of professional associates, friends of the artists, and a small core of aficionados. As the organization aged and its founder's energy flagged, the creative energy of the participants dissipated, audiences shrank, and performance quality sagged (a phenomenon commonly referred to "founders syndrome"). In the case of PNME, the situation was sufficiently dire that the Board of Directors recognized that nothing short of a radical rebuilding of the group would save it from oblivion. The founder announced his retirement, and after a difficult transition new Artistic and Executive Directors were hired with a mandate to transform the organization both artistically and, if necessary, structurally.

With the help of a major grant from a local foundation, the group undertook a year-long planning process to contemplate what needed to be done. They began by reflecting on their own significant experience as music presenters generally and of contemporary music in particular, listened to feedback from frequent attendees, and engaged in informal discussions with peer groups across the country. These conversations revealed that the challenges PNME was facing – small audiences and inconsistent quality of performances – were not unique. The result of this evaluative stage was the realization that a completely new artistic product was in order if the organization were to break out of pure "survival mode" that most groups of its kind were stuck in. Such a new artistic product would, in turn, likely require an organizational restructuring to execute. The directors then engaged in a creative dialogue to determine what, precisely, this new artistic product might look like.

At the core of the resulting transformation was a change of focus away from the traditional orientation of arts presenting organizations (particularly, but not exclusively, "classical" music groups), which might be expressed thusly: *this is what we have to offer; won't you come and see it?* This is the entrepreneurial equivalent of inventing a new widget without consideration of the marketplace and then hoping one can convince the public to buy it: when such an approach is undertaken in a commercial venue, the new widget is not likely to be a success. Yet this is the exact approach that the traditional fine arts have taken with their product for the better share of the last 150 years, justifying their stance by arguing that appreciating offerings of "high culture" is part and parcel of membership in a civilized society.[2] To put it bluntly and in market terms: "you *should* want to buy this. [Now eat your peas!]" When applied to an art form that is likely to have a smaller audience to begin with – such as contemporary chamber music – this attitude guarantees what is the accepted norm for such groups: tiny audiences, shoe-string financial survival, and an existence on the periphery of the larger cultural landscape.

The new directors of PNME took a different approach, however. They started with their own observations regarding the experience of the audience at contemporary music concerts, pondering what characteristics a new music concert needed to have in order to be more compelling both to existing patrons and to a broader range of people as well. By taking a critical look at the traditional concert paradigm and informed by numerous conversations with peer organizations and audience members, they concluded that a typical classical concert (and particularly a contemporary chamber music concert, with its frequent stage changes and a programming structure that tended to string together large numbers of shorter, unrelated works) created too many points at which the audience could (and likely would) disengage from the experience. Once disengaged, it is always difficult to regain focus. The result was a concert that only the most die-hard new music fans would endure, and even then patrons would often lament the down-time between works and the disconnected nature of the concert itself. This was contrasted with the experience of a film, in which most patrons will continue to watch even if they don't think the film is particularly good: the continuous, integrated nature of the medium itself makes disengagement much more difficult.

This revelation regarding how audiences interact with live art inspired a new format for PNME concerts, one in which programs were intentionally restructured to create thematic unity and theatrical

continuity. Set changes were carefully choreographed to minimize the disruption between pieces, and non-musical elements such as video, projected images and spoken word maintained continuity over the arc of the program (which often flowed without intermission or even pauses between works). Finally, theatrical elements such as lighting, costuming, and movement framed the program as a dramatic experience, one in which the continuous engagement of the audience was of paramount importance. PNME Artistic Director Kevin Noe has dubbed this model the "Theatre of Music."

These artistic changes in turn mandated organizational changes. In order to attract the most qualified artists capable of assuming a variety of roles beyond that of a traditional classical musician, PNME had to draw on artists from across the nation (and indeed internationally). Since conducting a traditional Fall-Spring season in this way would be prohibitively expensive, the season was converted to a summer festival format, presenting five weeks of concerts during late June and July. Given the intensity of the rehearsal schedule – and the need to schedule additional rehearsals for the many theatrical elements involved – artists were signed to contracts in which PNME was their sole commitment for the duration of the season. This in turn resulted in a different contract structure, a different rental arrangement with the venue (and indeed, a different venue), and a radically different cash flow (in which the vast majority of expenditures happened during a very narrow span of the calendar, requiring that nearly all of the year's fundraising needed to happen before the beginning of the season).

It is important to stress that the Theatre of Music has never amounted to a "dumbing down" of the artistic product for the sake of hopefully reaching new audiences (a frequent and unfortunate mistake many Classical music organizations make). My observations of classical music groups across country reveal that the first mistake made when trying to attract new audiences is to assume they are incapable of interacting with the music on a sophisticated level. This condescension is in fact one major reason why "dumbing down" tends to have the opposite of its intended effect. In contrast, a central tenant of the Theatre of Music paradigm is that audiences seeking an aesthetic experience actually *welcome* the exertion of significant mental energy required of such experiences, and therefore demanding audience engagement with the art is not something to be shied away from but rather embraced. The trick is to create the necessary setting in which an audience can experience a meaningful mental and emotional connection to the art even when the repertoire is challenging and unfamiliar. The various elements of the Theatre of Music, coupled with extreme care and intentionality in the choosing of repertoire to create continuity and a dramatic thread, allows PNME to program challenging contemporary repertoire chosen purely on its own merits. The addition of other visual and theatrical elements, and the focus on creation of thematic and performance continuity, are therefore merely tools employed to transform the overall aesthetic experience of the audience; the ultimate goal is to maintain engagement so that patrons can effectively connect with the expressive impact of the music. This is in direct contrast to artists or arts organizations that consciously choose their material based on what they believe will appeal to the broadest possible audience by asking the least of them (i.e., modifying the *core artistic content itself* to cater to the lowest common denominator in perceived audience tastes). Therefore, what distinguishes the model is not a compromise of traditional artistic standards (quality of repertoire and/or performance), but rather an innovative approach to how the art is framed and integrated into a dramatic/theatrical experience. The entire concert becomes a work of art in itself – a work designed with the utmost attention to detail and polish at every level and which is structured with the audience's experience of that work always foremost in mind.

In addition to being of interest to artists and presenters, the PNME case is an important entrepreneurial study as well, particularly in light of the fact that the premiere performance of the "new PNME" enjoyed attendance that was a company record at that time, and that in the eight years since the Theatre of Music was unveiled season attendance has grown more than 600 percent (a trend driven primarily by word-of-mouth and leveraging social networks as opposed to traditional marketing methods). In addition, the company has released two commercial recordings and received numerous accolades from critics, including special recognition at the International Fringe Festival in Edinburgh, Scotland. By any measure, PNME's transformation was an extraordinary entrepreneurial success – success driven by artistic innovation designed to connect their audience with their art.

THEORETICAL IMPLICATIONS

While the PNME study is a powerful one for artists, arts administrators, and arts educators to contemplate, it also has fascinating implications for several aspects of entrepreneurship theory. The broader application of the PNME case is where its real power resides; therefore the various implications are offered as springboards for continued research into the relationships between artistic creation, aesthetic consumption, and entrepreneurial activity.

Implications for Artists

As mentioned above, artists have traditionally taken the attitude that the self-expression of their artistic impulse was the defining force of their work and that audiences are, at best, incidental, and at worst, irrelevant. The PNME model proves that artistic excellence and authenticity need not be sacrificed in order to reach a wider audience. In fact, not only are authenticity and audience connection not mutually exclusive, it is the authenticity itself – when expressed with an understanding of consumer behavior – that is crucial to establishing and maintaining that connection. This is nothing short of a revolutionary concept to most classically trained artists, particularly musicians. It must also be distinguished from the long-held practice of creating artistic content *designed at the outset* for broad popular acceptance.[3] The PNME does not chose content based on perceived audience appeal, but rather structures programs with an understanding of audience behavior and sensibilities, creating a structure that is designed to maintain their interest and engagement with the art. The Theatre of Music model need not be a source of direct imitation for artists, but using an understanding of audience behavior as the central driver of creative reinvention of the concert experience can be a powerful concept for artists and presenters to apply to the challenge of shrinking audiences and dwindling financial support. It is also a potential "gateway" concept through which artists can begin to appreciate, in terms they already understand, how principles of entrepreneurship can be applied to their particular discipline.

Implications for Arts Administrators and Presenting Organizations

When faced with declining attendance and tightened budgets, most arts organizations react with external changes (a new marketing campaign, community outreach) or internal administrative changes (replacing or reorganization staff, recruiting a new crop of wealthy board members). These changes are sometimes successful in the short term, and can be valuable and even necessary components to an organization's survival. The downside to such an approach is that it rarely changes the underlying issues driving the problem: audiences and their communities are valuing the artistic product less, and, as in any market, the less a product is valued the less viable it will be in the marketplace. An approach in which consumer behavior becomes the impetus for transforming both the product and the method of delivering it is likely to have a greater chance of viability and sustainability. The challenges associated with this paradigm shift – from granting greater artistic autonomy to Artistic Directors to the need to renegotiate contracts with artists and restructure organizations – is the subject of future writings, but bringing the artistic product to the beginning of the problem solving process instead of leaving it on the sidelines is a critical concept for artists and administrators to embrace. An additional benefit to this approach is that it provides artists and administrators, often at odds with each other over the best way to revitalize their organization in economically sustainable ways, to find common ground from which to create mutually-agreeable solutions to the complex problems facing their institutions.

Theoretical Implications

Costumers and Demand for Artistic Products

The question of whether arts entrepreneurs find opportunities by studying their marketplace and seeking needs not currently being met, or create opportunities by supplying art to their communities at an appropriate quality and price is outlined by Preece (2011). The concept is further refined in the work of York, Sarasvathy, and Larson (2010), in which "latent demand" (unmet but identifiable needs articulated by consumers) is contrasted with "inchoate demand" ("unformed…[and] non-existent in an articulated

form")(p. 143). The PNME case clearly illustrates a fulfillment of inchoate demand. The architects of the Theatre of Music knew from their own experience, as well as, anecdotally, the experience of both existing audience members and potential audience members, that the typical contemporary chamber music concert was not, on the whole, a satisfying experience. The organization therefore redefined its artistic product based on this knowledge and their belief that if they could create a more satisfying experience for their audience, then ongoing demand would be generated. This also provides valuable support for the idea that the performing arts are an example of supplier-induced demand (Blaug, 2001, p. 127). Blaug, however, does not consider the creation of art forms driven by the consumer experience of the art, and York *et al.* apply the inchoate demand model solely to social entrepreneurship; further investigation of how these concepts apply to the arts could potentially generate useful application for artists and presenting organizations, as well as further illuminate the theories themselves.

Applications of the Effectuation Model

The mindset driving the Theatre of Music paradigm is reminiscent of the Effectuation Model articulated by Sarasvathy (2008), which asserts that entrepreneurship is a process borne out of creatively leveraging existing resources to connect with (or create) a new market rather than devising a process to deliver a pre-conceived product to an existing market (the traditional approach of artists). The PNME case suggests that Effectuation may be a more productive method of generating entrepreneurial opportunities in the arts, by encouraging artists and presenters to see the artistic product as a resource to be effectively leveraged to accomplish the ultimate goal of connecting with unmet need in the marketplace. This is fundamentally different than the usual treatment of the artistic product as the end in itself, and to see it as an isolated thing that exists in a state fundamentally disconnected from the needs of the audience it seeks to attract. A deeper exploration of these issues within the Effectuation Model is clearly in order, and will be the subject of future research on the part of the author.

Applications of the Hedonic Consumption Model

The Hedonic Consumption Model developed by Hirschman and Holbrook in the 1980s aimed to explain consumer behavior as it relates to products that are more about aesthetic experience (a concert, play, or film) than traditional consumer goods with specific utility (a toaster, table, or electric saw) (Hirschman and Holbrook, 1982). Subsequent work, synthesized by Charters (2006), further parses the consumption of non-utilitarian goods, distinguishing hedonic consumption as being primarily about pleasure (purchasing a bungee jumping excursion, for example) but not encompassing the broader range of cognitive and emotional experiences within complex aesthetic experiences (such as a Beethoven symphony or a Shakespeare play).

While the continuum between different categories of products (hedonic/aesthetic on one end of the scale and purely utilitarian on the other) is a critical observation, the focus of this work is still primarily as an instrument of marketing: the aim is to understand consumer behavior as it relates to existing products (Holbrook, 1982; Holbrook and Hirschman, 1982; Lacher, 1989; Lacher and Mizerski, 1994). Additionally, studies of aesthetic products (and the philosophical study of aesthetics in general) are based on the product first, and either studying how consumers react to it (hedonic consumption model) and/or the nature of the object itself that commands our attention (the philosophy of aesthetics) (Charters, 2006). In neither case is the consumer the beginning point of the process by which an aesthetic product is created. The PNME case is an example of inverting the traditional focus of the Hedonic Consumption Model, an inversion with direct implications for artists (the vast majority of artists and arts organizations proceed on the assumption that their product exists for the purpose of artistic expression, not the satisfaction of customer needs [Hirschman, 1983]), and for a broader understanding of how hedonic consumption can operate generally. Further research in this area may uncover a new perspective on the role of creativity and hedonic response within entrepreneurial innovation, one in which the aesthetic essence of a product isn't an incidental characteristic, but is the product itself. Such an understanding need not be limited to artistic ventures, as it would also provide insight into how creative ideas can be transformed into viable products in the marketplace.

Implications for Educators

Although educators have begun to codify pedagogical approaches to teaching arts entrepreneurship and to how best to combine mainstream business school entrepreneurship pedagogy with the idiosyncrasies of artistic career paths[4], the typical business school pedagogy remains largely untouched by a deeper understanding of creativity that partnering with arts entrepreneurs can potentially provide. A vast amount of work has been done on the nature of creativity, and recent work by Ward and others has explored the specific role of creativity in entrepreneurship (Ward, 2004); researchers such as Richard Florida have also recognized the increasing role of creative thought across broad swaths of the 21st-century economy.[5] But the question of *pedagogical application* of such work within business school curricula remains largely unexplored. The PNME study is an excellent example of how this vacuum can begin to be filled: by finding additional case studies of artistic creativity being the entrepreneurial seed for venture success, the business school can open up new ways to explore the role of creativity and model it for their students. What has previously been largely a one-way street (what the business school can teach artists) can become a two-way street (what artists can teach the business school).

CONCLUSIONS

During recent years of stress within the arts economy, artists and arts organizations in need of renewed vitality often look at their artistic product last; they will look first to issues of new funding, marketing initiatives, or other cosmetic and/or administrative issues. Often the art itself is simply taken for granted, or, ironically, is considered only as an afterthought and not as central to the question of organizational mission and identity. If artistic content is considered at all, it is usually in the context of altering it to accommodate the perceived tastes of a more popular audience, rather than examining the way in which the content they *wish* to perform is presented and framed. The result of this disconnect between the artistic product and its audience is that change initiatives are either short-lived or fail entirely, artistic integrity is often compromised, and the underlying issues of audience need go unaddressed.

The PNME case demonstrates how creating a new artistic product grounded in an understanding of how the consumer will receive it can be a powerful transformative force resulting in a rebirth of the organization, critical acclaim, and explosive audience growth while maintaining the highest artistic standards: an entrepreneurial success by any measure. The case also demonstrates the distinction between altering the artistic content in hopes of appealing to more individuals (the so-called "dumbing down" approach) versus using an understanding of audience behavior to create a more effective aesthetic experience of the art one wishes to present. The design of the Theatre of Music was driven by an understanding of consumer behavior, not an attempt to cater to the perceived tastes of a particular audience, and is therefore an example of a new type of artistic innovation with intriguing implications for a broad spectrum of the performing arts.

Further study is required to accumulate more cases like PNME. With a new category of artistic case studies, entrepreneurs can gain new insights into the nature of innovation by understanding the initial creative act through a new lens. With additional research, theories of demand generation, entrepreneurial effectuation, and hedonic consumption may be illuminated and broadened. This in turn has implications for the nature of entrepreneurship pedagogy, where educators continue to seek understanding one of the most sought-after aspects of entrepreneurship study: how to unleash creative thought.

ENDNOTES

1. I was Executive Director of PNME from 2003 (the second season of the "new PNME") through 2007.

2. By "traditional fine arts organizations," I refer to mainstream groups that specialize in canonic repertoire such as the symphony, ballet, opera, chamber music presenters, and mainstream theatre, along with the contemporary repertoire equivalents such as contemporary chamber music groups, modern dance companies, and contemporary/experimental theatre.

3. This is also in contrast with the time-honored tradition of an individual commissioning a specific work from an artist: while the artist is responding to the need of a particular customer (and may or not end up creating a work that pleases the customer and fulfills her/his expectations), this is distinct from developing a new way to connect artistic work with an audience en masse.

4. An excellent compendium of current thought on arts entrepreneurship pedagogy can be found in Disciplining the Arts: Teaching Entrepreneurship in Context (Beckman, 2011).

5. See Florida's seminal work, The Rise of the Creative Class.

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ACKNOWLEDGEMENTS

This paper was delivered at the 2012 Annual Meeting of the United States Association of Small Business and Entrepreneurship, January 13, 2012. The author is grateful for the insightful conversations and generous guidance provided by Gary Beckman (Director of Entrepreneurial Studies in the Arts at North Carolina State University) and Jeffrey York (Deming Entrepreneurship Center, Leeds School of Business at The University of Colorado-Boulder), and to the current leadership of Pittsburgh New Music Ensemble for their feedback on the articulation of the Theatre of Music model.

The Impact of a Focus on Change in Technology in Successful Implementation of SAP Enterprise Resource Planning Systems in North and South America

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Organizations find the adoption of Enterprise Resource Planning (ERP) as a necessity to enhance success of focus on multiple competitive priorities. With the adoption of ERP comes the potential for success as well as failure. While studies have been conducted on the impact of change management and change to best business practices, the impact of focus on technology and the related correlation to successful ERP implementations remains in question. This research measures the impact of technology as correlated to successful ERP implementations in hopes to contribute to scholarly findings and advice to future practitioners for future success in ERP implementations.

INTRODUCTION

Enterprise Resource Planning (ERP) applications are the most popular means of overall business process improvement since the North American adoption of the Japanese led concept of Just-in-time (JIT) management and inventory control in the 1970's (Oliver & Romm, 2002). Successful ERP systems can provide the backbone of business intelligence for an organization. This gives management a unified view of its processes and better enables control over those processes (Gale, 2002).

ERP systems are cross-functional enterprise systems driven by an integrated suite of software modules that maintain the central internal business processes of a company giving an integrated real-time view of core business processes. These modules operate interactively utilizing one database which shares all information necessary for each module's purpose, as well as user requirements (Scalle & Cotteleer, 1999). The systems give management and executives a unique and comprehensive look into the business and its processes.

The benefits of ERP systems are immense and in some instances necessary for competitive survival in today's global business climate. Benefits including heightened competitiveness, better communication, higher accuracy of information, and more timely information are all positive attributes gained by organizations with successfully implemented ERP systems (Umble et al., 2003). These attributes lead to

better decision-making, better vendor and customer relationships, and stronger customer loyalty. Along with the potential for huge benefits comes an equal price tag accompanied with well-documented failures driving some large organizations into bankruptcy. Many executives believe ERP implementation provides at least a moderate chance of damaging their organization because of possible problems encountered during the implementation of this vast system (Honig, 1999).

While the ERP methodology is an attractive and desirable tool for most twenty-first century corporations, successful implementation of ERP is difficult, challenging, expensive, and as a result frequently detrimental to organizations. Implementation requires leadership, change in technology, organizational change, and proper administration of knowledge management (Holsapple & Joshi, 2003). Organizations that have implemented ERP have followed various approaches for successful implementation; some as a result of research and others at the recommendation of vendors. Many attempt to implement ERP as they would any other type of change in information technology. Others follow a more intensive time consuming approach in pursuit of best business practices. Numerous other approaches are documented (Honig, 1999).

Considering the substantial dollar expenditure required and low success rate experienced in ERP implementations, it is critical for researchers to study and discover the benefit realized in ERP adoption, as well as posit the significant predictors' effects on ERP implementation practices (Brown & Vessey, 2003). Many organizations attempt to implement ERP as a change in technology while ignoring other critical attributes required at various levels of the organization that opportunely exist during such an implementation.

The attraction of adopting ERP systems to twenty first century competitors, coupled with the high cost and frequent failure experienced with ERP implementations leads to the need for further research on focal attributes for success in ERP implementation. While other studies have focused on the importance of business practices and people related issues, a study of the attention to the priority of adoption of new technology and the related impact on success is in order. As such, the purpose of this paper is to determine whether a focus on change in technology is necessary for successful implementation of ERP.

This question forms the basis for this study, and is thus fundamental to the following research. Since there is a gap in the literature associated with the connection of successful ERP implementation and a focus on the deployment of technology, the authors will focus on closing the knowledge deficit in this research paper.

The remainder of this paper is in four sections. The first section is the Literature Review composed of literature relevant to ERP implementation as a technology challenge versus other business problems, critical areas of ERP implementation, and critical success factors relating to people, business, and technology. Section two covers the research methodology and design of the research employed in this study. This section includes a description of the methodology, sample and population information, instrumentation, data collection and analysis procedures employed, researcher's philosophy, and theoretical framework guiding the research. Section three discusses the analysis of data and findings. . Section four concludes the research with a discussion of the findings, conclusions gained from the study, recommendations for further research, and assumptions / limitations of the study.

LITERATURE REVIEW

"ERP Systems represent the implementation of the old managerial dream of unifying and centralizing all the information systems required by the firm in one single system…" (Rowe, 1999). This single database system potentially places all elements of the organization in a position to work from one source of interrelated data – not multiple departments driven by islands of information.

When used appropriately, ERP provides a more effective and efficient environment that works from one database of information instead of relying on islands of information originated previously from each independent area of the organization. Successful ERP systems can be the backbone of business intelligence for an organization giving management a unified view of its processes better enabling control over those processes. While a response to the Y2K problems of many organizations, ERP systems were

known in the late 1990's and early 2000's for their extreme cost, high level of failure, and impractical justification to management (Gale, 2002). Contemporary strategies consider ERP necessary to improve organization productivity and efficiency in addition to being the base of business management and strategic positioning (Beheshti & Beheshti, 2010).

ERP Implementation – Technology Challenge versus Business Problems

As documented evidence illustrates, many ERP implementations result in failure. This failure often times is caused by the faulty approach the organization takes in planning the implementation process. While many anticipate the technical challenges to be the focal point of implementation efforts, they are often times not the main reason enterprise systems fail. ERP implementations, which focus exclusively on information technology, and not on the overall implementation of a system, are structured for failure. (Hsiuju & Chwen, 2004). Since the late 1990's, huge companies including Whirlpool, Hershey's Foods, Waste Management Incorporated, and W. L. Gore and Associates have encountered vast problems with their efforts to implement ERP. Several of these companies experienced problems that nearly bankrupt the company (Wah, 2000). Throughout the 2000's, the failure rate for ERP implementation continues to be high. The companies that have the kind of problems that lead to disaster are those that install ERP without thinking through its full business implications (Davenport, 1998).

Most companies find maximum benefits from treating technology first and foremost from a strategic and executive decision and point of view. They focus was on the effects and changes in the enterprise and not on the technology. Rather than just a technology implementation project, the major issues with ERP implementation are frequently business problems. Companies fail to reconcile the technological imperatives of the enterprise system with the business needs of the enterprise itself (Davenport, 1998). As such, the implementing managers must fully understand the critical areas that are affected by the installation of the ERP system.

Critical Success Factors (CSF's) of ERP Implementations

ERP implementation has some major issues and challenges. They can be summarized into three areas: 1) people, 2) technology, and 3) business (Nah et al. (2003), Somers and Nelson 2004, Laughlin 1999, and Krammeeraard et al. 2003). CSFs often have common characteristics, which can overlap, from one area into another. People and business related CSFs outnumber technological factors. Studies of ERP implementation failure support this emphasis on people and business related CSFs. In a survey of information technology managers, Information Week found that the top three reasons ERP projects failed was attributed to poor management (people / business), change in business goals (business), and lack of business management support (people / business) (Umble et al., 2003). Thus, ERP implementations often fail not because of the technology, but because of business and people issues (Somers & Nelson, 2004). Further, a study conducted among Fortune 1000 chief financial officers, found that CFO's ranked the five top CSFs of ERP implementations to be top management support (people), project champion (people), ERP teamwork and composition (people / business), project management (business / technology), and change management (people) (Nah et al., 2003). In addition, Rolls-Royce found in their ERP implementation found cultural (people), business, and technical difficulty as the primary areas of concern during their successful ERP implementation (Yusuf et al., 2004). Accordingly, CSFs should be grouped and viewed within these areas.

Other Critical Factors Success Approaches – Logical Associations

One approach to successful implementation of ERP follows the strategic alignment model of Henderson and Venkatraman (1999), which suggests that the success depends on different effective patterns of logical links, or "fits", among the "domains" of a firm. These domains are identified as business strategies, information technology strategy, organization infrastructure and processes, and information technology infrastructure and processes (Henderson & Venkatraman, 1999). Three factors for ERP success can be derived from these "fits". The first critical factor is the fit between business strategy and information technology strategy. The second fit is between the level of maturity of the information

technology infrastructure and the strategic role of information technology in relation to ERP. The third fit the fit between the methods used for implementing ERP and the change in organizational processes (Voordijk et al., 2003). Henderson and Venkatraman's (1999) approach further supports the segregation of CSFs into the areas of people, business, and technology related areas.

People, Business, and Technology Related ERP Critical Success Factors

To understand what factors are critical for success in ERP implementations, we reviewed works for four leading authors on the topic. Table 1 summarizes ERP implementation critical success factors (CSFs) emphasizing factors that affect people, business, and technology issues.

TABLE 1
CRITICAL SUCCESS FACTORS OF ERP IMPLEMENTATIONS BY SCHOLAR

Group	Critical Success Factor	Scholar			
		Nah et al. (2003)	Somers & Nelson (2004)	Laughlin (1999)	Kraemmeraard et al. (2003)
Technology	Appropriate Business & IT Legacy System	X			
Business	Business Plan & Vision	X	X	X	X
Business	Business Process Reengineering	X	X		X
People	Change And Expectation Management	X	X	X	
People	Communication	X	X	X	
People	ERP Teamwork & Composition	X	X	X	X
Business	Monitoring & Evaluation of Performance	X			
People	Project Champion	X	X		
Business	Project Management	X	X	X	
Technology	Software Development, Testing, & Troubleshooting	X			
People	Top Management Support & Involvement	X	X	X	X
People	Steering Committee		X		
People	Implementation Consultants		X		
People	Vendor-Customer Partnership, Tools, and Support		X		
People	User Training and Education		X		X
Business	Appropriate Software Selection		X		
Business	Minimize Customization		X		
Technology	Data Analysis and Conversion		X		
Technology	Defining the System Architecture		X		
Business	Dedicating Resources		X		
Business	Aggressive Schedule and Timelines			X	
Business	Focused Issue Resolution			X	
Business	Limited Scope			X	
Business	Early Success			X	
Business	Justification				X

Critical success factors that are affected by technology can be identified as: 1) appropriate business and information technology legacy systems, 2) software development, testing, and troubleshooting, 3) appropriate software selection, 4) data analysis and conversion, and 5) defining system architecture. The greater the complexity of legacy systems, the greater the amount of technological and organizational change required. To be successful, ERP implementation efforts must overcome issues of complexity arising from business and information technology legacy systems. A stable and successful business setting is essential, and success in other business areas is necessary for ERP implementation success (Roberts & Barrar, 1992).

In addition to appropriate business and legacy systems, software development, testing, and troubleshooting issues are CSFs for ERP implementations. Because of the high degree of integration of systems across the organization, development and testing perspectives unique to ERP projects must be well thought-out and managed. The overall ERP architecture should be established before deployment considering the most important requirements of the implementation (Murray & Coffin, 2001). Consequently, the use of appropriate modeling methods will aid in achieving ERP success. Requirement definitions should be created for documenting how the systems operate. Having a written sign off of requirement definitions protects all parties from downstream attack for non-documented "creeps" of scope and oversights within the creation of requirements definitions (Holland et al., 1999). While troubleshooting errors is critical, rigorous software testing eases implementation (Rosario, 2000).

Additional technological CSFs include data analysis and conversion and defining the system architecture. Accurate data is a fundamental requirement for the effectiveness of any system. The management of data converted and entered into the ERP system is a critical issue. Defining system architecture is a critical success factor as this provides the basis for running ERP software. Architecture choices and planning are especially during the design and procurement phase as system requirements of ERP systems may predicate specific needs (Somers & Nelson, 2004).

While the literature suggests focus on technology is often the source of failure, one would expect a focus on change in technology is necessary for successful implementation of ERP. Nevertheless, both the literature and scholars continually point out the large risk of potential failure in ERP due to the complexity of both technology change as well as change in business practices and culture in the organization. These facts would suggest a focus on change in technology would not be as necessary (or perhaps not necessary at all) for successful implementation of ERP. With these conflicting theories prevailing, the need for a study of importance of focus on technology on successful ERP implementations is in order if further substantiated.

RESEARCH METHODOLOGY AND DESIGN

Nature of the Study and Data Collection

This research is conducted using a quantitative methodology approach. The selection of instrument and collection of data supported the researchers with analyzing the achievement of success gained by adoption of ERP systems as correlated to the presence of focus in ERP implementation on change in technology. Participants in this study originated from North and South American organizations that completed their implementation of ERP in their organization more than one year prior to the date of the survey. The ERP systems implemented were developed and marketed by SAP, the world's leading provider of ERP systems holding a 24% market share; some 6 points higher than the nearest single competitor Oracle (Panorama Consulting, 2011).

To analyze the research question (“Is a focus on the change in technology required by an ERP adoption observed in successful ERP implementations?”), the authors collected empirical data about this topic. Survey questions about organizations’ reliance on technology and technology related actions were developed and the responses were assessed for success in the ERP implementation process. The questions were derived from the critical success factors relating to technology, as well as other items referred to in the literature review relating to technology.

The survey population consisted of over 3500 SAP users who are members of the Americas' SAP User's Group (ASUG). A sample of 600 random SAP user organizations having completed implementation of ERP more than one year after initial implementation and no more than 5 years subsequent to implementation represent the sample studied in this research. The survey of these 600 SAP user organizations resulted in a total of 239 responses, or 39.8% response rate (see Table 2). Sixty-six of these responses were not used because their implementations had occurred within the past year and fell outside the scope of the study. An additional forty-seven responses were not used due to incomplete survey responses. The final number of valid responses that were used totaled 126 representing a response rate of 21%. This response rate is within the acceptable level for e-mail surveys of this type (Prahalad & Hamel, 1990). Table 2 illustrates the distribution of the respondents to the questionnaire.

TABLE 2
SURVEY RESPONSE RATE

	N/n	% sample	% valid
Total Sample Size	600	100.0%	n/a
Total Responses	239	39.8%	n/a
Incomplete Responses	47	7.8%	n/a
Valid Responses to Survey*	126	21.0%	100.0%
Met At Least One Success Factor	64	10.7%	50.8%
Met No Success Factors	62	10.3%	49.2%
Met ROI Objective	41	6.8%	32.5%
Met All Objectives**	18	3.0%	14.3%

*Responses in which ERP was implemented more than 1 year prior to survey

**Met ROI and All Success Objectives

The survey instrument was made available via the Internet, to the sample under study via surveymonkey.com - an independent online survey organization. A random selection of SAP implementations, which had occurred in the past 3 years from the date of survey, formed the base of the sample for this study. All participants were notified prior to the survey and two follow-up notifications were also sent to encourage participation in the survey. The initial contact was made approximately one week prior to first contact instructing the user group sample on how to take the survey.

Analysis

Our analysis was based on the data received from the surveys. Each observation in the survey contained a response to attribute questions, as well as a coded indication of whether the respondent indicated his/her organization's implementation was a success (one or more success variables present) or not a success (no success in which no success variables were present), as determined from prior analysis described earlier. The data from these attribute responses was examined and summarized. Our analysis focused on the following tests: the frequency of attributes for success versus no success implementations, correlation of attributes to success and no success, and significance of difference for each attribute as it relates to success versus no success observations.

The first step in the analysis was to determine the tests most suitable for use; the data was first tested to evaluate the normality assumption. A visual observation of data graphed in a histogram, and the Kolmogorov-Smirnov test was conducted to evaluate the normality assumption. Based on these two tests, the normality assumption failed for all attributes in all categories. As a result, three non-parametric tests were selected; – the Spearman Rank Correlation for correlation testing purposes, the Kruskal-Wallis test, and the Mann Whitley test for test of significant differences.

RESULTS AND FINDINGS

The first section of this analysis describes the demographic information from the respondents based on their responses to the survey. Characteristics include the location of where the respondent company is based, annual sales of the company, and responsibility of the respondent, industry in which the company participates, implementation status of ERP in the company, and ERP modules implemented. This section also addresses how respondents were segregated into successful versus unsuccessful categories.

Over 88% of the respondent organizations were based in the United States with the remaining 10% evenly distributed over Mexico, Canada, and outside North America. Successful versus non-successful organizations were nearly identical to these percentages with neither section significantly over or under the total response splits.

The majority of the respondents were manufacturing companies (38.9% of the total) while government, food and beverage, and computer software and services ranked second, third, and fourth with 12.7%, 8.7% and 7.1% of the sample total, respectively. The percentages of success versus no success categories showed similar representation to the total sample, however, 13% fewer organizations were from the manufacturing area, and 10% more were from the government in the no success category versus the success category.

The largest number of organizations represented in the survey (31%) had annual sales between $1 and $5 billion dollars. The second (27%) and third (17.5%) largest categories of annual sales representing surveyed organizations reported sales of over $5 billion and $500 million to $1 Billion, respectively. The responses for success and no success categories were similar in rank and percent to the total response statistics with no significant deviation.

The majority of the survey respondents are from the information technology discipline (79%). The majority of respondents appear to be in higher-level positions with no significant difference in the number of respondents in success versus no success responses.

As mentioned earlier, organizations that indicated their implementation had taken place less than one year from the time of the survey were removed from valid responses in the sample. The reason for their removal is due to the fact that organizations need at least one year of ERP operation results in order to reasonably determine if ROI and success objectives have been met.

Over 48% of the respondent organizations reported implementing ERP more than 5 years prior to the survey, while 25.4% implemented ERP within 1 to 2 years prior to the survey. A significant difference was observed in the success versus no success categories with more than twice as many no success 1 to 2 years implementation were reported for no success (22 or 35.5%) than were in the success 1 to 2 years implementation category (10 or 15.6%). In addition, more than twice as many in the success category that implemented over 5 years prior were observed (41 or 64.1%) than in the no success category (20 or 32.3%).

The highest frequency of implementation teams was over 20 members large which also held true for success (73.4%) versus no success (79%) categories. Implementation teams with 10 to 20 members were the second highest frequency for both success (20.3%) and no success (14.5%) categories.

Top Management was responsible for the decision to employ ERP in 54% of the sample followed Business Process Leaders / Business Unit Managers with 23% of the sample. The results of the success and no success categories were very similar to the overall sample results.

A total of 27.8% (35) of the total 126 responses considered valid for the study did not consider any other ERP vendor for their implementation (25% or 16 of the success responses, 30.6% or 19 of the no success responses). Over 40% of all respondents looked at Oracle (SAP's top competition) and 33% looked at PeopleSoft (now a part of Oracle). In further analysis of the success versus no success category, the success respondent organizations looked at more ERP options 23.6% more of the time than the no success category.

Success versus No Success

The second step in the analysis focused on measuring the successful ERP implementations against unsuccessful. As previously noted in Table 2, of the 239 total responses, 126 responses were usable for this research purpose. The 126 valid responses were examined for ERP operations, whether they were successful or not. This success/no success determination was based on nine measurement criteria. Respondents indicating the presence of one of more of these factors were considered to have achieved success in adoption of their ERP system. The nine criteria measured as a part of the survey are:

1. Realized expected Return on investment
2. Realized ROI > 5%
3. Increased productivity => 2%
4. Reduced operational cost by 5%
5. Experienced reduction in scheduling and planning cycle > 50%
6. Experienced reduction in delivery times => 10%
7. Realized reduction in production time => 10%
8. Reduced inventory stock =>10%
9. Reduced late deliveries => 25%

These nine criteria were derived from the quantitative success factors cited in the "Attributes For Success" section of Chapter 2 Literature Review.

As shown in Table 2 previously, 64 of the 173 valid responses met at least one or more of the ERP surveyed success factors, leaving the remaining 62 of which responses indicated that no success factor was achieved.

TABLE 3
FREQUENCY OF CHANGE IN TECHNOLOGY FOCUS ATTRIBUTES

Frequency of Non-Successful Implementations Focusing on a Change in Technology

	Yes		Somewhat		No	
	n	*%*	*n*	*%*	*n*	*%*
Skilled Consultants	24	38.7%	32	51.6%	6	9.7%
ERP Vendor Involved	23	37.1%	26	41.9%	13	21.0%
ERP Software modified to meet needs	17	27.4%	30	48.4%	15	24.2%
Appropriate business and IT legacy systems used	26	41.9%	29	46.8%	7	11.3%
Project champion was knowledgeable about ERP and implementation	22	35.5%	25	40.3%	15	24.2%
ERP software was tested and "troubleshooted"	28	45.2%	29	46.8%	5	8.1%
ERP software selection was appropriate for business	39	62.9%	20	32.3%	3	4.8%
Historical data was analyzed and converted efficiently and logically	26	41.9%	24	38.7%	12	19.4%
System architecture well defined prior to implementation	26	41.9%	24	38.7%	12	19.4%
Technology was prepared to implement	36	58.1%	21	33.9%	5	8.1%

Frequency of Successful Implementations Focusing on Change in Technology

	Yes		Somewhat		No	
	n	%	*n*	%	*n*	%
Skilled Consultants	34	53.1%	26	40.6%	4	6.3%
ERP Vendor Involved	36	56.3%	19	29.7%	9	14.1%
ERP Software modified to meet needs	17	26.6%	27	42.2%	20	31.3%
Appropriate business and IT legacy systems used	45	70.3%	18	28.1%	1	1.6%
Project champion was knowledgeable about ERP and implementation	36	56.3%	20	31.3%	8	12.5%
ERP software was tested and "troubleshooted"	52	81.3%	12	18.8%	0	0.0%
ERP software selection was appropriate for business	53	82.8%	11	17.2%	0	0.0%
Historical data was analyzed and converted efficiently and logically	32	50.0%	24	37.5%	8	12.5%
System architecture well defined prior to implementation	42	65.6%	18	28.1%	4	6.3%
Technology was prepared to implement	45	70.3%	18	28.1%	1	1.6%

Tables 3 and 4 show the frequency of focus on technology attributes for success versus no success implementations. Nine of ten attributes revealed higher frequency in observations where success was observed as opposed to observations where success was not observed. The only observation which showed a higher frequency in no success observation, was "ERP software modified to meet needs." This attribute showed a .8% higher frequency for no success implementations versus success implementations. All other attributes show a significantly higher frequency in the success ERP implementations of at least 8% higher with some attributes being as much as 40% higher.

As previously stated, an alternate non-parametric test – the Spearman Rank Correlation, was used to analyze the change in technology focus attributes for correlation by attribute to success in ERP implementation. The Spearman Rank Correlation is an analysis tool used to show whether a correlation between two variables exists. If a correlation exists, the Sig. (2-tailed) *p* test value is less than .05. Another feature of the Spearman Correlation Rank analysis tool is the correlation coefficient. If the *p*-test value is less than .05 indicating a correlation exists, the correlation coefficient shows the strength of the correlation. The closer the correlation coefficient is to 1, the greater the correlation strength. Table 4 shows the results of the Spearman Rank Correlation.

The Spearman Correlation shows 3 of the 10 focus attributes indicate a correlation exist between the attribute and a successful ERP implementation. These three focus attributes are, 1) Appropriate business and IT legacy systems used, 2) ERP software was tested and "troubleshooted," and 3) ERP software selection was appropriate for business. However, further examination of the data indicates that each of the focus attributes showing a correlation shows a weak strength of correlation. This is observed in the correlation coefficient for each variable. For each of the three correlated variables, the closer the correlation coefficient is to 1, the correlation coefficient, the stronger the strength of the correlation. The correlation coefficient in two attributes is below .2 and under .4 in the third indicating a weak correlation in all three attributes.

TABLE 4
SPEARMAN'S CORRELATION RANK FOR FOCUS ON CHANGE IN TECHNOLOGY

	Spearman's Correlation Coefficient	Sig. (2-tailed)
Skilled Consultants	0.146	0.103
ERP vendor involved	0.120	0.181
ERP software modified to meet needs	0.054	0.550
Appropriate business and IT legacy systems used	0.210	0.019
Project champion was knowledgeable about ERP and Implementation	0.133	0.138
ERP software was tested and "troubleshooted"	0.378	0.000
ERP software selection was appropriate for business	0.229	0.010
Customization of software was minimized	0.005	0.953
Historical data was analyzed and converted efficiently and logically	0.077	0.394
System architecture well defined prior to implementation	0.142	0.115
Aggressive schedule and timeline used for implementation	0.169	0.060
Technologically prepared to implement?	0.131	0.146
ERP necessitated requirement of new skill set for computer proficiency?	0.071	0.432

Sig. (2-tailed) p test < .05 indicates a significant correlation

Considering the frequency of attributes present in successful ERP implementations and the results of the Spearman Correlation Rank were conflicting, the Mann Whitley test was conducted and considered appropriate to determine if a significant difference in the distribution of observations indicated success in ERP as correlated to the focus attributes. The Mann-Whitney test examines the difference in the distributions of success and no success observations. The results of the Mann Whitney test are shown in Table 5. The Mann Whitley tests for significance shows 3 of the 10 attributes have Asymp. Sig. (2-tailed) values less than .05, which indicate a significant difference in the distribution of change in technology attributes for success versus no success observations. The three attributes are: 1) Appropriate business and IT legacy systems used, 2) ERP software was tested and "troubleshooted," and 3) ERP software selection was appropriate for business. These three attributes are the same attributes that the Spearman Correlation Rank indicated a correlation existed.

Further examination of the Mann Whitley test indicates that these three attributes show a direction towards non successful implementations. This exists because the higher mean rank for each attribute of no success versus lower mean rank for success.

TABLE 5
MANN WHITLEY TEST FOR SIGNIFICANCE IN TECHNOLOGY CHANGE ATTRIBUTES

	Mean	Sig. Test	Mean Rank No Success	Mean Rank Success
Skilled Consultants	1.62	0.103	68.34	58.81
ERP vendor involved	1.66	0.180	67.03	59.03
ERP software modified to meet needs	2.01	0.548	61.65	65.29
Appropriate business and IT legacy systems used	1.40	0.019	69.86	56.46
Project champion was knowledgeable about ERP and Implementation	1.62	0.137	67.57	58.64
ERP software was tested and "troubleshooted"	1.39	0.00	74.70	51.84
ERP software selection was appropriate for business	1.27	0.011	69.54	56.77
Customization of software was minimized	1.68	0.953	63.18	59.81
Historical data was analyzed and converted efficiently and logically	1.64	0.391	65.63	60.49
System architecture well defined prior to implementation	1.49	0.114	67.62	58.59
Aggressive schedule and timeline used for implementation	1.30	0.060	58.25	59.81
Technologically prepared to implement	1.39	0.146	67.03	59.16
ERP necessitated new skill set for computer proficiency	1.29	0.429	64.43	60.63

Sig. (2-tailed) *p* test < .05 indicates a significant correlation

Based on the results of the Spearman Correlation Rank, and the Mann Whitney test for change in technology focus attributes, there is insufficient evidence to conclude a focus in technology attributes is necessary for successful ERP implementations.

DISCUSSION

So What Does the Data Tell Us?

A review of the descriptive statistics indicates a higher frequency in observations where success was observed (90%) as compared to those observations in which success was not observed (10%) in ERP implementations. The only attribute that exhibited a higher frequency for unsuccessful ERP implementations was "ERP software modified to meet needs," This sole reason for this could stem from two main reasons. One explanation could be that the successful company's employs best practices attributes more often. This approach favors little customization of ERP software. Another explanation

could be SAP's continuing efforts to make their ERP systems as flexible as possible, by requiring little customization of the existing software.

The Spearman Rank Correlation indicated a 30% focus toward successful ERP implementations versus 70% unsuccessful. These three attributes include, 1) appropriate business and IT legacy systems used, 2) ERP software was tested and "troubleshooted," and 3) ERP software selection was appropriate for business. Further analysis of the Spearman Rank results revealed a weak correlation for all three of these elements to successful ERP implementations. In addition, the Mann Whitley tests for significance showed 3 of the 10 attributes have Asymp. Sig. (2-tailed) values less than .05, which indicate a significant difference in the distribution of change in technology attributes for success versus no success observations. The three attributes are: 1) Appropriate business and IT legacy systems used, 2) ERP software was tested and "troubleshooted," and 3) ERP software selection were appropriate for business. These three attributes are the same attributes that the Spearman Correlation Rank indicated a correlation existed. Further study of the Mann Whitley test indicates these three attributes show direction to no success implementations as witnessed through the higher mean rank for each attribute for no success versus lower mean rank for success. Neither the Mann Whitney nor the Spearman Correlation Rank results supported the findings of the analysis of frequency.

Due to the conflicting results, it can be concluded that a lack of evidence exists to show any correlation of focus on technology attributes to successful ERP implementations. This conclusion is supported by the 70% lack of correlated attributes, the weakness in the attributes (30% of the total) to successful ERP implementations in the Spearman Correlation Rank, and the inconsistency of significant differences of attributes supporting non-successful ERP implementations.

CONCLUSIONS

The purpose of this study was to understand the relationship of successful ERP implementation and the adoption of new technology during implementation process. Based on the findings of this research, we can say that, overall, when SAP ERP systems are implemented, 50.8% of implementations show successful results. This success is measured in terms of achieving at least one success attribute such as

- realizing target return on investment, or
- realizing return on investment greater than 5%,
- increasing productivity by at least 2%,
- reducing operational cost by at least 5%,
- reduce scheduling and planning of more than 50%,
- reduction in delivery time by at least 10%,
- reduction in production time by at least 10%, r
- education in inventory by at least 10%,
- reduction in late deliveries by at least 25%.

This research also shows that ERP implementations using SAP meet their return on investment objectives 32.5% of the time, and reach all previously mentioned success attributes 14.3% of the time.

We can also conclude that our study of the SAP ERP implementations we surveyed show little to no correlation to a focus on change in technology. While the descriptive statistics for attributes showed that successful ERP implementations employed 9 of 10 technology attributes more often than in no success implementations, further testing for correlation proved inconclusive results that a correlation existed. Considering the fact that ERP is an intensive information system based initiative as noted in the review of literature, this finding is surprising. However, considering the fact that while all implementations have diverse demographic factors (i.e. different modules implemented, different business / industry in which implementations took place, etc.) which may have more diverse or different change management and best business practices, SAP may have perfected the technological side of ERP implementations to the degree

that firms do not have to be as concerned with changes in technology as they do with focusing on change management and best business practices.

MANAGERIAL IMPLICATIONS

The intent of this research was to identify whether a correlation exists between successful implementation of ERP and the presence and / or absence of focus on a change in technology. Based on the conclusions and findings, the researchers suggest the following recommendations to organizations implementing SAP ERP:

1) It is recommended that organizations considering ERP system implementations consider the success versus no success rate of success as gained from employing ERP before they commit to the ERP initiative. It is recommended that they consider the demonstrated rate of success strongly as the commitment, attention, discipline, and change required for successful implementations is significant.

2) It is recommended that all organizations implementing ERP consider all critical success factors, success attributes, and groups of success attributes when planning for ERP implementations.

3) It is recommended that all organizations implementing ERP consider prioritizing their focus on the effects and changes in the enterprise as a result of implementing ERP and not on the technology used in implementation. Appropriate emphasis should be placed on ERP technological concerns (i.e. selecting the proper ERP system, mapping old and new systems, migration of data, etc.); however, the business needs of the enterprise itself should take higher priority.

4) It is recommended that technology be treated from a strategic and executive decision and point of view with more emphasis placed on business problems in ERP implementations.

5) It is recommended that top management be informed of the commitment to an ERP implementation (including the amount of resources necessary for successful ERP implementations, the critical success factors necessary for ERP implementations, and the demonstrated results of failures (i.e. running over budget) in order to prepare and make contingency plans for the possible impact of ERP implementations.

6) It is recommended that organizations educate users, management, suppliers, and customers that while ERP does incorporate an adoption of new technology and focuses to some degree on an information system based approach, a focus on business challenges and problems existing from adoption of ERP rather than the change in technology are more important.

ASSUMPTIONS AND LIMITATIONS, AND FUTURE RESEARCH OF STUDY

The following assumptions and limitations apply to this research:

1) The areas represented in the survey instrument were extracted from critical success factors and grouped into three categories: technology (of which change in technology is focused), people (i.e. users or employees, of which change management is focused), and business practice (of which change from a currently employed practice to a new best business practice is focused).

2) An assumption was made that a successful ERP implementation can be determined by identifying minimum goals of an ERP system, which are identified in the literature review.

3) The respondents honestly answered the survey and had no reason to do otherwise.

4) Data to corroborate the existence of a correlation between ERP success and successful ERP implementation attribute groups can be gathered through the survey instrument.

5) Respondents of the survey had responsibility, as well as the appropriate proficiency for making decisions regarding ERP implementation, for their respective companies implementing ERP.

6) The survey instrument was structured for the purpose of finding comprehensive factual unbiased information was appropriate for the assessment of such information, and the statistical

procedures applied were appropriate to measure the significance of a measured correlation between success and the existence of the focus areas previously mentioned.

7) The survey instrument was dependent upon self-reported data as well as subjective opinions.

While this study provides comprehensive research to the presence of significant focus for successful ERP implementations, it raises additional questions for further research. Recommendations for further research include the following:

1) Conduct a study of Oracle and other ERP implementations to compare to the SAP results. Test for similar findings noting the similarities and differences between different ERP vendor offerings as correlated to successful ERP implementations.

2) Conduct a study to further understand and validate why a focus in change in technology showed no significance. Such a study might include a comparison of various ERP vendors to test for differences in the focus on technology attribute for organizations favoring particular vendors from a technology standpoint.

3) Conduct a study to validate and further understand the success measures specific to organizations measuring ERP success.

4) Conduct a study of correlation of individual ERP modules and the combination of ERP modules to ERP success measures for further analysis of technological reliance and correlated success.

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APPENDIX A

The survey questions used to analyze the research question are as follows:

Please indicate the extent to which the statements below are true for your organization's implementation.
i. The project had skilled consultants.
k. The ERP vendor was involved in our project.
m. The ERP software was modified to meet our needs.
r. Appropriate business and IT legacy systems were used.
u. The project champion was knowledgeable about ERP and the implementation.
x. The ERP software selection was appropriate for our business needs.
z. Historical data was analyzed and converted in an efficient logical manner.
aa. System architecture was well defined prior to implementation.

Please answer the questions below regarding your implementation.
g. Was your organization technologically prepared to implement?
i. Has ERP implementation necessitated the requirement of a new skill set among employees in terms of computer proficiency?

Antecedents of Cultural Intelligence: The Role of Risk, Control, and Openness in France and the United States

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We investigate the relationships between risk orientation, need for control and openness, on the one hand, and cultural intelligence on the other hand. Theory suggests positive relationships. Using survey data from the United States and France, we do find those positive relationships. Our study is the first we know of to test the link between risk orientation and cultural intelligence; it is only the second study of which we are aware to test the link between need for control and cultural intelligence. Finally, we also find our French respondents had a higher cultural intelligence than our American respondents, raising interesting questions for future research.

INTRODUCTION

One does not need to look hard to find examples where an individual's ability to work in environments characterized by culturally diverse individuals has resulted in failures to communicate and lost business opportunities. Often such dysfunction can result not only with a business executive operating in a foreign country, but increasingly can occur as well within the culturally diverse workforces that make up domestic operations (Rocksthul & Ng, 2008; Jassawalla et al, 2004). Businesses as a result increasingly need to give careful consideration to selecting and developing employees who have the cultural intelligence to successfully function in our globalized and multicultural world of business.

Cultural intelligence (CQ) is a relatively new theoretical concept. It has been defined by Earley and Ang (2003) as an individual's ability to engage successfully in diverse cultural environments. At the present time, researchers and business managers are continuing the effort to identify and define the individual characteristics which facilitate the ability of the individual to successfully navigate and succeed in culturally different environments ranging from expatriate assignments in a foreign country to those who will need to function in multicultural teams, or even teams of a relatively homogeneous cultural make up that are working on projects with multicultural implications. The objective of this paper is to examine three potentially important antecedents of cultural intelligence: openness to experience, the need for control, and risk orientation. These characteristics will be examined with university business students in the United States and France.

LITERATURE REVIEW

Cultural Intelligence

Cultural intelligence (CQ) is defined as a multidimensional construct that encompasses an individual's capability to function and manage effectively in culturally diverse settings (Earley & Ang, 2003). This definition can be seen to be consistent with Schmidt and Hunter's (2000: 3) definition of general intelligence "the ability to grasp and reason correctly with abstractions (concepts) and solve problems". It also can be seen as fitting the more global approach to intelligence as suggested by theories of practical and multiple intelligences (Sternberg & Wagner, 1986; Sternberg & Detterman, 1986). Cultural intelligence is not only seen as one of these "multiple intelligences", it is also seen as conceptually and measurably distinct from others such as general or analytical intelligence (IQ), social intelligence (SI), and emotional intelligence (EQ) (Elenkov and Pimentel, 2008) with a distinguishing characteristic that cultural intelligence applies to multiple cultural settings while dimensions of social and emotional intelligence may vary between different cultural setting (Thomas, 2006).

As conceived by Earley and Ang (2003) and developed by Van Dyne, Ang, and Koh (2008), the factors that make up the discrete construct of cultural intelligence (Total Cultural Intelligence or TCQ) include: Metacognitive CQ; Cognitive CQ; Motivational CQ; and Behavioral CQ. Metacognitive CQ refers to the conscious awareness an individual has regarding cultural interactions. Cognitive CQ is seen to reflect the knowledge of a group's values, beliefs, and norms. Motivational CQ reflects the capability to direct energy to learning about cultural differences. Finally, Behavioral CQ reflects the capability to choose appropriate verbal and physical actions when interacting with people of different cultures.

Research has suggested that cultural intelligence has an impact on cross-cultural adaptation (Ward & Fischer, 2008), task performance (Ang et al., 2007), trust within teams (Rockstuhl & Ng, 2008), group performance (Huber & Lewis, 2010), expatriate performance (Lee & Sukoco, 2010), and global leadership skills (Ng, Van Dyne & Ang, 2009). There are also a number of antecedents of cultural intelligence that have been identified and/or proposed. These include international travel, work experience, study abroad, and perceived self-efficacy (MacNab, B. & Worthley, 2011; Crowne, K. 2008), language skills, living in diverse cultural settings, cross-cultural work experience (Triandis, 2008), parental and educational experiences (Shannon & Begley, 2008), and personality (Ang & Van Dyne, 2008; Shaffer & Miller, 2008).

Openness, Risk Orientation, and Need for Control

It is well known in the Western-based literature that personality can predict behavior and performance (Barrick & Mount, 1991). While there is little agreement among psychologists as to the definition of personality, within the area of industrial and organizational psychology personality descriptions tend to focus on personality traits and the generally agreed upon structure of personality traits known as the "Big Five" (Heggestad, 2007). The Big Five framework has considerable support among a wide range of psychologists and has become the most widely used and extensively researched model of personality (Gosling, Rentfrow & Swann, 2003). McCrae and Costa (1987) labeled the five trait dimensions as: neuroticism versus emotional stability; extraversion or surgency; openness to experience; agreeableness versus antagonism; and conscientiousness versus undirectedness.

Ang & Van Dyne (2008) have suggested that some of the Big Five personality dimensions could be antecedents of cultural intelligence, and researchers have also concluded that the relationship between cultural intelligence and personality is a key issue for the theoretical and empirical precision of cultural intelligence research (Ward & Fischer, 2008). Klafehn et al., (2008) and Triandis (2008) suggested one personality dimension in particular, openness to experience (referred to in this paper as "openness"), may reduce the negative effects of an individual's interaction with different cultures and thus contribute to a higher cultural intelligence. According to McCrae & Costa (1987) and Oolders, Chernyshenko & Stark (2008) openness includes traits such as being curious, imaginative and excitable; having wide interests; being artistic; and being unconventional; as well as high levels of intellectual efficiency, tolerance, flexibility, depth, and ingenuity. Ang, Van Dyne & Koh (2006) found that of the Big Five dimensions,

openness had the strongest connection by directly impacting all four factors of total cultural intelligence. Thus the first hypothesis of this study is:

> *H1: Openness will have a significant positive influence on the subject's level of cultural intelligence.*

It is believed that risk orientation is an important factor in many aspects of managerial behavior and that risk itself is most commonly conceived as reflecting variation in the distribution of variable outcomes (March & Shapira, 1987). When working with individuals from cultures very different from her or his own, an employee may perceive varying degrees of risk associated with decisions impacting social interaction and communication, with the results of such communication decisions having such variable outcomes. The degree to which individuals accept such risks tends to be a relatively stable feature of the individual's personality and conventional decision theory suggests that a decision such as choosing to interact with a person from a very different culture involves to some degree the individual perception of the trade-off between risk and expected return (March & Shapira, 1987). The greater the perceived benefit from taking a risk, the more likely the individual is to take it (Denrell, 2007). Cultural intelligence is a learned ability (Klafehn, et al., 2008; Tarique & Takeuchi, 2008) and it has been suggested that one's risk orientation plays an important role in learning and cognitive development (Lundeberg & Moch, 1995). This seems to suggest that individuals with higher cultural intelligence would seem to perceive the benefits of taking the risks necessary to learn how to interact with people from different cultures. We are not aware of any other study that has examined risk orientation as a potential antecedent of cultural intelligence. Therefore:

> *H2: Risk orientation will have a significant positive influence on the subject's level of cultural intelligence.*

Need for control has been defined as an individual's desire and intent to exert influence over situations in which a person operates, and can be seen as basic and universal (Tay, Westman & Chia, 2008). The need for control may manifest itself as the desire for mastery over one's environment (DeCharmes, 1968). For those people in business setting such a desire may lead them to want the ability to function smoothly and successfully in multicultural settings, and in fact Tay et al. (2008) found the need for control to have a significant positive relationship with cultural intelligence with a sample of short-term business travelers. To date, this is the only study we can find that addresses directly the relationship of need for control and cultural intelligence. Therefore:

> *H3: The need for control will have a significant positive influence on the subject's level of cultural intelligence*.

METHODOLOGY

France and the United States were chosen for an initial analysis. According to House, Hanges, Javidan, Dorfman & Gupta (2004), the two countries are in distinctly different regional cultural clusters: the Latin European cluster for France and the Anglo cluster for the United States. They were also chosen due to the ability of the same researcher to gather data, thus helping to assure a common method which was classroom administered and required a non-specific introduction to the subjects suggesting a general cross-country study examining various individual characteristics of university business students. While participation in the survey was voluntary, all subjects present chose to participate. One university in each country was used in this study with the target population being upper level undergraduate as well as first or second year graduate business students in both universities. For each country, only responses from citizens of that country were used. Consequently, seven surveys completed by non-U.S. citizens were dropped from the U.S. data, and 41 surveys completed by non-French citizens were dropped from the

French data. When answering the biographical question regarding year in university, the year of university question options in France included the two years of post high school university preparation as taken by the subjects (thus the French student was expected to be a little older than the U.S. student). The result was a sample of 166 subjects from the U.S. and 113 from France (see Table 1, below, for details).

Cultural intelligence was measured using the self-report instrument developed and validated by Van Dyne, Ang & Koh (2008). During their validation process they identified the 20 items with the strongest psychometric properties with a Chi-square of 822.26 (164 *df*), CFI of 0.92 and RMESA of 0.08. Nested model comparisons demonstrated the superiority of the hypothesized four-factor CQ model. The instrument was then tested for generalizability across samples, and analysis using structured equation modeling (SEM) demonstrated good fit also finding acceptable Cronbach's alphas along with Chi-Square of 381.28, CFI of .96, and RMSEA of .05. They also completed an analysis of generalizability across time, generalizability across countries, generalizability across methods (observer report and self-report), as well as discriminant validity, incremental validity, and predictive validity (with cultural decision-making, interactional adjustment, and mental well-being as dependent variables). The study concludes that the construct appears to have a clear, robust, and meaningful structure. Shannon & Begley (2008) confirmed the psychometric properties of the Van Dyne, Ang & Koh (2008) model to be stable. Factor analysis (Principal Component & Varimax Rotation with Kaiser Normalization) done on this sample also confirmed satisfactory psychometric properties (see Table 2, below).

Openness was measured using a Big Five personality scale developed by Gosling et al. (2003) who point out that the Big Five structure enjoys considerable support among international psychologists. The research of these international psychologists has resulted in a range of instruments with as many as 240 item scales to as few as 5 item scales that can be used depending on a number of factors including: the purpose or objective of administering the instrument (diagnoses of a suspected psychological illness or general employment selection process); the need for very high levels of psychometric preciseness; and the concern of the researcher over the length of the questionnaire being administered and possible subject concentration and fatigue. Gosling et al. (2003) developed and tested the 10 item measurement used in this current study and found satisfactory convergent validity with the often-used and highly-regarded Big Five Inventory (BFI) of John & Srivastava (1999). They point out the BFI in turn shows high convergent validity with other self-report scales and peer rating scales of the Big Five. They also found the 10-item scale (TIPI) to have test-retest reliability, satisfactory patterns of predicted external correlations, and convergence between self-rated and observer ratings. Factor analysis (Principal Component & Varimax Rotation with Kaiser Normalization) using this sample confirmed satisfactory structural properties (see Table 3, below).

Since pilot tests of the instrument in this current study took subjects between 25 and 30 minutes to complete, we were concerned about subject fatigue. Consequently, we took Gosling et al.'s (2003) recommendation to use this 10-item instrument (TIPI) in such a situation. Thus two items were used to measure openness and were based on the extent to which the **pair** of traits is seen to apply to the subject (1 = strongly disagree to 7=strongly agree). The two items were: Question 5. Open to new experiences, complex; Question 10. Conventional, uncreative (reverse scored).

The need for control was measured using questions from the Tay et al. (2008) study. Three questions were used in the survey, however factor analysis (Principal Component & Varimax Rotation with Kaiser Normalization) suggested that one of the three questions did not load with the other two and was therefore dropped from this analysis. The remaining two questions (see Table 3, below) were "To what extent are you able to initiate various things in your daily work?", and "To what extent is it important to you to determine the way your work is done?" (1=very little extent; 6= very great extent).

Risk orientation was measured using two questions: "To what extent are you comfortable not knowing what the outcome will be of an action you have taken?" and "To what extent are you willing to take a calculated moderated risk to get ahead?" (Segal, Borgia & Schoenfield, 2005). Factor analysis (Principal Component & Varimax Rotation with Kaiser Normalization) using this sample suggested satisfactory structure (see Table 3, below).

Cronbach's alpha was used to examine internal reliability with all variables having satisfactory scores of between 0.69 and 0.76.

Finally, Age, Gender and Country were introduced into the model as control variables. Age was simply the age of the respondent. We suggest that Age might be positively related to cultural intelligence, as a person's age may be a proxy for experiences that could engender greater cultural intelligence. Gender was a dummy variable scored 1 if the respondent was a woman and 0 if the respondent was a man. We do not suggest a statistically significant relationship between a Gender and Total Cultural Intelligence. Country was a dummy variable scored 1 if the respondent was French and 0 if the respondent was from the United States. We suspect that the greater proximity of French students to other countries might lead them to have a higher cultural intelligence, and so we suggest a potential positive relationship between Country and Total Cultural Intelligence.

RESULTS

As can be seen in Table 1, data from a total of 279 subjects were used in this study with 166 subjects from the United States and 113 subjects from France. While the number of women was the same in both countries the number of men in France (42) was considerably smaller than in the U.S. (95). With the average age of 22.8 the country differences reflected the typical trend of French students being slightly older (1.8 years) due to many of the students having attended a two year preparatory program prior to their going to the private university from which the data were collected.

TABLE 1
SUBJECT STATISTICS

	France	USA	Total
Men	42	95	137
Women	71	71	142
Total	113	166	279
Age	23.5	21.7	22.8
Univ. yrs.	4.0	3.6	3.8

Table 2 confirms previous studies indicating the acceptable factor loading for each of the four cultural intelligence dimensions. Table 3, as discussed above, shows acceptable factor loadings to identify and confirm the independent variable items used in this study.

Table 4 indicates the variable correlations suggesting significant correlations between each of the independent variables and Total Cultural Intelligence (TCQ) as well as suggesting significant correlations between the Need for Control (or "Control") and the other two independent variables (Risk Orientation, or "Risk" and Openness to Experience, or "Openness"). The strength of the relationship between the dependent variable (Cultural Intelligence) and each of the independent variables (Openness, Risk, Control) will therefore be attenuated by the correlation among the independent variables, as greater correlation results in higher variance and so a lower t-test statistic result (Kmenta, 1986).

TABLE 2
FACTOR ANALYSIS: CQ COMPONENTS (TOTAL SAMPLE*)

	MetaCognitive	Cognitive	Motivational	Behavioral
Q1	.818			
Q5	.391			
Q9	.611			
Q13	.345			
Q2		.578		
Q6		.350		
Q10		.726		
Q14		.570		
Q17		.724		
Q20		.649		
Q3			.781	
Q7			.509	
Q11			.616	
Q15			.780	
Q18			.440	
Q4				.608
Q8				.675
Q12				.660
Q16				.718
Q19				.671

*individual country results did not indicate any significant differences

TABLE 3
FACTOR ANALYSIS: INDEPENDENT VARIABLES (TOTAL SAMPLE*)

	Risk	Control	Openness
Q21	.560		
Q31	.784		
Q25		.575	
Q28		.500	
Q42			.514
Q47			.752

*individual country results did not indicate any significant differences

TABLE 4
DESCRIPTIVE STATISTICS AND CORRELATIONS

	Mean	SD	TCQ	Openness	Risk	Control
TCQ	4.50	0.75	1			
Openness	5.46	1.04	.122*	1		
Risk	3.49	0.76	.157**	-.021	1	
Control	4.57	0.69	.241**	.180**	.244**	1

*p>.05; **p>.01

Table 5 summarizes the hierarchical ordinary least-squares regression results. Using standardized betas, the table shows that Age and Gender effects were not significant in any of the 5 steps. Age and Gender are both highly correlated (coefficients of 0.214 and 0.200) with Country, and Gender is also correlated with Risk (coefficient of -0.141), which may explain why they are not statistically significant.

TABLE 5
HIERARCHICAL OLS REGRESSION RESULTS

	Step 1 *beta*	Step 2 *beta*	Step 3 *beta*	Step 4 *beta*	Step 5 *Beta*
Age	.019	.013	.009	.010	.041
Gender	.000	-.041	-.078	-.047	-.025
Country		.241**	.174**	.274**	.347***
Openness			.237***	.160***	.127**
Risk				.010*	.119*
Control					.181**
Dependent Variable	TCQ	TCQ	TCQ	TCQ	TCQ
Adj. R^2	.00	.024*	.080***	.091***	.109***
F-score	1.60	3.28	7.00	6.20	6.42
Δ Adj. R^2	.0	.024**	.056***	.011*	.018*

*p>.05; **p>.01; ***p>.001

We investigated the control variables a bit further. For Age, we find a more interesting story than suggested by the reported regression results. Age is correlated with Total Cultural Intelligence (correlation coefficient of 0.108). In addition, when Total Cultural Intelligence was regressed only against Age (to avoid problems of correlations with other independent variables) the results were promising even given the skewed range of ages in this sample (250 of the 279 respondents, or 90%, are aged 18 to 25): the Adjusted R^2 of the model was only 0.01 but the parameter estimate for Age was positive and statistically significant at the 0.036 level (one-sided). Most interesting, though, was a comparison of means of Total Cultural Intelligence for two groups at opposite ends of the age spectrum: (1) students aged 25 to 49 (there were 47 of them) and (2) students aged 18 and 19 (there were 49 of them). The middle group, those aged 20 to 24, constituted the bulk of the respondents. We find that the oldest group had an average Total Cultural Intelligence score of 4.709 while the youngest group had an average score of 4.162. A t-test comparison of means shows that these are statistically different at the 0.001 two-sided level, and so the oldest group has a higher cultural intelligence than the youngest group and age is positively related to cultural intelligence.

Gender has almost a 0 correlation with Cultural Intelligence: a correlation coefficient of 0.005; and when Cultural Intelligence was regressed only against Gender (again, to avoid problems of correlations with other independent variables) the Adjusted R^2 was -0.004.

The Country control variable was found to be significant when included with the other two control variables and also in each step where each of the independent variables was added, even given its correlation with Control (coefficient of -0.217). This is particularly impressive given its inter-correlations, which generally reduce statistical significance by increasing the variance of the estimate. Thus Country alone explained a small but significant ($p<.01$) 2.4% of the variance of Total Cultural Intelligence. As we conjectured, the French students had a higher cultural intelligence than students from the United States.

The order in which the independent study variables were introduced into the model was identified using stepwise regression. The personality variable of Openness to Experiences increased the variance explained by the model from 0.024 with just the three control variables, to 8% with the resultant change

in Adjusted R^2 being significant ($p<0.001$). The final two independent variables of Risk Orientation and Need for Control increased the percentage on variance explained to 9.1% ($p<0.05$) and 10.9% ($p<0.05$) respectively. Collinearity between model elements was examined using variance inflationary factor analysis and results found no evidence of significant collinearity with VIF scores of between 1.0 and 1.6. Scores of less than 5 are generally considered to reflect no significant collinearity (Levine et al., 2005).

Finally, a comparison of means between countries was completed (see Table 6) indicating – as suggested by the regression analysis – a significant difference ($p=0.002$) between Total Cultural Intelligence means with France at 4.65 and the U.S. at 4.39. Also, we find that the Need for Control was significantly higher ($p=.000$) in the U.S. (4.75) than in France (4.40), while the analysis suggests no significant difference between the countries in the means of Openness to Experience and Risk Orientation.

TABLE 6
COMPARISON OF MEANS
(*t*-tests assuming unequal variances)

	TCQ US(FR)	Openness US(FR)	Risk US(FR)	Control US(FR)
Means	4.39(4.65)	5.47(5.44)	3.0(2.89)	4.75(4.40)
Standard Deviation	.72(.70)	1.00(1.10)	1.02(.94)	.70(8.1)
t-stat (one-way)	-2.89	0.234	0.894	3.60
Significance	.002	.408	.186	.000

DISCUSSION

Implications for Management

Control Variables

Starting with our control variables, Age offers some interesting results – as noted above – that warrant further research. We argued above that with age comes greater experience and so perhaps greater exposure to cultural issues and differences. But, that is an empirical question. While we found the oldest group had higher Total Cultural Intelligence on average than did the youngest group, we also found some counter-intuitive results: (1) some of the lowest TCQ scores of all were found in the oldest group; (2) amongst the youngest group, seven of them scored above 5.000 and the top 23 averaged the same score as the entire oldest group. So, this would appear to be an argument for management to hire older workers, or to search among younger potential hires for those who have had the experiences to increase their cultural intelligence.

For the second control variable, apparently an individual's cultural intelligence does not vary with Gender. At least among these groups of respondents, the cultural intelligence of men and women was the same.

For the last control variable, Country of origin, we found that the French respondents had higher cultural intelligence. Two reasonable explanations are (1) France's proximity to other countries and so the likelihood that the French respondents have traveled more and gained greater cultural intelligence as a result; and (2) the likelihood that there are more international students in the French classroom and so – even though the respondents were limited to French citizens – the French students had a greater opportunity to gain cultural intelligence through interaction with those peers; or perhaps the formal education process at the two universities which address the elements of cultural intelligence differed. From a hiring standpoint, potential employees who have traveled more and interacted more with those from other cultures will more likely have greater cultural intelligence. From a development standpoint, careful integration of employees into cross-cultural teams, and proper management of those teams, could

help employees to improve their cultural intelligence and so do a better job with other employees, customers, stakeholders, *et cetera*.

Openness to Experience

The first of our independent variables of interest is Openness to Experience, and we found the hypothesized positive relationship with cultural intelligence. In seeking to hire and develop employees with greater cultural intelligence, companies should examine – via formal testing (Big Five personality test) or specific related interview questions – the degree to which this personality characteristic might exist. It might also be of interest to examine the degree of international experience such as whether or not the recent university graduate studied abroad, was it in England or Australia, or was it in Senegal or Thailand? For American or even French job applicants, the latter set of countries may suggest a greater openness to experience and so probably a greater cultural intelligence.

Risk Orientation

We found a moderate Risk Orientation to be positively related to Total Cultural Intelligence, as hypothesized. Higher cultural intelligence is a desirable trait even for domestically-oriented firms given the growing multi-cultural nature of the U.S. customer base. It appears, therefore, that companies should hire applicants with a greater moderate risk orientation – those who ran lemonade stands when they were kids or who majored in entrepreneurship – and should institute training programs within their companies to develop a greater risk orientation among their existing staff (what used to be called intrapreneurship (Pinchot, 1985)).

Need for Control

We found a positive relationship between Need for Control and Total Cultural Intelligence, as hypothesized. People who have a need to be in control of a situation are more apt to have a higher cultural intelligence, as knowing more about the situation leaves them feeling more in control of it. Companies may seek to hire or develop employees who have experience in leadership roles.

Implications for Researchers

Control Variables

As we noted above, Age offers some interesting results that warrant further research. We found the oldest group of respondents had higher Total Cultural Intelligence on average than did the youngest group, but also that some of the lowest scores of all respondents occurred in the oldest group and that some of the respondents in the youngest group had very high scores. While the numbers in these groups are small, they do suggest that education or other experiences that come with age may make a difference and future research should attempt to identify these moderating or mediating experiences. This seems a promising line of research for the future.

For the second control variable, apparently an individual's cultural intelligence does not vary with gender. At least among these groups of respondents, the cultural intelligence of men and women was the same. Future research could further test this hypothesis across different respondent traits such as age, and also across different countries.

For the last control variable, Country of Origin, we found that the French respondents had higher cultural intelligence. Again, researchers could investigate this relationship using the U.S. and France but along different respondent dimensions such as age – at what age do the French develop a greater cultural intelligence than Americans; what is it in their experiences that lead to the development of greater cultural intelligence? Are there informal or even formal institutional factors that contribute to this difference?

Openness to Experience

In support of Ang et al. (2006) who tested Singaporean university students, we also found a positive relationship between openness and cultural intelligence in the U.S. and France. Further research could test this relationship in other countries or along other respondent traits. Another line for future research could

be to investigate the relationship directly between various antecedents of openness (e.g., as suggested by McCrae & Costa (1987) and Oolders et al. (2008), curiosity, imagination, artistic ability, breadth of interests, originality) and cultural intelligence.

Risk Orientation

Previous research has not directly tested the relationship between risk orientation and cultural intelligence, so this is a key contribution of this research study. As hypothesized, we found a positive relationship – greater risk orientation is associated with greater cultural intelligence. But, our findings raise an interesting question: France and the U.S. are fairly risk-loving relative to countries such as Russia or Hungary or Guatemala (as found by the GLOBE study of House et al., 2004). Do our findings mean that, on average, Russians and Hungarians have lower cultural intelligence than Americans and the French? This could be a fruitful line of inquiry.

Need for Control

We find a positive relationship between need for control and cultural intelligence. This supports Tay et al.'s (2008) study which used short-term business travelers from Singapore, Brazil, and Israel. To these groups it appears we may now add university business students from the United States and France. To the best of our knowledge these are the only two studies to examine this relationship. Potential future research could focus on respondents who are not in business – the proverbial man/woman on the street, non-business students, working adults in non-business fields, etc.

Caveats

Our study comes with at least four caveats. The first two, the limitation of these two countries and the limitation of these respondent samples, were dealt with earlier in the discussion. Third, is the fact that the R^2 values of our model results are small (but significant). Given the reasonably strong statistical significance of four of the six parameter estimates, this suggests the need to consider whether the model might be under-specified and, if so, what variables might be missing from it. And fourth, is the question of robustness of the findings to different variable operationalizations. The instruments we used to operationalize our independent variables have a limited number of items as we tried to be respectful of the time commitment necessary to complete the surveys given the circumstances in which they were given. Future research using longer survey instruments would test the robustness of the relationships.

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Business Intuition: The Mortar among the Bricks of Analysis

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Intuition is a genuine phenomenon that involves understandings and processes that are non-hierarchical, not based on formal education or years of experience, non-analytic, unpredictable, is quick and easy, and is made without extended conscious deliberation. Managers frequently use their business intuition to direct some part of their decision making and, hence, competitive impact. However, they do not ignore available information or their experiences. Rather, they use both analysis and intuition in their decision making. That is, systematic analysis and intuition are complementary rather than exclusionary, based on what the situation needs to get the best result at the time. This paper defines what is meant by the term intuition and discusses its use and importance in business. Thereafter, the attributes of intuition and of the intuitive manager are presented as well as a discussion of how intuition works. This is followed by ideas regarding how to develop intuition and how to increase the success of business intuition.

INTRODUCTION

"Intuition is a function by which you see around corners." – Carl Jung

Creative thinking involves more intuition or knowing something instinctively. Intuition is a genuine phenomenon, even demonstrated by nonhuman primates (Murai, Tanaka, & Sakagami, 2011) and dogs (Gardner, 2011; Novicevic, Hench, & Wren, 2002). It is easy to see that intuition is part of our biological survival underpinnings going back thousands of years (Nadel, 2011). Intuition plays an important role generally in experts' decision making and thinking (Chassey & Gobet, 2011; Faber, 1999). "There is little doubt that in strategic interaction most parties scrutinize others' behavior carefully and use whatever pieces of evidence they can acquire that seem to signal (validly or not) others' intentions. Yet in many cases, especially in the early stages of an interaction, evidence is slim. This does not halt the wheels of mind-reading, however; in such cases, perceivers arguably reach for a different set of inferential tools." (Ames, Weber, & Zou, 2012) Mikels, et al. (2011) acknowledge that deliberative decision strategies have been considered historically the surest form of sound decisions, however, recent evidence and theory suggest that affective strategies or feelings may be more effective to deliberative strategies for certain complex decisions. While quantitative decision making typically is viewed as being preferable, it can and it does get overridden by intuition. That is, even though intuition is not fully understood, it is an acceptable and commonly used decision-making tool. (Glass, 2008) At the very least, intuition can help every business person with the estimated 170 interactions with others that occur every business day (Wanless, 2002). Business professionals do use intuition. For example, approximately 89% of marketing professionals frequently use their intuition to direct some part of their decision making and, hence, competitive impact. (Keen, 1996) Intuition is an inductive skill, seeing the big picture, and looking at the

whole problem rather than its discrete parts. It can be very useful when data is inadequate or unavailable. At the very least, intuitive thinking is effortless and unaffected by memory and attentional resources. On the opposite side, analytic thinking is more demanding and rapidly degrades with dwindling memory and attentional resources (Gozzi, et al., 2011). But there are negative intuitional biases, too. For example, one bias is that people who use intuition are intellectually lazy and undisciplined in their thinking, relying on gut feelings. On the other hand, intuition can lead to game-changing decision making via a slower and deeper process that requires deliberative reasoning. In general, however, the best thinking in an organization involves the combination of creative and analytic thinking. (*The Business Journal*, 2012) "Confident decision makers blend logic and intuition (of thought and feeling), the so-called two wings that allow leaders to soar (Patton, 2003, 995).

This paper defines what is meant by the term intuition and discusses its use and importance in business. Thereafter, the attributes of intuition and of the intuitive manager are presented as well as a discussion of how intuition works. This is followed by ideas regarding how to develop intuition and how to increase the success of business intuition. All-in-all, intuition and analysis are complementary rather than exclusionary.

INTUITION DEFINED

"It is through science that we prove, but through intuition that we discover."

- Henri Poincare

"Intuition is multifaceted" (Gore & Sadler-Smith, 2011, 304). More specifically, intuition is subconscious, complex, quick, not emotion, not biased, and not part of all decisions (Khatri & Ng, 2000). While many have tried, no one has explained "intuition" satisfactorily. Since intuition has been relatively immune to scientific study and is elusive to define and too difficult to measure, there is a lack of agreement about what intuition is (Sinclair and Ashkanasy, 2005). However, it has been argued that good management practice by business executives should rely more on intuition and less on systematic analysis. This is complicated, however, because intuition has been viewed in different ways: 1) as a paranormal power, sixth sense, or parapsychology; 2) as a personality trait more than likely that is acquired early on and remains relatively unchanged throughout life; 3) as an unconscious process while analysis occurs consciously; 4) as a set of actions that consist of some simple and fairly obvious means of getting and using information; 5) as a distilled experience wherein the manager has previously practiced and chunked various aspects of the decision-making process; and 6) as a residual category or intuition is what is left over after systematic analysis has taken place. Dramatic differences in the conclusions about the advantages and disadvantages of intuition depend upon which of these six conceptualizations is being used as well as speed, information requirements, or quality of choices. (*The Academy of Management Perspectives*, 1991) In general, though, these definitions of intuition seem to fall primarily along two lines: experience-based phenomenon and sensory and affective elements (Sinclair & Ashkanasy, 2005). Here are some additional definitions or aspects of intuition:

- Intuition is "nearly always the surfacing of a submerged memory, a barely noticed event, or some combination of the two. The 'feeling' doesn't come to us over the cosmic ether, but drifts up from our own subconscious." (Dimitrius & Mazzarella, 2008, 227)
- "The situation has provided a cue. This cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition" (Kahneman & Klein, 2009, 520), that is, "unconscious pattern recognition" (Millett, 2011, 56).
- Intuition is "an unconscious process of making decisions on the basis of experience and accumulated judgment. Making decisions on the basis of 'gut feeling' doesn't necessarily happen independently of rational analysis; rather, the two complement each other." (Robbins, 1999, 192)

- Intuition is a "non-sequential information processing mode which comprises both cognitive and affective elements and results in direct knowing without any use of conscious reasoning" (Sinclair & Ashkanasy, 2005).
- Intuition is sudden awareness of knowledge (Kakkonen, 2005).
- Intuition is one's ability to recognize patterns at lightning speed and this often happens unconsciously (Matzler, Bailom, & Mooradian, 2007).
- Intuition is a "question of seeing through things, getting down to what is implicit, uncovering the layer that lies beneath the surface, the things that cannot be expressed directly, in linear language" (Korthagen, 2005).
- Intuition is "(1) quick and ready insight, (2a) immediate apprehension or cognition, (2b) knowledge or conviction gained by intuition, (2c) the power or faculty of attaining direct knowledge or cognition without evident rational thought and inference." (Merriam-Webster, 1999)
- According to Lynn Robinson, author of five books on intuition, intuition is "something we're all hardwired with. I think of it as a compass of our soul, that we really have this information from our divine intuition and that once we pay attention to it, it leads us in the right direction." (Sheehan, 2010, 1)
- Intuition is "heart knowledge." (Neal, 1997, 123) "People who do the most heart work are often behind the scenes" (Glassman, et al., 2003, 364).
- "Intuition is the life force itself, made conscious to us through a feeling that arises from within. Intuition is our human version of animal instinct. Through our intuition we tap the ultimate resource of all – the very source of life." (*Women in Business*, 2002)
- Intuition is soul-sense or spiritual sense that reveals whatever constitutes and perpetuates harmony, enabling one to do good, but not evil (*Christian Science Monitor*, 2008).
- "All good things come from living intuitively. To follow that feeling inside of us we call our intuition is really the only way to fulfill our highest aspirations and deepest needs. Indeed, the intuitive impulse helps us soar…Intuition is the life force itself, made conscious to us through a feeling that arises from within. Intuition is our human version of animal instinct. Through our intuition we tap the ultimate resource of all –the very source of life." (Wanless, 2002, 44)
- The use of intuition is often integrated into decision making. Intuitive thinking is reflexive, heuristic, associative, holistic, experiential in nature, automatic, relatively effortless, tends to be inaccessible to consciousness, rapid, affectively charged, subconscious, and complex. (Shenhav, Rand, & Greene, 2011; Simmons & Nelson, 2006; Dane, et al., 2011; Bower, 2004; Khatri & Ng, 2000)
- Intuition is "a kind of matching game based on experience. There are times when trusting your gut is the smartest move – and times you'd better think twice." (Flora, 2007, 69) Think of intuition as an unconscious associative process. "The brain takes in a situation, does a very quick search of its files, and then finds its best analogue among the stored sprawl of memories and knowledge. Based on that analogy, you ascribe meaning to the situation in front of you…When a new experience calls up a similar pattern, it doesn't unleash just stored knowledge but also an emotional state of mind and a predisposition to respond in a certain way. Imagine meeting a date who reminds you of loved ones and also of the emotions you've felt toward those people. Suddenly you begin to fall for him or her. 'Intuition,' says Linhares, 'can be described as 'almost immediate situation understanding' as opposed to 'immediate knowledge.' Understanding is filled with emotion. We don't obtain knowledge of love, danger, or joy; we feel them in a meaningful way." Flora, 2007, 70)
- "Intuition actually means, 'in-tuition,' or learning and being educated from inside ourselves. Only when we are following the wisdom of our inner feelings, which may be expressed in a vision, thought, voice or hunch, are we authentic. Then we are a genuinely self-led person." (Wanless, 2002, 46)

In general, there seem to be three commonalities surrounding the use of intuition, i.e., it originates beyond consciousness, information is processed holistically, and intuitive perceptions are frequently accompanied by emotion (Sinclair & Ashkanasy, 2005). As such, it appears that intuition is an inner, direct knowing or focus. In fact, it seems that intuition is an aspect of conscious awareness. More specifically, intuition is the self-awareness of direct knowledge. That is, intuition says "I feel or see or experience this in me directly...I am directly aware of this in me...it belongs to me." The key is awareness, awareness of what something inside oneself is saying to oneself. As such, intuition is self-reading of one's own truth or understanding. This capacity is very compatible with the idea that managers typically are viewed as having a high degree of empathy. Intuition requires that one master one's own direct and often subtle knowing or experience, both seeing it and understanding it. In order to master intuition, one must first master direct knowing.

IMPORTANCE AND USE OF INTUITION

"Often you have to rely on intuition." – Bill Gates

Managers make challenging and important decisions every day. Approximately 32% of managers are intuitive, and intuition is positively related to organizational effectiveness (Andersen, 2000). Six in 10 or 62% of CEOs indicated that gut feelings are highly influential in guiding their business strategies, while only four in 10 indicated that internal metrics and financial information (44%) or competitor analyses (41%) are highly influential (*Business Wire*, 2006). That is, intuition seems to be a characteristic of many managers in general, and more specifically, the combination of intuition as dominant and thinking as the auxiliary function is quite often found in managers (Andersen, 2000). In addition, entrepreneurs have a greater propensity for intuitive decision making (La Pira, 2011). However, they do not ignore available information or their experiences. Rather, they use both analysis and intuition in their decision making. That is, entrepreneurs tend towards self-sufficiency, trusting their own judgment (self-efficacy), living with ambiguities and uncertainties, and being willing to make decisions even though they do not have all the information they need at hand. "When outcomes are difficult to predict through rational means and they need to make a decision, they respond in a pragmatic way by utilizing their intuitive judgment and making a decision." (La Pira, 2011, 11) While rational analysis is useful, it is not a panacea for decision-making. Rather, it is like the bricks of a wall with intuition being the mortar. That is, systematic analysis and intuition are complementary rather than exclusionary, based on what the situation needs to get the best result. (Vasconcelos, 2009) "Intuition enhances thoughtful decision-making, it doesn't replace it" (Smart, 2009). In fact, intuition even can play an important role in determining how to perceive, approach, and respond to a business situation or problem. Even managers who stress analytical processes actually mix intuition into most decisions (Kutschera & Ryan, 2009).

> "Intuition is a brain skill that can be particularly useful as a tool in decision-making when a manager is faced with a crisis or emergency situation, where new trends are emerging differently from past patterns, and where data is inadequate, unavailable, or inappropriate for the particular situation at hand. Many leading executives readily admit to relying on intuition to make some of their most successful decisions, and recent research has indicated that the ability to use intuition is positively correlated with a higher profit record when chief executive officers performance in the private sector is compared." (Agor, 1985, 16)

In addition, intuition or understanding without apparent effort works well in some realms while still needing some restraint and checks in others (Mundy 2011). Intuition tends to be used in non-routine decisions or when faced with conflicting facts or inadequate information, e.g., future projections, crises, pulling discordant facts together, and problem solving (Agor, 1985; Jennings, 1999). However, for routine decisions, business leaders are five times more likely to apply analytics rather than intuition across

the widest possible range of business decisions; and, two times more likely to shape future business strategies and guide day-to-day operations based on analytics (Meinert, 2011). Intuition also tends to be used when the perceived importance and potential impact of a decision is high, i.e., life or game altering decisions or high-stakes decision making. (Sinclair and Ashkanasy, 2005; Flora, 2007; Kutschera & Ryan, 2009) It has been used "to identify problems, to streamline routine jobs, to pull isolated facts together, to balance purely logical analysis, and to solve problems faster." (Jennings, 1999, 44) Intuition also can help one to be calm in the midst of change and chaos, it can give insight into the people around us, and it can help make successful decisions in all areas of life (Sheehan, 2010). Intuition allows us to speed-sort information and to make connections before reason can assemble the data (Oliver, 2007). For example, "The only way to evaluate character is free and takes hardly any time at all. The method is the informal skill known as (intuition). Executives all possess this skill to some degree or other and use it constantly in other contexts." (Thompson, 2005, 37) In general, executives found intuition to be most helpful and most frequently used under condition of: uncertainty, no previous precedent, when variables are not scientifically predictable, when facts are limited, when facts do not clearly point the way to go, when analytic data is not useful, when several good and supportable alternatives exist, and when there is time pressure to come up with the right decision (Agor, 1990). Additionally, it has been applied successfully to job interviewing, employee selection, social exchange, investing and loan decisions, healthcare decisions, the athlete selection process, new product development, and drug discovery research (Forsyth & Bradbury, 2011; Blume & Covin, 2011; Sundgren & Styhre, 2004; Lodato, 2008; Luo & Cheng, 2006). Also, "Jazz encodes the paradox of intuition: The ability to improvise is born from a lifetime of discipline, including copying solos from favorite musicians to internalize the natural flow of music" (Flora, 2007, 73). It is interesting that even though intuition is so valuable, executives often try to keep it a secret and hide it, afraid that their colleagues would not understand (Agor, 1990).

In summarizing the use of business intuition, Glass (2008, 95) states the following:

- "Quantitative decision making, when it really works, is usually preferable to its alternatives, but it doesn't work as often as we would like.
- "Rational decision making is a good second choice, but it often gets overridden in practice by something else.
- "That something else is intuition, and even though we don't understand it, it's an acceptable, commonly used decision-making approach."

Additionally, Kutschera and Ryan (2009) suggest that intuition be added into a systematic decision process, e.g., 1) define criteria for success or failure, 2) remain focused on the problem at hand, 3) remember that good information is gathered from many different sources, 4) balance calculated risks with intuitive judgment, and 5) change the question to test an analysis.

THE ATTRIBUTES OF INTUITION AND THE INTUITIVE PERSON

"I rely far more on gut instinct than researching huge amounts of statistics."
–Richard Branson

The attributes of intuition can be described as follows: non-hierarchical, not based on formal education or years of experience, non-analytic, what to do is known before why we are doing it, unpredictable, does not conform to rules and regulations, does not rely on senses, is quick and easy, made without extended conscious deliberations, may reflect automated expertise, random inconsistency may occur, systematic distortion may occur, works alone and beyond ambiguities, is not limited to time and space, synthesizing seems to occur, based on one complete picture, not arbitrary, not irrational, goal directed, simply responds to questions, can be based on some form of impressions or symbols, may have great heuristic value, and may come in the form of a series of questions or a dialog with the world, i.e., one impression may suggest others. (Day, 1996; Beh, 1993; Schoemaker & Russo, 1993; Rosanoff, 1998; Earlenbaugh & Molyneux, 2009; Bolte & Goschke, 2005) Cappon (1993) offers that skills needed for

intuition to occur include: perceptual closure on insufficient time, perceptual closure on insufficient definition, perceptual recognition, positive perceptual discrimination, negative perceptual discrimination or what was not there in the intuition, synthesis or Gestalt insight, time flow estimation, retrieving of memory or quick memory, passive imagination, psycho-osmosis or knowing the unknown, active imagination, anticipation or foresight, optimal timing of intervention, hunch or seeing the solution to a problem before you have it, choice of best method, choice of best application of a discovery, hindsight that uses empathy and identification in order to divine the cause of things, associative and dissociative matching, and seeing the meaning of things.

The intuitive is crucial to the process and quality of intuition. Intuitives tend to find and use information that is beyond their senses, i.e., imagination, inspirations, and subtle impressions. They look at the big picture to grasp essential patterns, asking "why not" rather than "why" (Millett, 2011). They are experts at unconscious pattern recognition, seeing new possibilities and new ways of doing things. They often see the possibility and works backwards to assess the resources, investments, and actions needed to implement the dream (Odom and Pourjalali, 1994; Millett, 2011). Additionally, the intuitive places high value on ideas, innovation, concepts, theory, and long-range thinking. This individual is a knowledgeable, future-oriented person who likes to abstract principles from a mass of material. The intuitive can usually be described as original, creative, broad-ranged, charismatic, idealistic, intellectual, tenacious, ideological, and involved. On the other hand, he or she may be unrealistic, far-out, fantasy-bound, scattered, devious, out-of-touch, impractical, and a poor listener. So, the specific choice of intuitive is very important. (Futtrell, 2011)

> "What is so special about intuitive talent? Extensive research on brain skills indicates that those who score as highly intuitive on such test instruments as the Myers-Briggs Type Indicator tend to be the most innovative in strategic planning and decision making. They tend to be more insightful and better at finding new ways of doing things. In business, they are the people who can sense whether a new product idea will 'fly' in the marketplace. They are the people who will generate ingenious new solutions to old problems that may have festered for years. These are the executives that all organizations would love to find." (Agor, 1989, 21)

Mavor, Sadler-Smith, and Gray (2010) add that the intuitive is self-confident, client-centered, gives him/herself permission to access and use intuition, listens to his/her body, is mentally and physically prepared, is disciplined, focused, and organized, is responsive to challenges in the moment, seeks permission from the client to use intuition, establishes and maintains rapport with the client, is unattached to his/her intuitions, is objective about his/her intuition, and is courageous in his/her engagement with intuition.

Eugene Sadler-Smith (2010), author of *The Intuitive Mind* explains the two minds model with regard to the integration of intuition and the intuitive:

> "The two minds model is widely used in psychology (where it goes under the name of dual-process theory) – and it means precisely what it says: we have one brain but "two minds," an analytical mind and an intuitive mind. They co-evolved in the human species in order to fulfill particular functions, and without both of them we would be unable to function effectively in the real world. The analytical mind is a "narrow band-width" processor – it's the cognitive heavyweight of the two, able to solve problems in a logical step by step manner using all the available data. However, one of the drawbacks is that in many real world situations there may not be sufficient data available (or there may be too much data) to make sense of and there may not be the luxury of time to weigh up all the pros and cons of a situation. In this situation, experienced decision makers are often able to cut through a mass of detail or interpolate quickly and effortlessly and come to quick and often, but not always, accurate decisions. One of the distinctive attributes of the intuitive mind is that, although it can do very complex parallel processing, it cannot 'talk' to us in words in the same way that

the analytical mind can. So the intuitive mind has evolved a different method to communicate to our conscious mind what it 'thinks' we should do – its voice is the language of feeling (by the way not the same thing as emotions – intuitive feelings are different to emotional feelings). Experienced intuitive experts have learned to trust what their gut is telling them, it may not always be right but for many people its right more often than it's wrong." (Norton, 2010, 39)

HOW INTUITION WORKS

"I believe in intuitions and inspirations...I sometimes FEEL that I am right. I do not KNOW that I am." – Albert Einstein

Determining the linkages between intuition and its outcomes is ambiguous and hard to measure. Hence, determining how intuition works is even harder. It is known that individuals are more confident in their final decisions when they choose the intuitive option as opposed to the non-intuitive alternative. Also, individuals often choose to follow their intuition even when other information undermines their intuition's validity (Simmons & Nelson, 2006). This is probably because unconscious processing involves the rapid detection and assessment of survival patterns in the environment that may be threatening to survival or provide an opportunity to enhance survival (Hayes, Allinson, & Armstrong, 2004). While it is not clearly known how intuition works, Day (1996, 174-175) offers:

> "Like your other senses, your intuition is first and foremost a survival tool. It's geared to give you data instantaneously. When our day-to-day survival was more precarious, an individual's life or death depended very much on how tuned in he or she was to the surrounding environment. Those who were most intuitive had a far better chance to survive.
> "Most of your life questions related in some way to the future, and intuition, being foremost a survival skill, is especially adept at addressing the future. Most likely it's the sense (or collection of senses) specifically geared to gathering information that is not available in your immediate environment."

Prietula and Simon (1989, 122) view intuition as being based on cognitive functioning: "How does intuition work? Long experience leads to chunking, so that familiar patterns emerging in a situation immediately suggest a possible move, a possible condition (medical diagnosis), or a possible risk (finance)...intuition...is a sophisticated form of reasoning based on chunking that an expert hones over years of job-specific experience."

Horstmann, Ahlgrimm, and Glockner (2009, 350) have found that

> "Instruction to deliberate does not induce qualitatively different information processing compared to instructions to decide intuitively…our findings suggest a very similar basic process underlying intuitive and deliberate decisions, namely an automatic process of information integration…automatic information integration plays a crucial role in decision making, independent of whether people decide intuitively or deliberately."

Another description of the workings of intuition is offered by Tesolin (2000). Beyond emotional intelligence lies the possibility of intuitive intelligence which is closely aligned with common sense. Intuition involves a deep level of self-knowing. "A deeper level of self-knowledge creates an energy reservoir that is capable of producing a desired outcome almost instantly by directing one's desire and intention." (Tesolin, 2000, 76)

Sauter (1999) acknowledges six forms of intuition wherein each works and displays differently:

1. Illumination: A sudden awareness of information.

2. Detection: Usually occurs when the mind is focused toward something other than problem solving.
3. Evaluation: Facilitates choice among alternatives, i.e., that option feels right or does not feel right.
4. Prediction: Involves developing hypotheses without first analyzing data.
5. Operative intuition: Guides and provides a sense of direction or pinpoints events.
6. Creative intuition: Supplements detection by generating ideas.

Sinclair and Ashkanasy (2005, 354) view intuition as "an integrated model of analytical and intuitive decision making where both approaches are used in a complementary and iterative fashion; and the dominance of either approach is determined by dispositional and contextual factors." That is, decision makers tend to use intuition in conjunction with rational analysis, but it is personalized by individual and situational factors.

Inbar, Cone, and Gilovich (2010, 232) describe the inner workings of intuition as follows: "People are cued by the features of the decision problem to follow intuition or reason when making their choice. That is, when features of the choice resemble features commonly associated with rational processing, people tend to decide on the basis of reason: when features of the choice match those associated with intuitive processing, people tend to decide on the basis of intuition." However, Dane, et al.'s (2011) research seems to contradict this idea by acknowledging that the problem-solving approach and individual differences in thinking style interact in a way that creativity is highest when individuals use a non-typical problem-solving approach. For example, they contend that individuals who typically think rationally may benefit from an intuitive or nonstandard cognitive problem-solving approach and from an environment where natural tendencies are left behind.

Despite these many descriptions of how intuition works, there seem to be two main categories of theories about how intuition works: the mechanistic and the nonmechanistic theories. The mechanistic theory or Simon's Theory attributes intuition mostly to pattern recognition and the acquisition of chunks associated with relevant knowledge about the decision area. The nonmechanistic theory or Dreyfus and Dreyfus Theory emphasizes the holistic nature of experts' cognitive processing and acknowledges five stages moving from novice to expert, i.e., "from conscious, analytic, and deliberate behavior that depends heavily on instruction to intuitive and fluid behavior that naturally fits the requirements of the environment." (Chassy & Gobet, 2011, 200)

So, there has been some disagreement about how intuition works…maybe akin to blind men describing an elephant, i.e., one "sees" a bottle brush, another a tree trunk, another a hose, another a spike, etc., depending upon one's perspective. "By saying 'yes' to intuition we open up a lot of doors for greater success and creativity. By learning how intuition occurs for us we gain command of our abilities to recognize it as more than a fleeting experience. Then, once we understand what it's telling us, we can move on to even greater things." (Tesolin, 2007, 78)

HOW TO DEVELOP THE INTUITION

> *"At times you have to leave the city of your comfort and go into the wilderness of your intuition. What you'll discover will be wonderful. What you'll discover is yourself."*
>
> – Alan Alda

"Intuition can be refined over time" (Smart, 2009). Additionally, intuition is economical and well worth developing (Tesolin, 2007). However, even though intuition is used widely, it can have a reputation of being unscientific, of having mixed results. "Even among highly intuitive executives, considerable opportunity exists for honing and developing their skills" (Agor, 1990, 169). In general, educational institutions give little attention to how to develop intuition implying that it is not highly valued. Rather the opposite, effort has been given to showing that intuitions systematically ignore important information and that judgments can be improved when individuals are pressed to reason more carefully. (Lieberman,

2000; Sadler-Smith & Burke, 2009) However, "Most employees and managers today are accustomed to an environment that does not encourage intuition. Becoming intuitive takes practice. Include developing intuition capabilities in your competency plans. Decide how and where you want your staff to be intuitive, and develop learning and training plans from there. Make sure you consult and exchange ideas with your staff about this initiative." (Tesolin, 2007, 77) "Analytics can never trump the intuition of a thoughtful executive, wrought by years of experience and accumulated knowledge, tempered by emotional intelligence" (Matzler, Bailom, & Mooradian, 2007, 15). Additionally, Matzler, Bailom, and Mooradian (2007) reveal that the development of intuition requires: experience, networks for sharing experience, emotional intelligence which works faster than intellectual intelligence, tolerance for both positive and negative experiences, curiosity for discovering new opportunities, and limits so that intuition is not taken to extremes. Kerfoot (2003) offers four guidelines to help leaders continue to develop their intuitive skills: practice, practice, practice; learn to listen by crafting the fine art of focusing; tell stories to free up your imagination and do postmortems to learn from experience; and breed gut thinkers in your organization by eliminating barriers and providing opportunities.

Jennings (1999) offers the following suggestions for developing intuition:

- Use wordplay with metaphors and analogies.
- Use clay, pipe cleaners, or some other kind of representational material to build models.
- Find new approaches to a problem by carefully studying pictures that may seem at first glance to have no logical connection to it.
- Involve the body in vigorous physical exercise that makes analytical thinking harder, but promotes awareness and sensitivity.
- Listen to certain kinds of music like Mozart to enlarge neural pathways that stimulate learning and creativity.
- Incubate your dreams to help solve complex problems. That is, concentrate on the key problem before you go to sleep, then write down your dreams and use these clues to solve the problem.
- Use relaxation, breathing, and meditation techniques (Wise, 2000). "Executive meditators reported using their intuition in the preponderance of their decisions…They reported their intuition is more accurate following meditation." (McNaughton, 2003, 1)
- Ask your intuition open-ended questions such as "How do I…," "What do I need to know and understand about this problem," etc. Pay attention to any images, feelings, sensations, impressions, etc., that you get.
- Brainstorm. At the end of 10 minutes, pay attention to what choices feel best. Notice what you get excited about. Act on the information you get, take small steps first. (Sheehan, 2010)

Is it worth developing intuitive skills? As stated by Agor (1989, 23),

> "The management climate of the future will place an increasing premium on intuitive skills in the strategic-planning and decision-making process. Furthermore, we will probably learn more in the next decade through ongoing brain research about how to use and expand intuitive skills than we have thus far in the history of mankind. These factors together suggest that devoting organizational time and resources today to develop intuitive brain skills will likely offer dramatic payoffs in the future in terms of increased productivity and better strategic planning and decision making."

Intuition is an innate skill available to everyone who chooses to listen to their intuitive messages. It is easily developed and definitely improves with use. (Mara, 2003) "It is possible for individuals to develop high levels of intuitive knowledge, and to develop the ability to apply intuitive decision policies consistently" (Trailer & Morgan, 2004).

INCREASING THE SUCCESSFUL USE OF INTUITION

> *"It is always with excitement that I wake up in the morning wondering what my intuition will toss up to me, like gifts from the sea. I work with it and rely on it. It's my partner."*
>
> – Dr. Jonas Salk

If intuition is based on reasoning experience and astuteness, then it follows that intuition can be learned and improved. Dimitrius and Mazzarella (2008) offer a simple approach for amping up one's intuition:

- Recognize and respect your intuition, not following it blindly or rejecting it outright.
- Identify what your intuition is telling you. Follow the hunch, asking what is it?
- Review the evidence by playing back the events in order to become more conscious of the signs.
- Prove or disprove your theory. Gather additional information to consciously test your theory.

The following suggestions for successfully using intuition are added (Dimitrius & Mazzarella, 2008; Tesolin, 2007; Smart, 2009; Sauter, 1999; Raskin, 1988):

- Trust yourself. Work to diminish the fear of using intuition. (Cartwright, 2004)
- Train yourself. Start small and work up. Use external feedback in training. "Managers need tools to assist in generating intuitive thoughts and to verify the intuition once it occurs" (Sauter, 1999, 115).
- Ask the right question(s). Ask many questions to cover the possibilities.
- Make sure it is intuition and not just make believe. Keep a connection with reality. Keep your ego and personal filter out of the process. As noted by De Neys (2012, 28), "…although intuitive heuristics can sometimes be useful, they often cue responses that conflict with traditional logical or probabilistic normative principles and bias our decisions."
- Add it to good decision making -- not to replace it. "People make different decisions depending on whether they adopt systematic processing or rely on intuitive, heuristic processing" (Alter, et al., 2007). Use both analysis and intuition. "Experience is encoded in our brains as a web of fact and feeling" (Flora, 2007, 70). For example, individuals thinking rationally may benefit from using an intuitive problem-solving approach when generating creative ideas. It should be noted, however, that individuals often choose to follow their intuitions even when other information undermines their intuition's validity. In addition, intuitive choices increase when intuitive confidence increases. (Dane, et al., 2011; Simmons & Nelson, 2006; Smart, 2009; Inbar, Cone, & Gilovich, 2010)
- For successful intuition, a certain acceptance is needed that one cannot adequately or completely control situations or rationally understand them (Korthagen, 2005).
- Intuition is more likely to be flawed in unknown, uncertain territory and in conditions of high stress. However, uncharted territory often lacks the stepping stones of analysis and requires the gut tactic of intuition. Using an intuitive system is fast but there may be more errors and biases. So, what may be needed is intuition guided by critical thinking. (*The Business Journal*, 2012)
- Add intuition to team work. However, honor others' intuitive abilities or lack thereof. For example, custom build a team of intuitives and analytics to manage future projections, crises, and problem-solving (Agor, 1985; Dayan & Benedetto, 2010; Dayan & Elbanna, 2011).
- If something does not work, keep trying. Intuition may be better in some areas than others. Remember, like building muscles, intuition can be greatly developed through practice (Wanless, 2002). (Millett, 2011)
- Cultivate intuition by reading books about intuition, interacting with intuitives, and keeping an open mind. Self-reflect on its use and grow from your self-reflection. For example, keep an intuition journal where you record experiences, insights, and ideas (Tesolin, 2000).

- Intuitive signals are clearest when stress, overburden, fear, pain, boredom, and fear of failure are minimized; and, silence and relaxation are maximized. Do nothing for five minutes every day, use this to slow down and become more self-aware and joyful. (Tesolin, 2007; Glaser, 1995) For example, Tesolin (2000) suggests that 5-10 minutes a day of meditative or self-awareness training can make a substantive difference. He also acknowledges that good intuitive practices fill you with energy and a sense of power while bad practices raise doubt and other negative feelings.
- If an individual is getting mixed intuitions, then step back from the situation. Take a time out and just be still and in a receptive mode until the intuition is clear. (Smart, 2009)
- Right-brain skills such as intuition can be practiced and successfully used to empower managerial decision making (Agor, 1985). But, integrate them with left-brain skills in order get the whole picture.
- Avoid a gut reaction based on minimal facts. Rather, make a gut decision once facts are collected and interpreted. Do not allow yourself to be forced to make a decision when fact-finding is insufficient. On the other hand, pay attention to ideas, insights, and impressions that seem to come out of nowhere or out of the blue. The balance of these two aspects leads to superior decision making. (Nadel, 2011)
- Give yourself some time. Reserve a few minutes to think through your intuition. Review what your gut is telling you. Say it out loud and see how it sounds. (Stettner, 1998)
- Bad decisions often can follow from not following intuition. Failure to be honest and to remain detached can lead to poor decisions. In addition, projection can distort reality and lead to ineffective decisions. (Agor, 1990)
- Individual differences in intuitive processing style do exist and play an important part in intuitive decision making. For example, mistakes are likely to be made when the decision maker overuses heuristics or a solution that works for one situation but not for others. (Hicks, et al., 2010)
- Intuition requires a great degree of self-knowledge, deep listening, and stepping outside one's conditioning. "Geniuses, shamans, mystics, and visionaries throughout the ages have been able to access non-ordinary states of consciousness for direction, power, and wisdom…The 21st-century mind needs to operate on a multidimensional front." (Tesolin, 2000, 76)
- "Not every intuitive decision you make will be the right choice from an outside point of view. Being 100 percent right does not happen, but 100 percent correct does if your choice comes from your heart of hearts. And if you follow the feelings that give you the greatest positive charge of energy, then, at the very least, you are utilizing all of your inner resources with utmost conviction and, therefore, giving yourself the greatest chance to succeed. When following your intuition, you are in your own place of power. Intuition is personal, and that is why it works for you. But remember, what is correct for you, may not be for another." (*Women in Business*, 2002)
- Be careful to not dismiss early warning signs, feelings, or gaps. One must learn to work with intuition so as not to regret in hindsight. That is, listen to what is said and not said, to when things do not fit, to missing or conflicting information, and to the whole story. (Tesolin, 2000) It is ok to listen to the gut feeling at the beginning, rather than at the end of the process (Oliver, 2007). However, be careful that you are not misreading an emotional impulse (Stettner, 1998).
- The trustworthiness of intuition also is contingent upon the environment in which the judgment is made and of the opportunity to learn regularities of that environment. For example, a high validity environment is needed for the development of skilled intuition, i.e., there are stable relationships between objectively identifiable cues and subsequent events or outcomes of possible actions. It is best to be relaxed and confident about one's intuition and choices. (Kahneman & Klein, 2009; Agor, 1990)

The successful use of intuition is important to the manager and the organization. As businesses increasingly become continuously learning organizations (CLOs), successful intuition will grow in importance and be consciously developed within the organization.

> "There is no denying that rationality, analysis and linearity will continue to be vital contributors to decision making, problem solving and organizational development. However, given the evolution of the business environment, we believe that CLOs are the form of organization best adapted to producing efficiency, effectiveness and profits. We have argued that the use of right-brain skills such as intuition must be recognized and developed in order to create a CLO successfully. Corporations which are able to tap the full range of human capability are bound to have a sustainable competitive advantage." (Lank & Lank, 1995)

CONCLUSION

> *"Intuition and concepts constitute...the elements of all our knowledge, so that neither concepts without an intuition in some way corresponding to them, nor intuition without concepts, can yield knowledge."* - Immanuel Kant

Individuals, decision makers, and managers engage in analytical thinking and intuition virtually all the time (Kutschera & Ryan, 2009). That is, intuition is a valuable skill for any manager. In fact, it seems that the "leader needs both skills, and more information is pointing to the ability to utilize intuition as the defining separation between great and average leaders" (Kerfoot, 2003, 253). In particular, intuition is useful in crisis or emergency decision making situations, when dealing with new trends, and when data is inadequate, unavailable, or inappropriate for the problem at hand. In general, the best thinking in an organization involves the combination of creative and analytic thinking. "Good leaders have a humble confidence and surround themselves with both a creative and analytic think team. They trust their gut but follow a rigorous and deeper analytic process to get to clearer and better decision-making" (*The Business Journal*, 2012, 5). That is, "Successful strategic planning requires the effective integration of analysis and intuition" (McGinnis, 1984). This paper has defined what is meant by the term intuition and has discussed its use and importance in business. Thereafter, the attributes of intuition and of the intuitive manager were presented as well as a discussion of how intuition works. This has been followed by understandings and suggestions about how to develop intuition and how to increase the success of business intuition. "Intuition is bigger than we realize. It feeds our expertise, creativity, love and spirituality. It is a wonder. But it's also perilous. Today's cognitive science aims not to destroy intuition but to fortify it, to sharpen our thinking and deepen our wisdom. Scientists who expose intuition's flaws note that it works well in some areas, but needs restraints and checks in others. In realms from sports to business to spirituality, we now understand how perilous intuitions often go before a fall, and how we can therefore think smarter, even while listening to the creative whispers of our unseen mind." (Myers, 2002, 52)

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Policy Awareness, Enforcement and Maintenance: Critical to Information Security Effectiveness in Organizations

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To minimize the probability of costly information security incidents, organizations should be highly motivated to communicate, enforce and maintain security policies. With insight from the workplace deviance and organizational learning literature, we investigate a model exploring the impact of policy awareness, enforcement and maintenance on the effectiveness of information security programs in organizations. Utilizing a sample of 297 certified information security professionals located in the United States, we found support for the model as well as a second-order version of a modified structure. Before concluding, we discuss our results, study limitations and offer implications for research and practice.[1]

INTRODUCTION

Frequent media reports of major data breaches, such as the 2011 Citibank and Sony incidents where hackers accessed millions of customer accounts, has highlighted the critical need for businesses and governments to strengthen information security programs. Organizations should assess all possible threats and weaknesses when evaluating their information security risks. Secure business processes are central to controlling corporate information and preventing a rogue employee, for example, from anonymously giving sensitive information to a competitor or a site like Wikileaks. Key in this regard is the importance for organizations to develop and maintain sufficient security policies and ensure employees are aware of them. The desire to eliminate security breaches which, if publicized, can damage an organization's reputation should be a strong incentive to tighten internal policies. Organizations with sensitive information need formal policies that are actively maintained, updated and properly communicated to employees to prevent such incidents (Knotts, 2011).

Digitized information is the lifeblood of modern organizations that are increasingly reliant on technology to conduct everyday operations. Due to this digital dependence, information security programs have become essential to protecting sensitive information. Likewise, policy is critical because it sets the rules and expectations about how employees are to behave when handling information and using computer systems. Organizational policy must balance the need for security with the requirement for accessibility to these systems. In other words, excessive security can restrict the access and handling of information that may hurt profitability and work against achieving business goals. Likewise, too little security increases the risk of an incident resulting in compromised information, competitive disadvantage,

lawsuits and damaged reputation. An organization's information security policy is a vital business document that must address this delicate balance and ultimately promote security effectiveness.

Our study addresses the essential elements of security policy management and their relationship to overall security effectiveness in organizations. In the rest of the paper, we provide a literature review of information security policy as a basis for our theoretical model and hypotheses. We then describe our research methodology and share the results. We conclude with a discussion of our findings and their implications and offer suggestions for future research.

THEORETICAL MODEL AND HYPOTHESES

Security policies are a critical safeguard to help employees understand how they need to behave in regards to protecting organization information and systems. The prevailing literature on organizational policy offers a foundation for the information security field. An internal policy is a general rule or expectation that limits the discretion of employees in an organization (Simon, 1957). It may be considered a plan of action or set of expectations for employee behavior when confronted with a specific set of circumstances that is addressed in the policy. Some believe that policies should evolve over time and be adapted to or derived from operating decisions as a response to repetitive situations (Ansoff, 1965; Wrapp, 1967). From a general deterrence framework, security policy depends on the same core mechanisms as societal law in that organizational policies clarify what is deemed unacceptable versus acceptable conduct as well as the appropriate punishment for illicit behavior (Lee & Lee, 2002). In regards to information security, policy addresses the integrity, availability, and confidentiality of data stored and transmitted between information systems and is necessary before implementing effective deterrents (Straub, 1990). Managing information security policy in organizations involves a cyclical process of activities to develop, implement, communicate and enforce approved policies while performing regular risk assessments to maintain established policies (Knapp, Morris, Marshall, & Byrd, 2009).

Information Security Program Effectiveness in Organizations

In our research model, we measure *effectiveness* to capture whether an information security program is accomplishing its objective of protecting information in the organization. This is a useful measure because with the increasing attention and spending on information security, organizations should know if their security programs are working. We titled the dependent variable of our study *information security program effectiveness*. While published *information system* effectiveness studies exist in significant numbers, few studies with a comparable *security effectiveness* variable exist in the research. Straub (1990) measured computer abuse using qualitative and quantitative items with criminal sociology as a field of reference. A different study used a perception variable of security effectiveness with participants responding to overall security deterrence, prevention and protection levels of computer hardware, software, data, and services (Kankanhalli, Teo, Tan, & Wei, 2003).

Security effectiveness can be challenging to measure, because it is nearly impossible to know if hard data such as the number of incidents or the amount of financial loss is accurate and complete. Moreover, organizations face potential financial losses by publically reporting security incidents due to reputational damage, reduced consumer confidence and stock price decreases. Thus, a financial incentive exists not to report security incidents or to deliberately underreport them. Furthermore, security incidents may not even be detected at all or go only partially detected (Richardson, 2003). As a consequence, research subjects may not be forthcoming in providing hard numbers about security incidents or in admitting general ineffectiveness due to the sensitivity of security matters (Kotulic & Clark, 2004).

Our dependent variable measures how effectively the organization's information security program protects the company's information resources and whether the program is achieving its security goals. Rather than collecting hard numerical data, we measure effectiveness using the professional judgment of certified security specialists. Furthermore, to address the wariness that respondents may have regarding answering effectiveness and policy management questions, we used a survey instrument developed

specifically to not sound meddling or excessively intrusive. We discuss these efforts in the methodology section.

Having identified our dependent variable, we now review the independent variables of our model. In the next segment, we discuss information security policy awareness. Next, we reference the workplace deviance literature in regards to the policy enforcement variable. Finally, we cite the organizational learning literature in formulating the policy maintenance variable.

Policy Awareness as Vital to Effectiveness

In the current context, awareness is a general state of employee knowingness or mindfulness about security concepts. Awareness represents a user's raised consciousness and understanding of security issues and strategies of how to deal with them (Dinev & Hu, 2007). Examples of awareness enhancing activities include security briefings, formal training, regular reminders, ethical codes of conduct as well as the promulgation of organization policy describing the appropriate use of system resources (D'Arcy, Hovav, & Galletta, 2009; Parker, 1981).

The notion of awareness is often interchangeably used with training and education; the terms are frequently mentioned together such as in reference to security education, training and awareness (SETA) programs (Bulgurcu, Cavusoglu, & Benbasat, 2010; D'Arcy, Hovav, & Galletta, 2009). Regardless of the term, the goal of awareness and training programs is to enhance knowledge of corporate policies and improve employee security behavior in organizations. It is common practice for organizations to train employees about handling security threats and encourage employees to support security policy in the course of their daily work (ISO/IEC, 2005). This is vital because the human worker is the endpoint of an information system and considered the weakest link in protecting organizations from both external attackers and internal security violations (Hu, Xu, Dinev, & Ling, 2011; Warkentin & Willison, 2009). General awareness of security risk is understood to be fundamental to effective information security (Spears & Barki, 2010). For developing corporate security policies, some suggest that deterrence against violations should be articulated clearly in policies, and firms should ensure that employees are fully aware of the consequences of violating policy (Dinev & Hu, 2007). Similarly, security-aware employees who are knowledgeable about policies translate to a more secure organization. Thus, we hypothesize that:

> *Hypothesis 1: Information security policy awareness is positively associated with information security program effectiveness.*

Policy Enforcement as Minimizing Workplace Deviance

In a sociological context, *general deterrence* assumes that people will engage in negative behaviors if they do not fear punishment. Policies, norms, laws and their enforcement are intended to create awareness that negative behaviors will be detected and violators appropriately punished (Keel, 2005). The related concept of *social deviance* is defined as normative violations especially where breaches of norms risk serious sanctions (Best, 2006). Within organizations, workplace deviance refers to voluntary employee behavior or condition plainly different from the norm that can be a prevalent and costly problem for organizations and its members. (Aquino, Galperin, & Bennett, 2004). Workplace deviance is commonly divided between *interpersonal deviance* which targets individuals such as by gossip or theft from coworkers and *organizational deviance* such as by damaging company property or intentionally working slowly (Berry, Ones, & Sackett, 2007). In regards to security policy, workplace deviance can manifest itself in employee disobedience toward official policy by, for example, providing a whistle-blower site with confidential company information. To help minimize deviance, general deterrence aims to reduce the probability of negative deviant behavior in employees through controls such as organization security policy, which sets to establish what constitutes deviant behavior coupled with awareness of the punishments for violating policy.

Organizations can promote awareness of punishments by enforcing approved policies. If an employee knowingly violates a policy, the company can enforce it by appropriately reacting to the deviant behavior. The act of enforcement may promote employee observance of official policy and encourage employees to

respect corporate policies through their behaviors and daily activities. If an employee deviates from policy, the organization can enforce it through punishments such as an official reprimand, monetary penalty, job demotion, work suspension or job firing. In the context of organizations, general deterrence theory predicts that the greater the certainty and severity of punishment for a deviant or illicit act, the more employees are deterred from such acts (Gibbs, 1975). The effectiveness of policy awareness on employee perception of punishment severity is key because it can be a preventive influence to deviant acts targeting information systems (D'Arcy, Hovav, & Galletta, 2009) and thus advance information security. We suggest the following:

> *Hypothesis 2: Information security policy enforcement is positively associated with information security program effectiveness.*

Policy Maintenance as Organizational Learning

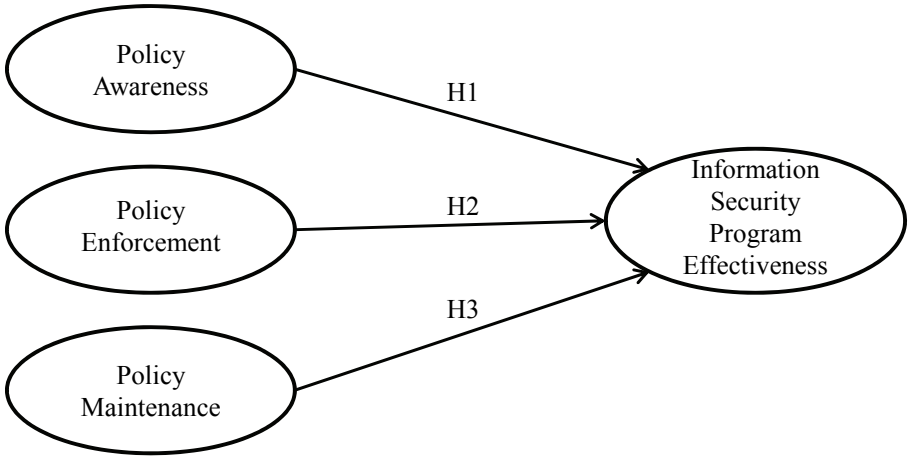
The theory of organizational learning has its roots in the strategic management literature and is the notion that organizations develop insights and changes in states of knowledge over time (Argyris & Schon, 1978). By gaining knowledge, organizations adapt and develop new structures and adjust to their environment to remain competitive for their long term survival under the assumption that change will improve performance and effectiveness (Fiol & Lyles, 1985). Within an organization, individual members and executives alike may come and go, but corporate memory, norms and values will adapt over time (Hedberg, 1981). In order for a process of acquiring skill and knowledge, or learning to occur, organizations make a conscious decision to change behaviors in response to a change in conditions or environment. Organizational learning has not occurred, however, until the knowledge is in the shared collective and stored in organizational memory so that it may be accessed, communicated and used to achieve goals and objectives (York University, 2010).

In regards to the current study, the goal of maintenance is to ensure policies are still working for the organization by protecting its valuable information and systems. Policies must be current, relevant, in 'good working order' and help to minimize the risk of costly incidents by articulating clear guidance about what is expected as proper employee behavior in regards to information security. Companies maintain their policies by updating or at least reviewing them on a cyclical (e.g. annual) or as needed basis (e.g. to address an emerging threat). Once updated, companies must approve or recertify their policies with an appropriate senior manager followed by some type of employee awareness campaign. Continually maintaining, updating, documenting and disseminating corporate policy helps ensure that learning is occurring in the organization. The consequence of not conducting maintenance is that policy can become outdated, neglected and thus irrelevant to shaping employee behavior (Knapp, Morris, Marshall, & Byrd, 2009). Moreover, failing to maintain policy may even demonstrate a general lack of top management support for information security overall. Hence, considering the importance of policy maintenance, we propose:

> *Hypothesis 3: Information security policy maintenance is positively associated with information security program effectiveness.*

Our complete theoretical model of information security policy and program effectiveness is a first-order nomological network containing four variables (see Figure 1).

FIGURE 1
MODEL OF INFORMATION SECURITY POLICY AND EFFECTIVENESS



METHODOLOGY

Data, Respondents and Survey Procedure

The respondents consist entirely of Certified Information System Security Professionals (CISSPs), representing a non-probability, judgment sample for our study. The requirements to earn the CISSP designation at the time of our study include passing a rigorous exam covering ten domains of information security knowledge, consenting to an ethical code and possessing a minimum of four years of professional experience in the field or three years of experience plus a college degree. Once certified, a person must earn continuing professional education (CPE) credits to maintain the designation. The CISSP certification program is managed by a non-profit organization called the International Information Systems Security Certification Consortium [$(ISC)^2$].

We collected data in two phases to minimize the potential validity threat of common method variance, which is a type of method bias where variable correlations are vulnerable to artificial inflation or deflation due to the collection approach. As a source of measurement error, common method variance can potentially threaten the validity of empirical research especially with self-report surveys where the predictor and criterion variables come from a matching source (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Fortunately, data collection procedures exist that can minimize this validity threat. For this purpose, we collected data in phases five days apart to increase the probability that participants were in a different cognitive disposition when giving responses to the predictor and criterion variables. Moreover, this five day gap decreased the probability of participants attempting to hypothesis guess (Straub, Limayem, & Karahanna-Evaristo, 1995) and desiring to answer in a socially acceptable manner (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). While it is impossible for time gaps to remove all method biases, our goal was to reduce the plausibility of this measurement error influencing the associations in the model.

We sent a single email to all CISSPs based in the United States requesting participation in our study. The official $(ISC)^2$ email contained other items of organization business. We had a 4.2% response rate from 9,600 CISSPs. This response rate was expected considering the email approach of seeking research participants with neither follow-up reminders nor professional incentives. After matching responses across the two collection periods, we obtained a useful sample of 297 CISSPs. Table 1 lists the reported industry of the respondents and Table 2 provides the size of respondents' organizations. Additional sample demographics are provided in Appendix C.

TABLE 1
INDUSTRY OF RESPONDENTS

Industry	Count	Percent
Government	83	28%
Info Tech, Security, Telecom	56	19%
Finance, Banking, Insurance	51	17%
Manufacturing	24	8%
Other	24	8%
Healthcare	22	7%
Education, Training	22	7%
Utilities	9	3%
Consumer Products, Retail	8	3%
Professional Services (legal, HR, etc.)	8	3%
Energy	5	2%
Non-Profit	4	1%
Transportation, Warehousing	4	1%
Travel, Hospitality, Entertainment	3	1%
TOTAL	323	100%

n = 297; respondents could choose multiple industries

TABLE 2
SIZE OF RESPONDENTS' ORGANIZATIONS

Size of Organization	Count	Percent
less than 500	57	19%
between 500-2,499	55	19%
between 2,500-15,000	81	27%
over 15,000	104	35%
TOTAL	297	100%

n = 297.

Measures

The survey contained questions examining respondents' perception of policy awareness, enforcement, and maintenance and information security program effectiveness in their organization. During survey development, questionnaire items that may have appeared to be excessively intrusive to potential study participants were removed. Because information security can be a sensitive research topic, a cautious approach to data collection has been recommended (Kotulic & Clark, 2004) due to a general suspicion of any research study that measures the behaviors of security practitioners especially in their own organizational context. In this effort, an expert panel of twelve security practitioners evaluated all candidate survey items on perceived intrusiveness using a *willingness-to-answer* scale (Knapp, Marshall, Rainer, & Ford, 2006) as well as construct validity based on an *item-to-construct* scale (Hinkin, 1998). Items with low construct validity or considered as potentially intrusive by the panel were removed from the instrument. The 18 survey items making up our research instrument are listed in Appendix A.

We assured participants that their individual responses would be confidential and only aggregated data would be published. We used a web-based survey with communication encryption and randomized the order of the question items during both survey phases. All participants responded using a 5-point Likert scale where 1=strongly disagree and 5=strongly agree. Knapp, Marshall, Rainer, & Ford (2005) provides further information about survey development. We averaged each variable's responses into an index and coded so that a high score indicates a high value for each variable. Sample items and Cronbach alpha (α) reliabilities for each variable follow:

Information Security Policy Awareness. Five items, one of which stated: "In the organization, necessary efforts are made to educate employees about new security policies" (α = 0.92).

Information Security Policy Enforcement. Four items, one of which stated: "In the organization, employees caught violating important security policies are appropriately corrected" (α = 0.87).

Information Security Policy Maintenance. Four items, one of which stated: "In the organization, information security policy is consistently updated on a periodic basis" (α = 0.91).

Information Security Program Effectiveness. Five items, one of which stated: "In the organization, generally speaking, information is sufficiently protected" (α = 0.92).

RESULTS

We used structural equation modeling software (Amos 17) to test the research model. Table 3 provides the measurement model: standardized factor loadings, critical value (z-statistic) and squared multiple correlations (SMC) for each of the 18 items in the instrument. Table 4 presents the means, standard deviations and zero-correlations for the variables. We modeled each of the measured factors in isolation, then in pairs, and then as a collective network following procedures from Segars & Grover (1998). To support convergent validity, all survey items loaded on the intended factor with no significant cross-loading present; all loadings were statistically significant and above 0.707, indicating that the latent construct is capturing over half the variance. An item loading and cross-loading matrix is supplied in Appendix B, which also supported initial convergent and discriminant validity.

TABLE 3
MEASUREMENT MODEL (n=297)

Constructs	Indicators	Loadings	Critical Value	SMC
Information Security	IE1	.86	---	.73
Program Effectiveness	IE2	.84	18.6	.71
	IE3	.76	15.8	.58
	IE4	.91	21.0	.82
	IE5	.81	17.1	.65
Information Security Policy	PA1	.71	13.7	.51
Awareness	PA2	.81	---	.66
	PA3	.91	19.5	.83
	PA4	.93	19.8	.87
	PA5	.86	17.4	.73
Information Security Policy	PE1	.82	---	.67
Enforcement	PE2	.82	15.5	.67
	PE3	.85	16.2	.72
	PE4	.72	13.0	.51
Information Security Policy	PM1	.91	---	.82
Maintenance	PM2	.77	17.3	.60
	PM3	.80	18.6	.64
	PM4	.92	24.7	.85

Note: All loadings significant at $p < .001$.

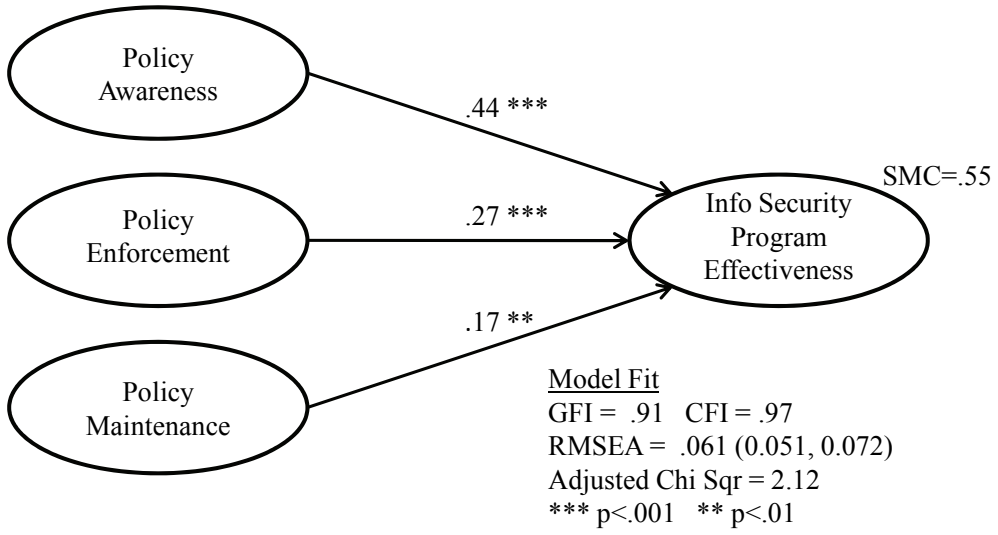
TABLE 4
MEANS, STANDARD DEVIATIONS AND CORRELATIONS [a]

Variable	Mean	s.d.	1	2	3	4
1. Security Policy Awareness	3.28	0.96	(.92)			
2. Security Policy Enforcement	3.45	0.86	.60**	(.87)		
3. Security Policy Maintenance	3.59	0.88	.56**	.46**	(.91)	
4. Security Program Effectiveness	3.56	0.80	.70**	.58**	.53**	(.92)

[a] n = 297. Items in parentheses are Cronbach alpha reliabilities.
** p < .01.

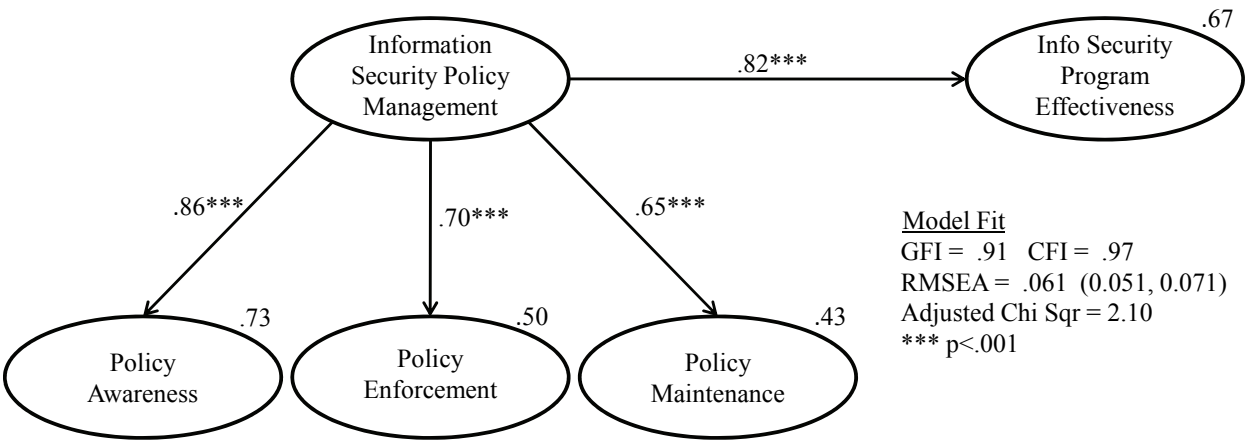
Figure 2 presents the path model (n=297): the standardized causal path findings, selected fit indices, and SMC value for the endogenous dependent variable, information security program effectiveness, in the upper right of the construct. All of the paths were significant. Additionally, supporting both convergent and discriminant validity, GFI, CFI and RMSEA are within acceptable ranges (Straub, Boudreau, & Gefen, 2004). Based on this data analysis, we found support for hypotheses 1, 2 and 3.

FIGURE 2
PATH DIAGRAM OF THEORETICAL MODEL (n=297)



We also tested a second-order model to provide an additional perspective on the factor analytic structure of the original. Our reason for testing this alternative model is the belief that a general latent construct may shape the first-order latent constructs. Thus, the three independent constructs may be influenced by a second-order factor that does not have direct effects on the observed variables of the study (Bollen, 1989). This second-order factor offers a diverse way of thinking about the relationships among the three independent constructs. Our interpretation of the second-order factor is *information security policy management*. In the second-order model, policy management represents the repeated actions of management to promote information security effectiveness by ensuring employees are aware of polices, and that policies are enforced and maintained in the organization.

FIGURE 3
PATH DIAGRAM OF SECOND-ORDER THEORETICAL MODEL (n=297)



Empirical support for both the original and second-order models were found in the magnitude and significance of the estimated parameters as well as the amount of variance explained by the structural equations (Segars & Grover, 1998). Unlike the original model, all paths in the second-order model were significant at $p < .001$, and the amount of variance explained in the dependent variable by SMC was higher in the second-order model (0.67 versus 0.55). Additionally, fit indices for both models were acceptable. The improved variance explained by the second-order model does not necessarily mean it is the better of the two. The original model, for instance, had the advantage of measuring the magnitude of the direct effect of each independent variable on the dependent variable. This advantage is lost in the alternative model due to the inclusion of the second-order factor.

DISCUSSION

In this study, we explored a theoretical model examining the impact of three dimensions of information security policy on information security program effectiveness. Specifically, our findings highlight the important direct effects that information security policy awareness, enforcement and maintenance have on the effectiveness of information security programs in organizations as well as the significance of considering these three dimensions as a combined effect of policy management. We found that awareness of an organization's policy has the largest direct impact on program effectiveness, whereas maintenance of the policy has the smallest effect, although still statistically significant. These findings suggest theoretical implications for the research literature and practical implications for managers of information security programs.

In the literature, to our knowledge, this study is the first to unite two distinct research streams (workplace deviance and organizational learning) to examine their applicability to information security policy. Our parsimonious model also helps practitioners focus on the fundamentals of policy management (i.e., awareness, enforcement and maintenance) as it impacts program effectiveness. Our study suggests that information security managers should prioritize their efforts and focus largely on policy awareness, as it had the largest impact on effectiveness. Also significant but secondary to awareness, managers should enforce existing policies as well as keep them relevant through regular maintenance. If an organization does a sufficient job of positive and proactive security awareness through adequate training, reminders, and employee orientation programs for example, it is reasonable to expect that enforcement will become less critical. In this sense, positive awareness can be more impactful in affirming security behaviors rather than enforcement, which tends to emphasize the negative. With enhanced awareness, employees may become more security minded and the organizational culture more acclimated and

accepting of security goals. It is plausible that organizations with stronger awareness programs will encourage more security-minded employees to conduct informal 'self-monitoring' of each other making formal enforcement and sanctions less critical or even necessary. Ultimately, our research suggests the three-pronged approach to information security policy management of emphasizing awareness, enforcement and policy maintenance will ultimately minimize corruption of organizational information and contribute to the bottom-line by reducing the costs of mediating information security breaches.

Moreover, we suggest that managers implement comprehensive security programs that focus on areas beyond what our models covers. For example, recent research shows that how employees perceive benefits of complying with security rules and their moral beliefs can have a significant impact on employee intention to violate security policies (Vance & Siponen, 2012). Others stress that when handling sensitive data such as a person's credit card or medical information, organizations should screen employees and seek those with higher levels of self-control and compatible moral beliefs in addition to the requisite technical skills and job experience (Hu, Xu, Dinev, & Ling, 2011).

Study Limitations and Future Research

Although our study produced fruitful findings, it has limitations. Our respondents were not pulled from a sample of general employees in organizations, but were professionals in the field of information system security. Thus, our results are not generalizable to other populations of employees. Second, our study had limited scope as we examined only three elements of information security policy, whereas security policy management includes other aspects such as policy development, managerial approval, employee monitoring and security risk assessment.

Based on these limitations, we offer a few suggestions for future research. First, we suggest surveying a wider group of employees whose expertise is not information system security. The insights of workers outside this professional realm undoubtedly hold promise for enhancing information security program effectiveness. Second, we suggest exploring the mechanisms through which organizations enforce their information security policies to minimize workplace deviance. It is possible that the incorporation of workers from various levels and sub-cultures of the organization will influence employees' adherence to the policies. Finally, it would be very interesting to explore the impact of electronic monitoring of workers and the effect of policy enforcement and penalties for security breaches on workers' day-to-day security practices.

CONCLUSION

Because the reality of security incidents causing major data losses will likely continue, it is essential for organizations to take systematic action to secure their information. Attention to information security policy management is a critical avenue that can meaningfully improve an organization's overall information security effectiveness. Based on our research, a systematic approach to policy management that principally focuses on awareness but also on enforcement and maintenance will significantly advance the safeguarding of information in organizations.

NOTE

A previous version of this paper was presented and published in the *Proceedings of the Southern Management Association*, November 10, 2011, Savannah, Georgia.

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APPENDIX A
SURVEY INSTRUMENT

Items used a 5-point Likert scale: 1=strongly disagree, 5=strongly agree (Knapp, Marshall, Rainer, & Ford, 2005). Each item begins with the phrase, "In the organization".

Information Security Program Effectiveness

E1 The information security program achieves most of its goals.
E2 The information security program accomplishes its most important objectives.
E3 Generally speaking, information is sufficiently protected.
E4 Overall, the information security program is effective.
E5 The information security program has kept risks to a minimum.

Policy Awareness

PA1 Employees clearly understand the ramifications of violating security policies.
PA2 Necessary efforts are made to educate employees about new security policies.
PA3 Information security awareness is communicated well.
PA4 An effective security awareness program exists.
PA5 A continuous, ongoing security awareness program exists.

Policy Enforcement

PE1 Employees caught violating important security policies are appropriately corrected.
PE1 Information security rules are enforced by sanctioning the employees who break them.
PE3 Repeat security offenders are appropriately disciplined.
PE4 Termination is a consideration for employees who repeatedly break security rules.

Policy Maintenance

PM1 Information security policy is consistently updated on a periodic basis.
PM2 Information security policy is updated when technology changes require it.
PM3 An established information security policy review and update process exists.
PM4 Security policy is properly updated on a regular basis.

APPENDIX B
FACTOR LOADING MATRIX

To assess initial validity of the measurement instruments, a cross-loadings matrix was constructed using principal components factoring with varimax rotation. Each item loaded on its theoretical construct more than on the other constructs, supporting convergent and discriminant validity.

Item	Security Effective	Policy Aware	Policy Enforce	Policy Maint
E1	**.778**	.280	.194	.211
E2	**.814**	.163	.192	.233
E5	**.796**	.199	.162	.174
E4	**.793**	.301	.241	.194
E3	**.764**	.216	.148	.163
PE1	.198	.204	**.791**	.161
PE2	.084	.157	**.796**	.155
PE3	.216	.166	**.810**	.176
PE4	.243	.136	**.821**	.137
PA1	.236	**.627**	.450	.164
PA2	.337	**.796**	.186	.232
PA3	.305	**.756**	.227	.232
PA4	.257	**.775**	.135	.266
PM1	.217	.163	.162	**.799**
PM2	.179	.192	.127	**.872**
PM3	.186	.186	.200	**.858**
PM4	.226	.224	.177	**.723**

APPENDIX C
ADDITIONAL SAMPLE DEMOGRAPHICS

TABLE C1
DEDICATED SECURITY OFFICE IN THE ORGANIZATION?

Response	Number	Percent
Yes	245	82.5%
No	51	17%
No Response	1	< 1%
TOTAL	297	100%

TABLE C2
POLICY APPROVAL LEVEL IN ORGANIZATION

Response	Number	Percent
Executive or upper management	246	83%
Middle management	43	14%
The org has policies, but mgt does not approve them	3	1%
Other management	3	1%
The organization does not have approved policies	1	< 1%
No response	1	< 1%
TOTAL	297	100%

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Impacts of Tax Incentive Programs on Mineral Exploration Expenditures in Canada: An Empirical Analysis

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From a government perspective, exploration investment is important for future global competitiveness in mineral industries. Canada provides an example of a nation that promotes exploration and is a major target of companies' exploration budgets. This paper analyzes impacts of the government policies and tax incentive programs on exploration spending by mining companies in Canada. The study is performed using econometric modeling of the Canadian exploration expenditures over the period of 1969-2008. Our analysis confirms that the tax incentive programs were effective in increase of exploration spending by the junior mining companies.

INTRODUCTION

From a government perspective, exploration investment is important for future global competitiveness in mineral industries. Canada provides an example of a nation that promotes exploration and is a major target of companies' exploration budgets. In 1997, the Canadian share of global exploration funds was 12%. It increased to 18% (USD3.1 billion) in 2011 according to the Metals Economics Group (MEG) estimates (MEG, 2012a and 2012b). Canada held the first place among nations in attracting exploration investments for the last 10 years, 2002-2011 (MEG, 2012a). In 2011, 781 mining companies budgeted funds for exploration in Canada. About 91% of these companies had the Canadian headquarters. The local companies' share of the total projected Canadian nonferrous exploration investments was almost 82%. MEG points that "exploration-focused tax incentives" are one of factors of Canada's non-ferrous exploration surge (MEG, 2012b). Given its success in attracting exploration investment, the example of Canada was selected for this study.

The objectives of this paper are to facilitate understanding of how the Canadian mineral exploration expenditures evolved over time and to highlight impacts of the government policies and tax incentive programs on exploration spending by senior and junior mining companies. These objectives are investigated using qualitative examination and econometric modeling of time dynamics of exploration expenditures.

This study conducts separate analysis of the Canadian exploration spending by senior and junior mining companies because of their differences in exploration behavior. "Senior" companies are those companies, which obtain incomes from mining or other business activities. In contrast, "junior" companies do not produce minerals, do not receive substantial incomes from business ventures, and mostly raise exploration money by issuing shares (Natural Resources Canada - NRCan, 2009). Junior companies are mainly involved in the grassroots exploration. Many, but not all, senior companies avoid grassroots exploration and concentrate their efforts later in the exploration process: for example, ore body

delineation and feasibility studies. Recent data show an increasing role of junior exploration companies. For example, in 2004, the juniors' exploration spending in Canada exceeded the seniors' exploration spending. From 2005, the juniors' exploration budgets constituted about half of the worldwide exploration expenditures (Goulden, 2006, and MEG, 2012b).

An analysis of exploration expenditures by seniors and juniors is performed in two steps: (i) qualitative examination and (ii) econometric modeling. The qualitative examination helps detect trends, peaks, and troughs of the Canadian exploration spending. It also helps associate movements of the exploration funds with possible underlying factors. The econometric modeling step quantifies impacts of factors affecting exploration expenditures. The models regress growth rates of exploration expenditures on the continuous growth rates in gold prices, dummy variables for government policies and discoveries. The data series of exploration expenditures are from the 2009 annual report "Overview of Trends in Canadian Mineral Exploration" by Natural Resources Canada (NRCan, 2009). The series include exploration plus deposit appraisal expenditures (on-mine-site plus off-mine-site activities), field work plus overhead. The gold price series is from the World Gold Council (2012).

Previous to this study, there have been several other studies that use econometric methods to understand mining exploration expenditures. A study by Eggert (1988) examines how corporate exploration expenditures depend on a mineral price index lagged one year. The author also tested whether exploration expenditures of seven mining companies correspond to their net incomes, indicators of availability of internal finds. The Canadian Intergovernmental Working Group has reported results of statistical estimations of exploration and deposit appraisal spending for Canada in successive issues of "Overview of trends in Canadian mineral exploration". The dependent variable was "exploration and deposit appraisal spending (field and overhead expenditures only)" with prices and expenditures in the previous year as regressors. The built models were used for forecasting exploration expenditures. The Group also provided results of econometric modeling of exploration expenditures in British Columbia by relating it to the British Columbia's mineral price index.

Our study differs from these works by: (i) use of more general econometric models, (ii) separate analysis of exploration expenditures by senior and junior companies; (iii) accounting for impacts of government policies and periods of important discoveries. Findings of our study will be useful for analyzing impacts of prices, government policies, and other factors on exploration spending.

The paper is organized as follows. The first section provides an introduction to the study. The second section examines the progression of exploration expenditures by senior and junior companies over the period of 1969-2008 and discusses factors influencing exploration expenditures. The third section describes an econometric analysis of exploration expenditures by junior and senior companies. The last section summarizes conclusions.

TIME DYNAMICS OF EXPLORATION EXPENDITURES BY SENIOR AND JUNIOR COMPANIES IN CANADA

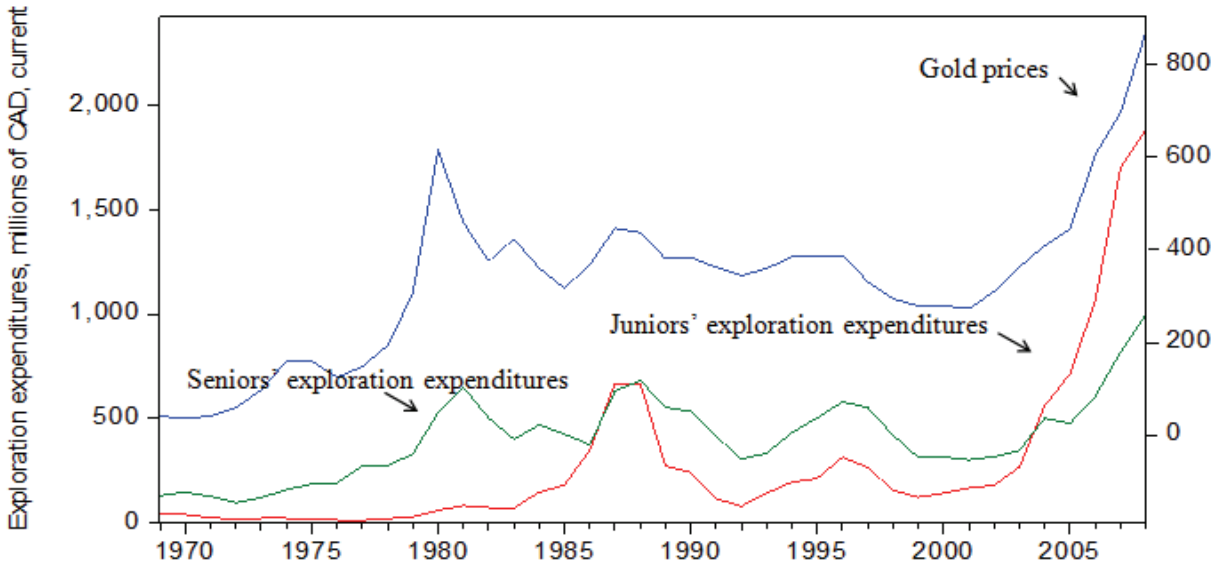
This section provides a qualitative examination of time dynamics of mineral exploration expenditures by senior and junior companies in Canada. It describes and compares trends, peaks and troughs, and volatilities in the evolution of exploration spending by these two investor types. The section also discusses impacts of factors influencing exploration expenditures. The qualitative examination sets the foundation for the quantitative analysis of exploration expenditures in the third section.

The evolution of the Canadian exploration expenditures by senior mining companies between 1969 and 2008 has been cyclical and volatile (Figure 1). It appears that seniors' exploration spending experienced a trend change in the late 1970s. A significant growth during the 1970s was altered by a declining trend with cycles around it afterwards (Figure 1). The seniors' exploration expenditures had three peaks and three troughs over the 1980s and the beginning 2000s. The majors' decreasing trend is indicated by a decline in the bottom levels of cycles (CAD374 million[1] in 1986, CAD 305 million in 1992, and CAD302 million in 2001) and by an overall decline in the top levels of cycles (CAD651.2 million in 1981, CAD681.8 million in 1988, and CAD 580.0 million in 1996).

The juniors' exploration expenditures were small during the 1970s, began to increase in the early 1980s, had a substantial but temporary spike in the late 1980s, later oscillated with cycles, somewhat parallel to seniors' cycles (Figure 1), and surpassed the seniors' exploration expenditures in 2004. The bottom levels of juniors' cycles point to an increasing trend: CAD79.9 million in 1992 and CAD123.3 million in 1999. Volatility of exploration spending by majors seems to be constant between 1979 and 2005, while volatility of juniors' spending varies over time.

The significant growth of seniors' exploration expenditures during the 1970s - the beginning of 1980s with a peak in 1981 and a following decline till 1986 might be associated with a surge in gold prices to a peak of $614.61 per ounce in 1980 and a drop to $317.18 per ounce in 1985 (Figure 1). Juniors' spending did not experience the same growth in the 1970s due to limited financing funds because of strict regulations on stock exchanges in Canada (Crowson, 2003).

FIGURE 1
CANADIAN EXPLORATION EXPENDITURES AND GOLD PRICES



Source: Natural Resources Canada, 2009

The 1984-1888 increase in exploration expenditures by both types of companies is mainly attributed to the Canadian government's tax incentive measures: Flow-Through Shares (FTS) and Mining Exploration Depletion Allowance (MEDA) (Bouchard, 2004; Crowson, 2003; Eggert, 1992). The FTS and MEDA programs were implemented in 1983. The FTS program allows junior mining companies "flow through" exploration expenditures to shareholders in exchange for shares of the company. Shareholders apply the "passed" expenses for tax deduction. Under the MEDA program, investors in flow-through shares had a significant tax write-off opportunity. For every $1 investment in qualified shares, investors could use a $1.33 tax deduction. MEDA was phased out in 1988, FTS is still continuing. It seems that the impact of MEDA was augmented by a favorable price environment - increasing gold prices in 1986-1988. In contrast, the implementation of the Canadian Exploration Incentive Program (CEIP) during the 1989-1990 period of falling metal prices could only temporarily reduce the decline rate of both seniors' and juniors' spending. The growth of exploration spending by both juniors and seniors between 1992 and 1996 and the following decline between 1997- 2000 appear to track changes in gold prices. Though, discoveries of gold and diamond deposits could contribute to the 1992-1996 increase in exploration expenditures as well. During the period 1992-1997, mining companies made major discoveries of diamonds, nickel, and gold in Canada: 1992 – Ekati (diamond), Boston (gold), Meliadine

West and East (gold); 1994 – Voisey's Bay (nickel), Diavik (diamond), Meadowbank (gold); 1995 – Gahcho Kue (diamond); 1996 – Snap Lake (diamond); 1997 – Victor (diamond).[2] The 1997-2000 decrease in exploration expenditures was also affected by the Bre-X case in 1997. After the news that the Bre-X company falsified its estimates of ore reserves in Indonesia, investors lost interest in equity financing of junior mining companies. Another adverse factor was a tech-shares bubble of the late 1990s. Investments funds were diverted to financing dot.com companies. Juniors' exploration spending rebounded back in 2001, while seniors' spending rebounded with a lag of one year – in 2002. These increases in exploration spending could be influenced by growing metal prices and by the 15% Investment Tax Credit for Exploration, implemented since October 2000 (Bouchard, 2004).

EMPIRICAL ANALYSIS OF EXPLORATION EXPENDITURES

As we observe, gold prices, tax incentive programs, and discoveries influence exploration expenditures. This section models the continuous growth rate of exploration spending by junior and senior mining companies as a function of gold prices, tax measures, and discoveries:

$$dlog(juniorexplr)_t = c + a_1 d\,log(goldprice)_t + a_2 dfts + a_3 ddiscov + \varepsilon_t \quad (1)$$

$$dlog(seniorexplr)_t = c + a_1 d\,log(goldprice)_t + a_2 dfts + a_3 ddiscov + \varepsilon_t \quad (2)$$

$$dlog(juniorexplr_t) = log(juniorexplr)_t - log(juniorexplr)_{t-1}$$

$$dlog(seniorexplr_t) = log(seniorexplr)_t - log(seniorexplr)_{t-1}$$

$$dlog(goldprice_t) = log(goldprice)_t - log(goldprice)_{t-1},$$

where *juniorexplr* is the juniors' exploration expenditures, *seniorexplr* is the seniors' exploration expenditures, *goldprice* is the average annual gold price, *dfts* is a dummy variable for the FTS-MEDA programs in the 1983-1987 period, *ddiscov* is a dummy variable for discoveries in the 1993-1996 period. The dummy variable *dfts* equals one for the years 1983-1987 and zero in other years. The dummy variable *ddiscov* has values of one in the years 1993-1996 and zero in other years. The estimation results for models (1) and (2) are displayed in Table 1. The *t*-statistics are provided in parentheses below corresponding coefficients. The Breusch-Pagan-Godfrey heteroskedasticity test for model (1) indicates that the residuals are homoskedastic. Correlograms of residuals and the Breusch-Goldfrey Serial Correlation tests show that the residuals exhibit no serial correlation. Correlograms of squared residuals point to no conditional heteroskedasticity. The *t*-statistics for the gold price, *dfts* and *ddiscov* coefficients in model (1) for the juniors' exploration speding are above two, what implies that the coefficients are statistically significant. Model (1) shows that, holding everything else constant, if the growth rate in gold prices increases by 1 percent, then the growth rate of juniors' exploration investments increases by about 0.78% percent. The coefficients of dummy variables indicate that: (i) increases in exploration expenditures of the Canadian junior mining companies in the years 1983-1987 were significantly higher than would have been expected, given increases in gold prices; (ii) increases of juniors' exploration expenditures in the 1993-1996 period were significantly higher than would have been expected, given increases in gold prices and impacts of the FTS-MEDA program. Model (2) for the growth rate of seniors' exploration spending did not fit data well (adjusted R^2 is 0.177). Another model for seniors' exploration expenditures was considered:

$$log(seniorexplr)_t = c + a_1\,log(goldprice)_t + a_2 dfts + a_3 ddiscov + a_4 log(seniorexplr)_{t-1} + \varepsilon_t \quad (3)$$

The estimation results for model (3) are reported in Table 2.

TABLE 1
MODEL (1) AND MODEL (2) ESTIMATION RESULTS

	Dependent Variables	
Explanatory Variables	*dlog(juniorexplr (Model 1)*	*dlog(seniorexplr) (Model 2)*
dlog(goldprice)	0.7803 [3.0681]	0.4674 [3.1408]
dfts	0.4798 [2.9021]	0.0338 [0.3494]
ddiscov	0.3855 [2.1161]	0.1505 [1.4120]
C	-0.0662 [-0.9956]	-0.0042 [-0.1079]
Adjusted R-squared	0.293	0.177

TABLE 2
MODEL (3) ESTIMATION RESULTS

Explanatory Variables	*log(seniorexplr) (Model 3)*
log(goldprice)	0.6886 [6.5864]
dfts	-0.1240 [-0.8993]
ddiscov	-0.0003 [-0.0022]
C	2.0267 [3.3376]
AR(1)	0.6075 [4.2171]
Adjusted R-squared	0.878

The *t*-statistics are provided in parentheses below corresponding coefficients. The Breusch-Pagan-Godfrey heteroskedasticity test indicates that the residuals are homoskedastic. Correlograms of residuals and the Breusch-Goldfrey Serial Correlation tests show that the residuals exhibit no serial correlation.

Correlograms of squared residuals point to no conditional heteroskedasticity. The *t*-statistics for the gold price and one lag of the seniors' exploration expenditures coefficients in model (3) are above two, what implies that the coefficients are statistically significant. Results of model (3) show that: (i) if the current gold prices increase by 1 percent then the current seniors' exploration investments increase by 0.69 percent; (ii) the current seniors' exploration investments are strongly influenced by previous year exploration investments. The *t*-statistics of the estimated coefficients of the dummy variable for tax programs (*dfts*) and the dummy variable for the deposits discoveries (*ddiscov*) are below 2. This confirms that the seniors' exploration expenditures were not significantly affected by the FTS-MEDA programs in 1983-1987 and by discoveries in 1993-1996.

CONCLUSIONS

This paper examines and models mineral exploration spending by senior and junior mining companies in Canada. Models are built using the econometric techniques. There were only a few econometric studies of exploration expenditures: for example, those by Eggert (1988) and by the Canadian Intergovernmental Working Group in successive issues of "Overview of trends in Canadian mineral exploration". Our study differs from these earlier works by the use of more general models for exploration levels and the separate examination of the seniors' and juniors' exploration expenditures.

Results of models 1 and 2 demonstrate that increases in exploration expenditures of the Canadian junior mining companies in the years 1983-1987 (the tax incentives implementation period) were significantly higher than would have been expected, given increases in gold prices; (ii) increases of juniors' exploration expenditures in the 1993-1996 period (the major discoveries period) were significantly higher than would have been expected, given increases in gold prices and impacts of the FTS-MEDA program. The junior mining companies respond stronger to the gold price changes than the senior mining companies. Seniors' exploration spending is affected by the changes in gold prices and depends on the previous year's exploration spending. The analysis illustrates importance of discoveries for bolstering exploration expenditures by junior mining companies. Our models confirm that the tax incentive programs were effective in increase of exploration spending by the junior mining companies.

This study examines impacts of gold prices, government policies, and discoveries on exploration spending by the Canadian mining companies. In the follow-up papers I would like to analyze exploration costs and returns on exploration investments in Canada.

ENDNOTES

1. Levels of exploration expenditures are in the Canadian dollars.
2. The discoveries information is from (Bouchard, 2004).

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Government Spending or Tax Cuts for Education in Taylor County, Texas

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On February 17, 2009, President Barack Obama signed into law the American Recovery and Reinvestment Act. The Education sector in Taylor County, Texas, received $17,251,899 in grants over 16 months for 17 projects. This paper will model the impact of the stimulus package on Taylor County, Texas, and its effect on education, and then compare this model with an alternate tax relief model to gauge indirect and induced changes in the Education sector within the county. This paper will examine the sustainability of one time government grants versus community generated funding. These models will be compared with actual changes in the Education sector, where boom and bust spending has forced significant layoffs as funding runs out.

INTRODUCTION

On February 17, 2009, President Barack Obama signed into law the American Recovery and Reinvestment Act ("The economic stimulus," 2009). Taylor County, Texas, received $47,904,582 over a period of 16 months for 78 projects. The Education sector alone in Taylor County, Texas, received $17,251,899 in grants over 16 months for 17 projects.

At the federal level, the Department of Education's budget doubled to $105.9 billion. It directed funds to public schools, universities, and childcare centers over two years. A little more than half of the funds ($53.6 billion) were given to the states to stabilize their educational funds and offset planned cuts in education. State budget shortfalls at the national level were approximately $132 billion; the infusion of federal dollars meant that teacher layoffs would be curtailed. Additionally, the stimulus allocated $650 million to a program, Enhanced Education through Technology Funding (EETTF), aimed at improving technology outcomes in the classroom (Electronic Education Report, 2009).

This paper will model, firstly, the impact of the stimulus package on education in Taylor County, Texas, and then compare this outcome with an alternate tax relief model to gauge indirect and induced changes in the Education sector within the county.

Funds directed to specific non-education sectors of the county drive the positions and other educational requirements to support new activity created within education. Therefore, in order to understand the full impact of the stimulus package on education, this paper will model, secondly, the entire stimulus package for Taylor County, Texas.

Thirdly, several tax relief packages were developed to model the support required to save education positions equal to the number of actual education positions lost in Taylor County.

This paper offers comparisons of one-time government grants versus community-generated funding for education. It also compares the first two models to actual changes in the Education sector (where boom-and-bust spending has forced significant layoffs).

Models in this analysis were developed using the IMPLAN system (IMPLAN, 2012). The comparison of tax relief and government spending outputs from IMPLAN allows us to model funding policy and its effectiveness on Taylor County's Education sector. By constructing Social Accounts that describe the structure and function of a specific economy, IMPLAN creates a highly localized model to investigate the consequences of projected economic transactions on geographic regions. Over one thousand public and private institutions use IMPLAN. It is the most widely employed and accepted regional economic analysis software for predicting economic impacts.

IMPLAN's Social Accounting Matrices (SAMs) capture the actual dollar amounts of all business transactions occurring in a regional economy as reported each year by businesses and governmental agencies. SAM accounts are a better measure of economic flow than traditional input-output accounts because they include "non-market" transactions. Examples of these non-market transactions are taxes and unemployment benefits (IMPLAN, 2004).

The comparison of tax relief and government spending outputs from IMPLAN allows us to examine funding policy and its effectiveness on education in Taylor County. One of the stated goals of the stimulus package was to create or save jobs in education. The three model outcomes are compared for differences in job creation for the Education sector in Taylor County. This paper is intended to improve the economic choices made by Independent School Districts and policy makers in Taylor County, Texas, and the city of Abilene.

EDUCATION FUNDING IN TAYLOR COUNTY

Taylor County funding follows state guidelines. Texas currently uses a weighted funding approach, where a basic allotment is based on average daily attendance. This allotment is then adjusted based on subgroups such as gifted and talented, vocational, bilingual, and compensatory or special education students. Educational funding formulas at their best are confusing. The authors' intent is to offer suggested alternatives to funding, not to question the current methodology in use.

In 2009–2010, Taylor County funds were sourced 5% from federal, 57% from state, and 38% from local funds (Funding Information, 2011). In 2004, the average county in America sourced 7.3% from federal, 49.7% from state, and 43% from local funds (The Index of Education Effort, 2004). In 2006, Texas changed the funding formulas to be less locally oriented and more reliant on state and federal funds.

Funds for education are sourced predominantly from property taxes. Strobel points out that part of the stimulus package provided tax law changes to encourage the economy (Strobel, 2009). For properties placed into service after December of 2008, taxpayers were allowed an additional depreciation deduction equal to 50 percent of the adjusted basis of the qualified property. This depreciation allowance is intended to stimulate local growth in property taxes in the long term. As business and property values improve, tax revenues for local schools could increase.

MODEL DEVELOPMENT

We obtained stimulus data for Taylor County, Texas, from the web site www.recovery.gov ("Stimulus package accountability," 2009). Taylor County zip codes were used to find total expenditures in Taylor County (refer Table 1).

TABLE 1
TAYLOR COUNTY STIMULUS BY TYPE, NUMBER OF AWARDS AND ZIP CODES

Stimulus by Zip			
Zipcode	Contracts	Grants	Grand Total
79601		$ 3,801,521	$ 3,801,521
79602		$ 14,167,950	$ 14,167,950
79603		$ 643,062	$ 643,062
79604	$ 6,754,940	$ 14,496,557	$ 21,251,497
79605		$ 659,536	$ 659,536
79606		$ 2,165,936	$ 2,165,936
79607	$ 5,124,418		$ 5,124,418
79698		$ 36,082	$ 36,082
79699		$ 54,580	$ 54,580
Grand Total	**$ 11,879,357**	**$ 36,025,224**	**$ 47,904,582**

Projects requesting funding are listed in Appendix A, detailing the Taylor County stimulus projects by the Funding Agency (e.g., Abilene Christian University), Award Area (e.g., Department of Education), the amount of the funding, the IMPLAN sector associated with each project, and the Project Title given by the Funding Agency.

The Stimulus Package Accountability Web Site revealed the funding months and years for each project. Project funding dates and IMPLAN sectors were used to create a table summarizing the project descriptions, sectors, and total expenditures by year (refer Table 2). It should be noted that funds allocated to monitor and continue government services were assigned to those government sectors being monitored. Funds allocated to provide social services were assigned to the appropriate non-government sectors.

TABLE 2
IMPLAN DESCRIPTION, SECTORS, AND TOTAL EXPENDITURES BY YEAR

Sector	Implan Description	2009	2010	Total
39	Maint & repair construct of nonresident struc	$ 14,635,955	$ 2,957,684	$ 17,593,639
40	Maint & repair construct of residential struc	$ 3,567,059	$ -	$ 3,567,059
373	Other computer related services- including fa	$ 150,809	$ -	$ 150,809
374	Management- scientific- and technical consult	$ 57,576	$ -	$ 57,576
399	Child day care services	$ -	$ 895,987	$ 895,987
401	Community food- housing- and other relief ser	$ 147,752	$ 123,448	$ 271,200
402	Performing arts companies	$ 16,435	$ -	$ 16,435
424	Grantmaking- giving- and social advocacy orga	$ 572,314	$ -	$ 572,314
425	Civic- social- professional- and similar orga	$ 798,559	$ 3,575,754	$ 4,374,313
430	* Not unique commod (S&LG passenger transit)	$ 2,057,460	$ -	$ 2,057,460
432	Other state and local government enterprises	$ 516,085	$ 100,000	$ 616,085
437	* Special (S&LG Non-Ed Emp & Payroll)	$ 389,143	$ -	$ 389,143
438	* Special (S&LG Ed Emp & Payroll)	$ 16,382,448	$ 960,114	$ 17,342,562
Total		**$ 39,291,595**	**$ 8,612,987**	**$ 47,904,582**

In preparation for the comparative tax rebate model, the authors reviewed the current demographic statistics for Taylor County, Texas, available from the U.S. Census Bureau, 2009, American Community Survey, to obtain a cross section of households by income bracket. We found that the IMPLAN data analysis has an upper salary income stratum of over $200,000; therefore, any number over $200,000 was

accumulated into the top stratum. Once the population estimates were established for each stratum, we recorded the midpoint of each salary range to serve as the average of the possible incomes in each stratum.

Using the Internal Revenue Service's web site 2009 ("Internal revenue service," 2009) marginal tax rates for each income level, the marginal tax rates were multiplied by the midpoint income of each income level to determine the amount of federal tax revenue per household in Taylor County by income level. The estimated federal tax revenue per household was then multiplied by the estimated number of households at each income level to estimate total tax revenue per income level.

A proposed $47,904,582 tax rebate per income level was apportioned by calculating the percentage of total federal tax revenue by income level over total federal tax revenue. Refer to Table 3 - Determination of Total Tax Rebate per Income Level - to review the apportioned funds.

TABLE 3
DETERMINATION OF TOTAL TAX REBATE PER INCOME LEVEL

Income Level	Estimated Households per Income Level	Income Level Midpoint	Marginal Tax Rate	Estimated Federal Tax Revenue per Household	Estimated Total Federal Tax Revenue per Income Level	Estimated Total Federal Tax Revenue per Income Level as a Percentage of Estimated Total Federal Tax Revenue	Total Tax Rebate per Income Level
Less than $10,000	3,386	$ 5,000	0%	$ -	$ -	0.0%	$ -
$10,000 to $14,999	2,604	$ 12,500	10%	$ 250	$ 650,870	0.2%	$ 73,369
$15,000 to $24,999	6,963	$ 20,000	15%	$ 1,250	$ 8,702,531	2.0%	$ 980,983
$25,000 to $34,999	6,410	$ 30,000	15%	$ 2,750	$ 17,625,417	4.1%	$ 1,986,806
$35,000 to $49,999	5,935	$ 42,500	17%	$ 4,737	$ 28,114,199	6.6%	$ 3,169,142
$50,000 to $74,999	10,524	$ 62,500	25%	$ 9,099	$ 95,761,138	22.5%	$ 10,794,568
$75,000 to $99,999	5,449	$ 87,500	27%	$ 15,599	$ 84,999,223	20.0%	$ 9,581,443
$100,000 to $149,999	4,039	$ 125,000	28%	$ 25,974	$ 104,908,077	24.7%	$ 11,825,647
$150,000 to $199,999	986	$ 175,000	30%	$ 40,448	$ 39,882,207	9.4%	$ 4,495,678
$200,000 or more	925	$ 200,000	33%	$ 47,923	$ 44,329,086	10.4%	$ 4,996,947
Total	**47,221**			**$ 148,030**	**$ 424,972,749**	**100.0%**	**$ 47,904,582**

ECONOMIC IMPACT METHODOLOGY

There are two widely used economic impact modeling software packages available for economic analysis: the REMI model, developed by Regional Economic Models, Inc. and IMPLAN (Impact Planning), developed by the Forest Service of the Department of Agriculture and distributed by MIG, Inc. (Formerly Minnesota IMPLAN **G**roup, Inc.). Crihfield and Campbell (1991) compared these two models and found significant and sizable differences in the two system outputs. Crihfield and Campbell found the REMI system multipliers to be 32% to 57% larger than IMPLAN. Given a choice in package selection for modeling, the authors used the more conservative modeling package of the two with regard to multipliers – the IMPLAN system.

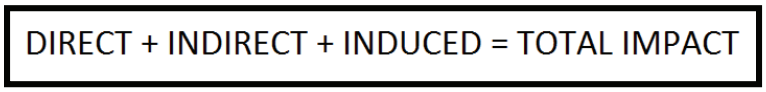
Using IMPLAN software, the authors calculated the impact of the stimulus package data on business activity based on investment in projects and grants during each of the years 2009 and 2010. Specifically, this analysis measures the anticipated economic impacts of the 2009 Stimulus Package using the IMPLAN input-output economic system and RIMS II (a similar system produced by the Census Bureau). We customized the models by categorizing the industry investments into IMPLAN Sectors. We used regional purchasing coefficients found in the model to determine the percentage of projects expended within Taylor County. In any business transaction, funds flow away from the study area through normal business channels and do not affect it.

An economy can be measured in any number of ways. The three most common are: "Output," which describes total economic activity and is closely linked to a firm's gross sales; "Employee Earnings," which corresponds to wages and benefits; and "Employment," which refers to permanent jobs that have been created in the local economy.

In an input-output analysis of these types of activities, it is useful to distinguish three types of expenditure effects: direct, indirect, and induced.

- Direct effects are production changes associated with the immediate effects on final demand. The payments made by an out-of-town visitor to a hotel operator are an example of a direct effect, and so is the money spent by that same visitor at a restaurant.
- Indirect effects are production changes in backward-linked industries caused by the changing input needs of directly affected industries – typically, additional purchases to additional output. Satisfying the demand for an overnight stay will require the hotel operator to purchase cleaning supplies to clean the room. These payments affect the economic status of other local merchant workers (e.g., grocery and cleaning suppliers).
- Induced effects are the changes in regional household spending patterns caused by changes in household income generated from the direct and indirect effects. Both the hotel operator and restaurant experience increased income from the visitor's stay, for example, as do the cleaning supplies outlet and the food service vendor. Induced effects capture the way in which local merchants spend this increased income in the local economy.

FIGURE 1
THE FLOW OF ECONOMIC IMPACTS



The interdependence between different sectors of the economy is reflected in the concept of a "multiplier." The output multiplier divides the total (direct, indirect, and induced) effects of an initial spending injection by the value of that injection. The higher the multiplier, the greater the interdependence among different sectors of the economy. An output multiplier of 1.3, for example, means that for every $1,000 injected into the economy, another $300 in output is produced in all other sectors.

IMPACT ANALYSIS AND EDUCATION FUNDING POLICY

Impact analysis can help focus education funding policy debates on facts rather than emotions. Impact analysis models tax revenues based on actual consumer spending patterns for each county. It is these spending patterns that generate funding for each of the tax segments at the state and local levels. Impact analysis is used extensively in private sector analysis but has seen little use in the government sector. Impact analysis is problematic for government analysts in that it could actually disprove the benefits of the politically motivated project, while proving the benefits of alternate projects in the long-term.

When given a choice of direct or induced funding for education there is the problem of *moral hazard*. The Education sector is "In it to win it!" so given a known quantity of funds versus an unknown model for funds (waiting on property tax increases from other stimulus), the Education sector would likely choose the sure option - directed funding. From a local county standpoint, modeling allows commissioners to predict tax revenues generated by various tax relief packages. In most cases, counties will choose the option that generates the highest general revenues for the county. The county can fund more educational spending through higher property taxes brought about by improvements in the local economy, while the school will choose directed funding which lowers possible county resident spending. Table 4 sets out the directed funds by Education sector in Taylor County.

TABLE 4
STIMULUS FUNDS FOR TAYLOR COUNTY EDUCATION

Funded Agency	*Local Stimulus Amount*	*Project Title*
ABILENE INDEPENDENT SCHOOL DISTRICT	$ 960,114	Title II, Part D -- Enhancing Education Through Technology.
ABILENE INDEPENDENT SCHOOL DISTRICT	$ 85,469	Preschool Grants for Children with Disabilities
ABILENE INDEPENDENT SCHOOL DISTRICT	$ 79,398	Education for Homeless Children and Youth.
ABILENE INDEPENDENT SCHOOL DISTRICT	$ 3,627,947	Title I, Part A--Improving Basic Programs Operated by Local Educational Agencies.
ABILENE INDEPENDENT SCHOOL DISTRICT	$ 114,281	Title II, Part D -- Enhancing Education Through Technology.
ABILENE INDEPENDENT SCHOOL DISTRICT	$ 6,322,420	State Fiscal Stabilization Fund -Education Fund
ABILENE INDEPENDENT SCHOOL DISTRICT	$ 3,306,928	Grants to States for the Education of Children with Disabilities
ABILENE REGIONAL MHMR	$ 324,956	Early Intervention Program for Infants and Toddlers with Disabilities
COMMUNITY ACTION PROGRAM, INC.	$ 312,859	Head Start Early Head Start ARRA
EDUCATION AGENCY, TEXAS	$ 90,846	Title II, Part D -- Enhancing Education Through Technology.
EDUCATION AGENCY, TEXAS	$ 28,936	Title I, Part A--Improving Basic Programs Operated by Local Educational Agencies.
EDUCATION AGENCY, TEXAS	$ 54,271	Title II, Part D -- Enhancing Education Through Technology.
EDUCATION AGENCY, TEXAS	$ 186,260	Head Start Quality Improvement and COLA (ARRA)
EDUCATION AGENCY, TEXAS	$ 202,046	Early Head Start
WYLIE INDEPENDENT SCHOOL DISTRICT	$ 90,601	Title I, Part A--Improving Basic Programs Operated by Local Educational Agencies.
WYLIE INDEPENDENT SCHOOL DISTRICT	$ 562,240	Grants to States for the Education of Children with Disabilities
WYLIE INDEPENDENT SCHOOL DISTRICT	$ 902,327	State Fiscal Stabilization Fund -Education Fund.
Total	**$ 17,251,899**	

MODEL OUTPUT – THE 2009 STIMULUS PLAN

The original stimulus plan to drive $47,904,582 into the Taylor County economy has an actual impact of only $43,046,960 in 2009 dollars. There are two reasons for the loss of impact on Taylor County. First, expenditures were carried out over eighteen months (so those dollars that were expended in 2010 are discounted back to 2009 dollars) and second, the impact of regional purchasing coefficients tells us that funds flow out of Taylor County through purchases of goods and services by contractors to provide the in-county goods and services. See Table 5 – The Model Output, Employment, Tax, and Sector Impact.

TABLE 5
THE MODEL OUTPUT, EMPLOYMENT, TAX, AND SECTOR IMPACT

Model	Impact Type	Direct	Indirect	Induced	Total
Tax Rebate	Output	$ 33,641,245	$ 8,843,829	$ 22,395,142	$ 64,880,216
	Employment	313	69	207	589
	Tax	$ 2,194,398	$ 343,790	$ 986,467	$ 3,524,655
	Sector Count	179	186	207	207
2009 Stimulus	Output	$ 28,695,817	$ 4,500,211	$ 9,850,932	$ 43,046,960
	Employment	313	40	92	446
	Tax	$ 248,269	$ 262,254	$ 506,872	$ 1,017,395
	Sector Count	21	178	205	206
Variance	Output	17.2%	96.5%	127.3%	50.7%
	Employment	0.0%	71.1%	123.8%	32.0%
	Tax	783.9%	31.1%	94.6%	246.4%
	Sector Count	752.4%	4.5%	1.0%	0.5%

TOTAL MODEL OUTPUT – ALTERNATE MODEL TAX REBATE

The effect of a tax rebate on the county is significantly different. Again, two factors influence the

outcome. First, a tax rebate can be issued all at once (a moment in time), and the expenditures occur quickly over multiple sectors as consumers spend extra income that becomes available. There is no multiyear lag to delay the effect of the stimulus. A second major factor is that these direct tax rebate dollars are spent locally in Taylor County. The tax rebate model generates $64,880,216 in output for the county, a 50.7% increase over the government's directed stimulus package.

MODEL COMPARISON

A tax rebate directly to the people of Taylor County has an output impact 50.7% greater than a directed stimulus package to specific industries in that county. Comparison of the number of sectors directly impacted is significantly different, with a 752.4% increase in those sectors impacted by a tax rebate by nature of consumer spending patterns rather than industry spending patterns. The direct tax rebate effect infuses funds into the county more quickly than a directed stimulus package.

With the tax rebate option, there is a 32% improvement in employment. Employment is spread out more significantly over a greater number of sectors - initial impact in the direct round of spending impacts 752.4% more sectors than a directed stimulus plan.

TABLE 6
JOB CREATION BY INCOME LEVEL

Job Income	*Tax Rebate*	*2009 Stimulus*
Less than $10,000	14	11
$10,000 to $14,999	9	8
$15,000 to $24,999	37	24
$25,000 to $34,999	30	22
$35,000 to $49,999	50	30
$50,000 to $74,999	12	10
$75,000 to $99,999	8	6
$100,000 to $149,999	2	2
$150,000 to $199,999	1	0
Over $200,000	0	0
Total	***163***	***113***

FIGURE 2
JOB CREATION BY INCOME LEVEL GRAPHIC

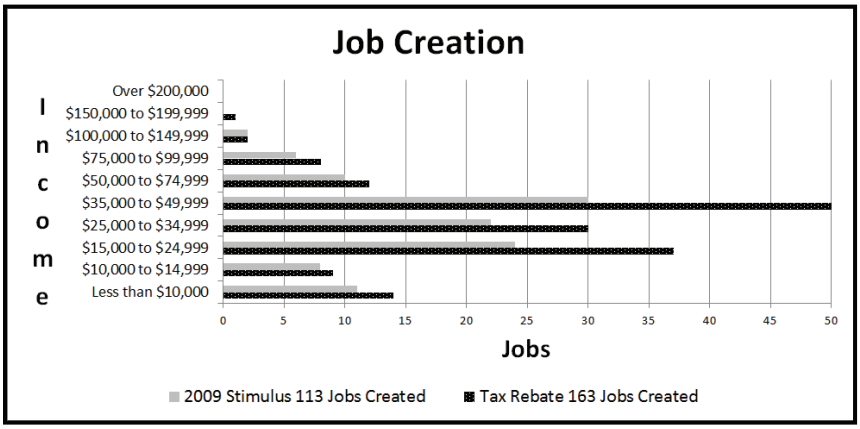


Table 6 and Figure 2 illustrate job creation resulting from the 2009 stimulus and the tax rebate models.

The tax rebate model creates 163 jobs while the stimulus model creates only 113. The tax rebate model creates more jobs in the $15,000 to $50,000 range, which implies that the types of jobs created are of higher value and longer-term than in cyclical construction or other minimum wage areas.

Tax revenues for Taylor County increase by 246.4% when a tax rebate is given rather than directed stimulus funds. The data indicates that these tax revenues are received earlier as tax rebate expenditures influence 752.4% more sectors in the initial round of spending.

Due to the difficulty in establishing the cost of command and control structures in the 2009 stimulus plan, no oversight costs were included in both IMPLAN models. Including these costs would reduce the effectiveness of the stimulus plan and improve the performance of the tax rebate model, since most supervision and monitoring is conducted outside of Taylor County.

TWO MODEL IMPACTS ON EDUCATION IN TAYLOR COUNTY

Both models create education impacts. Table 7 – Model Comparison of Education Sectors - shows a comparison of education positions created by each model. The 2009 stimulus plan has both direct and induced effects as the 2009 stimulus directly created positions in each Education sector through grants to specific education areas. Funds directly infused into education also add to induced increases as spending impacts employment.

TABLE 7
MODEL COMPARISON OF EDUCATION SECTORS

Model	*Direct*	*Indirect*	*Induced*	*Total*
Tax Rebate Education Employment	0	0	15.3	15.3
Stimulus Education Employment	113.4	0	70.4	183.8
Variance	***-100%***	***0%***	***-78%***	***-92%***

A total of 15.3 education positions were created with a tax rebate model. All positions in this model were induced by spending within the local economy. A total of 183.8 positions were created by direct grants creating positions and induced spending from the community. This comparison points out the benefits of direct funding for education rather than a tax rebate policy for local Education sectors.

Taylor County School Districts

The allocation of stimulus funds within the state of Texas proved problematic from the start. As funds became available through the stimulus program, regions began to subrogate funds from normal sources and replace them with stimulus funds. So rather than improving the lot of many school districts as presented, the stimulus funds merely reduced the state funds supplied to the schools. The resulting employment effect was a net zero change in positions. When time came to report stimulus fund use, the school districts became aware that the proposals put forward for the funds had agreed to add or maintain positions in education. In actuality, many school districts were reporting no additions and no change. After several rounds of reporting that showed no gains, the school districts were asked to "not report how many jobs were saved and added" but "how many jobs were now supported by these stimulus funds rather than state funds."

An analysis of (AISD Abilene Texas, 2011) net job changes throughout the five Independent School Districts in Taylor County for the 2010/11 and 2011/12 school years is summarized in Table 8.

TABLE 8
TAYLOR COUNTY INDEPENDENT SCHOOL DISTRICTS
NET JOB CHANGES 2009/10 – 2010/11

Taylor County Independent School Districts		
School District	**2010 - 2011 Net Job Change**	**2011 - 2012 Net Job Change**
Abilene ISD	17	-134
Merkel ISD	0	0
Wylie ISD	2	0
Jim Ned ISD	0	-1
Trent ISD	-5	0
Total	**14**	**-135**
* Numbers sourced from ISD interviews.		

Note: These numbers are sourced from telephone interviews with Independent School District administrators and are dependent on these administrators freely divulging these changes.

The 2010/11 school year funding through the tax rebate model approximates the changes shown in Table 8. Real changes of a net positive 14 (Table 8) closely approximate the induced number of 15.3 positions created by the tax rebate model (Table 7).

UNINTENDED CONSEQUENCES OF STIMULUS FUNDS

Funds intended to increase educational services in Taylor County lead to subjugation where state funds were dropped and replaced by the amount federal funds increased. **Jeffrey Leeds**, who runs education-focused private equity firm **Leeds Equity Partners,** said the following regarding the stimulus package for education:

> A lot of the stimulus money going in [to education] is designed to preserve what already exists. Most of it wouldn't be considered 'new spend.' If there is $120 billion that's allocated for education broadly, a good portion of that is simply replacing the state and local contributions (MacFayden, 30 March, 2009).

Figures 3, 4, and 5 attempt to visually display the sequence of events and unintended consequences leading to a drop in positions in 2011 and 2012. State funds once subrogated are hard to replace, resulting in extra pressures on educational funding in subsequent years. Lost federal funds in the 2011-2012 school years resulted in the reported loss of 135 positions in Taylor County schools.

FIGURE 3
INTENT OF STIMULUS FUNDING

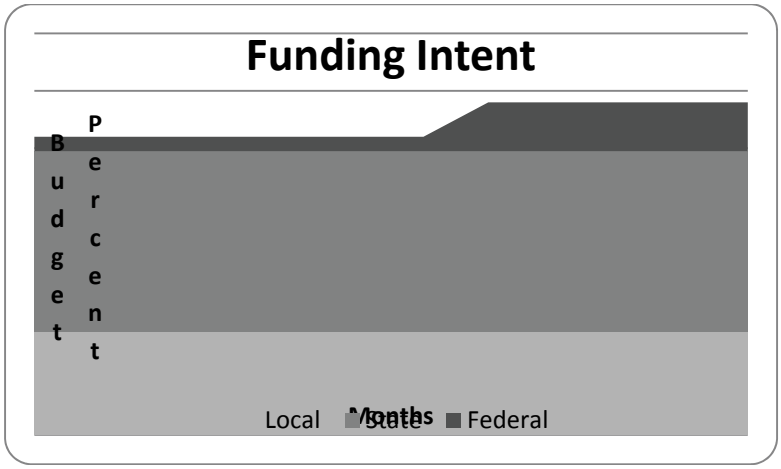


FIGURE 4
STIMULUS FUNDING EFFECT

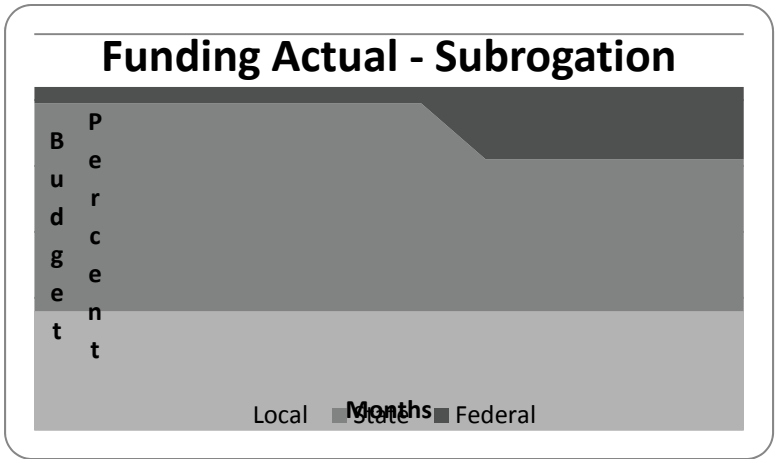
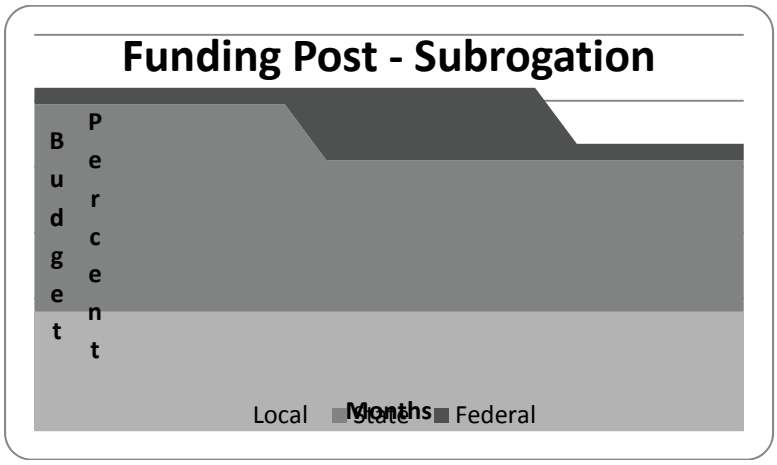


FIGURE 5
STIMULUS FUNDING RESULT



Dodaro was concerned with accountability of funds in such a volatile and changing environment as education (Dodaro, 2009). Dodaro states,

> Based on its experience in auditing Texas' use of previous federal awards and reporting internal control deficiencies or material weaknesses, the State Auditor's Office noted that relatively high risks generally can be anticipated with certain types of programs—such as (1) new programs with completely new processes and internal controls, (2) programs that lack clear guidance on allowable uses of Recovery Act funds, (3) programs that distribute significant amounts of funds to local governments or boards, and (4) programs that rely on sub-recipients for internal controls and monitoring. The State Auditor's Office also noted that general economic stability and public education programs are considered **to be high risk** because they are new programs and federal guidance regarding the state's appropriate use of the funds is uncertain.

Interviews with Taylor County school officials confirmed that all four areas of concern were problematic for local schools.

Rapoport reported that last spring the Texas Legislature needed to close a $27 billion shortfall and resisted protesters as they fought to stop deep cuts to education (Rapoport, 2012). After much debate, the cuts finally totaled $5.4 billion, forcing districts to lay off tens of thousands of teachers and staffers. The fallout for Taylor County was that at least 135 positions were lost. Subrogation had taken its toll.

SENSITIVITY ANALYSIS REPLACING LOST FUNDS

Sensitivity analysis allows us to estimate changes in education positions using modeled changes. Given the developed models, we can estimate the required Tax Relief or Direct Stimulus required to generate funds to support the lost positions.

TABLE 9
SENSITIVITY ANALYSIS

Model	Dollars Infused	Positions Created	Stimulus Per Position	Positions to Fill	Required Stimulus
Tax Rebate / Reduction	$ 47,904,582	15.3	$ 3,131,018	135	$ 422,687,488
Directed Stimulus	$ 47,904,582	107.5	$ 445,624	135	$ 60,159,243

Using this analysis, a tax rebate stimulus of $422,687,488 is required for Taylor County to generate 135 positions through induced spending. This indicates that a tax rebate for each of the 47,221 families in Taylor County would need to be $8,951 in either a tax reduction or tax rebate. The original stimulus of $47,902,582 would only have been a tax rebate of $1,014 per family.

A similar analysis for the directed stimulus shows that to create 135 positions the directed stimulus would need to be increased to $60,159,243 (a 25.6% increase in directed funding for the county) or $1,274 per family. In summary, to create one position in the schools the directed model needs $445,624 per position, whereas the tax rebate model requires $3,131,018 per position (a ratio of 7 to 1 favoring directed stimulus).

STATE AND COUNTY TAX REVENUES

State and local county revenues are significantly improved through the selection of a tax rebate rather than directed funding. Tables 10, 11, and 12 compare the two model outputs with regard to state and local

tax revenues not used to fund education. A tax rebate generates 564% more revenue at the local level than directed funds.

TABLE 10
TAX SNAPSHOT FOR DIRECTED STIMULUS

Tax Impact							
		Employee Compensation	Proprietary Income	Household Expenditures	Enterprises (Corporations)	Indirect Business Taxes	Total
Enterprises (Corporations)	Transfers	$ (4,652)	$ -	$ -	$ -	$ -	$ (4,652)
	Total	$ (4,652)	$ -	$ -	$ -	$ -	$ (4,652)
Federal Government NonDefense	Corporate Profits Tax	$ -	$ -	$ -	$ 143,314	$ -	$ 143,314
	Indirect Bus Tax: Custom Duty	$ -	$ -	$ -	$ -	$ 10,594	$ 10,594
	Indirect Bus Tax: Excise Taxes	$ -	$ -	$ -	$ -	$ 25,344	$ 25,344
	Indirect Bus Tax: Fed NonTaxes	$ -	$ -	$ -	$ -	$ 12,690	$ 12,690
	Personal Tax: Estate and Gift Tax	$ -	$ -	$ -	$ -	$ -	$ -
	Personal Tax: Income Tax	$ -	$ -	$ 389,118	$ -	$ -	$ 389,118
	Personal Tax: NonTaxes (Fines- Fees	$ -	$ -	$ -	$ -	$ -	$ -
	Social Ins Tax- Employee Contribution	$ 296,440	$ 40,904	$ -	$ -	$ -	$ 337,344
	Social Ins Tax- Employer Contribution	$ 311,300	$ -	$ -	$ -	$ -	$ 311,300
	Total	$ 607,742	$ 40,904	$ 389,118	$ 143,314	$ 48,630	$ 1,229,706
State/Local Govt NonEducation	Dividends	$ -	$ -	$ -	$ 20,102	$ -	$ 20,102
	Indirect Bus Tax: Motor Vehicle Lic	$ -	$ -	$ -	$ -	$ 3,452	$ 3,452
	Indirect Bus Tax: Other Taxes	$ -	$ -	$ -	$ -	$ 25,294	$ 25,294
	Indirect Bus Tax: Property Tax	$ -	$ -	$ -	$ -	$ 195,096	$ 195,096
	Indirect Bus Tax: S/L NonTaxes	$ -	$ -	$ -	$ -	$ 14,316	$ 14,316
	Indirect Bus Tax: Sales Tax	$ -	$ -	$ -	$ -	$ 193,994	$ 193,994
	Indirect Bus Tax: Severance Tax	$ -	$ -	$ -	$ -	$ 19,028	$ 19,028
	Personal Tax: Estate and Gift Tax	$ -	$ -	$ -	$ -	$ -	$ -
	Personal Tax: Income Tax	$ -	$ -	$ -	$ -	$ -	$ -
	Personal Tax: Motor Vehicle License	$ -	$ -	$ 5,806	$ -	$ -	$ 5,806
	Personal Tax: NonTaxes (Fines- Fees	$ -	$ -	$ 30,032	$ -	$ -	$ 30,032
	Personal Tax: Other Tax (Fish/Hunt)	$ -	$ -	$ 1,764	$ -	$ -	$ 1,764
	Personal Tax: Property Taxes	$ -	$ -	$ 3,354	$ -	$ -	$ 3,354
	Social Ins Tax- Employee Contribution	$ 3,416	$ -	$ -	$ -	$ -	$ 3,416
	Social Ins Tax- Employer Contribution	$ 14,696	$ -	$ -	$ -	$ -	$ 14,696
	Total	$ 18,110	$ -	$ 40,958	$ 20,102	$ 451,182	$ 530,352
Total		$ 621,202	$ 40,904	$ 430,076	$ 163,416	$ 499,810	$ 1,755,408

TABLE 11
TAX SNAPSHOT FOR TAX REBATE

Tax Impact							
		Employee Compensation	Proprietary Income	Household Expenditures	Enterprises (Corporations)	Indirect Business Taxes	Total
Enterprises (Corporations)	Transfers	$ (14,837)					$ (14,837)
	Total	$ (14,837)	$ -	$ -	$ -	$ -	$ (14,837)
Federal Government NonDefense	Corporate Profits Tax				$ 1,017,528		$ 1,017,528
	Indirect Bus Tax: Custom Duty					$ 74,708	$ 74,708
	Indirect Bus Tax: Excise Taxes					$ 179,730	$ 179,730
	Indirect Bus Tax: Fed NonTaxes					$ 89,484	$ 89,484
	Personal Tax: Estate and Gift Tax						
	Personal Tax: Income Tax			$ 1,340,684			$ 1,340,684
	Personal Tax: NonTaxes (Fines- Fees						
	Social Ins Tax- Employee Contribution	$ 945,598	$ 196,940				$ 1,142,538
	Social Ins Tax- Employer Contribution	$ 993,001					$ 993,001
	Total	$ 1,938,599	$ 196,940	$ 1,340,684	$ 1,017,528	$ 343,922	$ 4,837,673
State/Local Govt NonEducation	Dividends				$ 142,726		$ 142,726
	Indirect Bus Tax: Motor Vehicle Lic					$ 24,349	$ 24,349
	Indirect Bus Tax: Other Taxes					$ 178,374	$ 178,374
	Indirect Bus Tax: Property Tax					$ 1,375,810	$ 1,375,810
	Indirect Bus Tax: S/L NonTaxes					$ 100,959	$ 100,959
	Indirect Bus Tax: Sales Tax					$ 1,368,047	$ 1,368,047
	Indirect Bus Tax: Severance Tax					$ 134,183	$ 134,183
	Personal Tax: Estate and Gift Tax						
	Personal Tax: Income Tax						
	Personal Tax: Motor Vehicle License			$ 19,831			$ 19,831
	Personal Tax: NonTaxes (Fines- Fees			$ 102,351			$ 102,351
	Personal Tax: Other Tax (Fish/Hunt)			$ 6,045			$ 6,045
	Personal Tax: Property Taxes			$ 11,283			$ 11,283
	Social Ins Tax- Employee Contribution	$ 10,895					$ 10,895
	Social Ins Tax- Employer Contribution	$ 46,875					$ 46,875
	Total	$ 57,770	$ -	$ 139,510	$ 142,726	$ 3,181,722	$ 3,521,728
Total		$ 1,981,532	$ 196,940	$ 1,480,194	$ 1,160,254	$ 3,525,644	$ 8,344,564

TABLE 12
TAX REBATE STIMULUS TO REBATE VARIANCE

Tax Rebate Variance to Stimulus Comparing Tax Impact

		Employee Compensation	Proprietary Income	Household Expenditures	Enterprises (Corporations)	Indirect Business Taxes	Total
Enterprises (Corporations)	Transfers	219%					219%
	Total	219%					219%
Federal Government NonDefense	Corporate Profits Tax				610%		610%
	Indirect Bus Tax: Custom Duty					605%	605%
	Indirect Bus Tax: Excise Taxes					609%	609%
	Indirect Bus Tax: Fed NonTaxes					605%	605%
	Personal Tax: Estate and Gift Tax						
	Personal Tax: Income Tax			245%			245%
	Personal Tax: NonTaxes (Fines- Fees						
	Social Ins Tax- Employee Contribution	219%	381%				239%
	Social Ins Tax- Employer Contribution	219%					219%
	Total	219%	381%	245%	610%	607%	293%
State/Local Govt NonEducation	Dividends				610%		610%
	Indirect Bus Tax: Motor Vehicle Lic					605%	605%
	Indirect Bus Tax: Other Taxes					605%	605%
	Indirect Bus Tax: Property Tax					605%	605%
	Indirect Bus Tax: S/L NonTaxes					605%	605%
	Indirect Bus Tax: Sales Tax					605%	605%
	Indirect Bus Tax: Severance Tax					605%	605%
	Personal Tax: Estate and Gift Tax						
	Personal Tax: Income Tax						
	Personal Tax: Motor Vehicle License			242%			242%
	Personal Tax: NonTaxes (Fines- Fees			241%			241%
	Personal Tax: Other Tax (Fish/Hunt)			243%			243%
	Personal Tax: Property Taxes			236%			236%
	Social Ins Tax- Employee Contribution	219%					219%
	Social Ins Tax- Employer Contribution	219%					219%
	Total	219%		241%	610%	605%	564%
Total		219%	381%	244%	610%	605%	375%

CONCLUSIONS

Output from the models indicates that local counties should lobby for tax rebates rather than accept directed stimulus dollars for education projects. Based on model outputs, directed spending does not represent the spending patterns of the people within Taylor County. Tax rebate expenditures occur earlier in the rounds of spending as consumers react quickly to tax rebates through increased local spending. The fact that local purchases are higher with tax rebates increases tax revenues for the county. More middle-income jobs are created with the tax rebate model, and these jobs appear to be of a more long-term nature. While job creation at the county level is significant, within the Education sector it does not match the direct infusion of funds. Schools will always opt for direct federal funds while counties should always opt for tax rebates.

The model results presented above place pressure on state and local governments to avoid the problems associated with traditional spending decisions. The findings of this paper encourage the following practices:

1. Schools and county officials should focus on facts rather than emotions, model expenditures to gauge outcomes, and then choose the outcome that best fulfills the needs of the community, not the funded entity.
2. Researching funding methods allows us to be more informed of moral, hazard-based decisions. Researched outcomes can help in negotiation of different types of funding for local regions.
3. Recognize the benefit of impact analysis; private enterprise has based financial fortunes on the practice of impact analysis and has proven its efficacy.

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APPENDIX A
TAYLOR COUNTY STIMULUS PROJECTS

Funded Agency	Award Description	Local Stimulus Amount	Implan Sector	Project Title
ABILENE CHILD CENTERED	Department of Labor	$ 172,314	424	Community Service Employment Funded Through the Senior
ABILENE CHRISTIAN UNIVERSITY	Department of Education	$ 54,580	438	FEDERAL WORK STUDY
ABILENE INDEPENDENT SCHOOL	Department of Education	$ 960,114	391	Title II, Part D -- Enhancing Education Through Technology.
ABILENE INDEPENDENT SCHOOL	Department of Education	$ 85,469	391	Preschool Grants for Children with Disabilities
ABILENE INDEPENDENT SCHOOL	Department of Education	$ 79,398	391	Education for Homeless Children and Youth.
ABILENE INDEPENDENT SCHOOL	Department of Education	$ 3,627,947	391	Title I, Part A--Improving Basic Programs Operated by Local
ABILENE INDEPENDENT SCHOOL	Department of Education	$ 114,281	391	Title II, Part D -- Enhancing Education Through Technology.
ABILENE INDEPENDENT SCHOOL	Department of Education	$ 6,322,420	391	State Fiscal Stabilization Fund -Education Fund
ABILENE INDEPENDENT SCHOOL	Department of Education	$ 3,306,928	391	Grants to States for the Education of Children with Disabilities
ABILENE PHILHARMONIC	National Foundation on the Arts and	$ 16,435	402	Arts and the American Recovery & Reinvestment Act of 2009
ABILENE REGIONAL MHMR	Department of Education	$ 324,956	391	Early Intervention Program for Infants and Toddlers with
ABILENE REGIONAL MHMR	Department of Housing and Urban	$ 84,297	437	Homelessness Prevention and Rapid Re-Housing Program
ABILENE, CITY OF	Department of Energy	$ 1,131,600	39	Energy Efficiency and Conservation Grant Project
ABILENE, CITY OF	Department of Housing and Urban	$ 292,839	40	CDBG-R activities include a wide variety of community
ABILENE, CITY OF	Department of Justice	$ 150,809	373	Law Enforcement Initiatives
ABILENE, CITY OF	Department of Transportation	$ 878,042	39	JUDGE ELY BLVD
ABILENE, CITY OF	Department of Transportation	$ 361,467	39	CS
ABILENE, CITY OF	Department of Transportation	$ 84,985	39	SH 36
ABILENE, CITY OF	Department of Transportation	$ 2,057,460	430	Abilene Transit System Ecomonic Recovery Capital Infrastructure
ABILENE, CITY OF	Department of Transportation	$ 394,586	39	MOCKINGBIRD
ABILENE, CITY OF	Department of Transportation	$ 583,112	39	BARROW ST
AFCO TECHNOLOGIES INC	Department of the Air Force	$ 246,100	39	Federal Contract
AFCO TECHNOLOGIES INC	Department of the Air Force	$ 1,180,400	39	Federal Contract
AFCO TECHNOLOGIES INC	Department of the Air Force	$ 444,964	39	Federal Contract
AFCO TECHNOLOGIES, INC.	Department of the Air Force	$ 1,198,000	39	Federal Contract
AFCO TECHNOLOGIES, INC.	Department of the Air Force	$ 246,100	39	Federal Contract
AMERINE MECHANICAL, INC	Department of the Air Force	$ 288,750	39	Federal Contract
BOYS AND GIRLS CLUB OF ABILENE,	Department of Justice	$ 42,500	437	Boys & Girls Clubs Recovery Act National Mentoring Programs
COMMUNITY ACTION PROGRAM,	Department of Energy	$ 575,910	40	Recovery Act - Weatherizatoin Assistance Program for the State
COMMUNITY ACTION PROGRAM,	Department of Energy	$ 2,056,426	40	Recovery Act - Weatherizatoin Assistance Program for the State
COMMUNITY ACTION PROGRAM,	Department of Energy	$ 250,000	40	Recovery Act - Weatherizatoin Assistance Program for the State
COMMUNITY ACTION PROGRAM,	Department of Health and Human	$ 312,859	391	Head Start Early Head Start ARRA
COMMUNITY ACTION PROGRAM,	Department of Health and Human	$ 365,276	432	Community Services Block Grant/ARRA
COUNTY OF TAYLOR	Department of Energy	$ 57,576	374	Recovery Act-State of Texas Energy Efficiency and Conservation
COUNTY OF TAYLOR	Department of Justice	$ 150,809	432	Law Enforcement Initiatives
EDUCATION AGENCY, TEXAS	Department of Education	$ 90,846	391	Title II, Part D -- Enhancing Education Through Technology.
EDUCATION AGENCY, TEXAS	Department of Education	$ 28,936	391	Title I, Part A--Improving Basic Programs Operated by Local
EDUCATION AGENCY, TEXAS	Department of Education	$ 54,271	391	Title II, Part D -- Enhancing Education Through Technology.
EDUCATION AGENCY, TEXAS	Department of Health and Human	$ 186,260	391	Head Start Quality Improvement and COLA (ARRA)
EDUCATION AGENCY, TEXAS	Department of Health and Human	$ 202,046	391	Early Head Start
FOOD BANK OF ABILENE INC	Department of Agriculture	$ 33,662	401	Texas TEFAP CAP Recpvery Act
G 2-V ENTERPRISES, INC.	Department of the Air Force	$ 139,500	39	Federal Contract
HARDIN-SIMMONS UNIVERSITY	Department of Education	$ 36,082	438	FEDERAL WORK STUDY
HAWKINS BUILDERS INC	Department of the Air Force	$ 1,500,000	39	Federal Contract
HAWKINS BUILDERS INC	Department of the Air Force	$ 499,951	39	Federal Contract
HAWKINS BUILDERS INC	Department of the Air Force	$ 1,096,007	39	Federal Contract
HAWKINS BUILDERS INC	Department of the Air Force	$ 1,055,992	39	Federal Contract
HAWKINS BUILDERS INC	Department of the Air Force	$ 2,050,390	39	Federal Contract
HAWKINS BUILDERS INC	Department of the Air Force	$ 552,600	39	Federal Contract
HOUSING AUTHORITY OF THE CITY	Department of Housing and Urban	$ 391,884	40	Sewer Line Replacement at Riviera Complex
JCL CONSTRUCTION INC.	Department of Defense (except	$ 26,428	39	Federal Contract
JCL CONSTRUCTION INC.	Department of Defense (except	$ 21,116	39	Federal Contract
NEW HORIZONS RANCH & CENTER	Department of Agriculture	$ 41,258	39	CNP-RA-NSLP Equipment (O)
PACE-AMTEX JOINT VENTURE	Department of the Air Force	$ 392,100	39	Federal Contract
SALVATION ARMY (GA), THE (INC)	Department of Housing and Urban	$ 400,000	424	Homelessness Prevention and Rapid Re-Housing Program
TRANSPORTATION, TEXAS	Department of Transportation	$ 184,225	39	BU 83-D;US 83
TRANSPORTATION, TEXAS	Department of Transportation	$ 193,328	39	IH 20
TRANSPORTATION, TEXAS	Department of Transportation	$ 1,583,740	39	SH 36
TRANSPORTATION, TEXAS	Department of Transportation	$ 76,424	39	US 83
TRANSPORTATION, TEXAS	Department of Transportation	$ 201,515	39	US 83
V & R DRYWALL, INC.	Department of the Air Force	$ 549,750	39	Federal Contract
WEST CENTRAL TEXAS COUNCIL OF	Department of Health and Human	$ 37,424	401	ARRA Home Delivered Nutrition Services
WEST CENTRAL TEXAS COUNCIL OF	Department of Health and Human	$ 76,666	401	ARRA Home Delivered Nutrition Services
WEST CENTRAL TEXAS COUNCIL OF	Department of Justice	$ 100,000	432	BJA FY 2009 Recovery Act Edward Byrne Memorial Justice
WEST CENTRAL TEXAS COUNCIL OF	Department of Justice	$ 123,448	401	OVW Recovery Act STOP Violence Against Women Formula
WORK FORCE CENTER OF WEST	Department of Health and Human	$ 223,541	399	Child Care and Development Fund (CCDF)
WORK FORCE CENTER OF WEST	Department of Health and Human	$ 672,446	399	Child Care and Development Fund (CCDF)
WORK FORCE CENTER OF WEST	Department of Health and Human	$ 2,102,927	425	17.259 RECOVERY ACT-WIA YOUTH FORMULA GRANTS-STATES /
WORK FORCE CENTER OF WEST	Department of Labor	$ 98,380	437	17.207 - RECOVERY ACT-EMPLOYMENT SERVICE STATE
WORK FORCE CENTER OF WEST	Department of Labor	$ 798,559	425	17.259 RECOVERY ACT-WIA YOUTH FORMULA GRANTS-STATES /
WORK FORCE CENTER OF WEST	Department of Labor	$ 316,494	425	17.259 RECOVERY ACT-WIA YOUTH FORMULA GRANTS-STATES /
WORK FORCE CENTER OF WEST	Department of Labor	$ 34,832	425	17.259 RECOVERY ACT-WIA YOUTH FORMULA GRANTS-STATES /
WORK FORCE CENTER OF WEST	Department of Labor	$ 1,121,501	425	17.259 RECOVERY ACT-WIA YOUTH FORMULA GRANTS-STATES /
WORK FORCE CENTER OF WEST	Department of Labor	$ 163,966	437	17.207 - RECOVERY ACT-EMPLOYMENT SERVICE STATE
WYLIE INDEPENDENT SCHOOL	Department of Education	$ 90,601	391	Title I, Part A--Improving Basic Programs Operated by Local
WYLIE INDEPENDENT SCHOOL	Department of Education	$ 562,240	391	Grants to States for the Education of Children with Disabilities
WYLIE INDEPENDENT SCHOOL	Department of Education	$ 902,327	391	State Fiscal Stabilization Fund -Education Fund.
YEARGAN CONSTRUCTION	Department of the Air Force	$ 391,210	39	Federal Contract
TOTAL		***$ 47,904,582***		

Achievements that Matter: Perspectives of Awakened Leaders

Joan Marques
Woodbury University

This article presents an overview of sixty-nine leaders' opinions on their greatest achievement in life so far. The leaders were selected through criterion- and snowball sampling, and resided predominantly in the Los Angeles area, with some in other parts of the US as well as other major producing nations of the world, such as India, Japan, and China. After a brief literature on leadership and some of the perspectives on this dynamic topic, the study will be described and the findings presented. It turned out to be that the achievements listed by the interviewed leaders could be clustered into three main theme categories: personal mastery, professional growth, and wellbeing of people. The value of these findings is that it brings to the surface a potential shift in awareness amongst leaders, which will hopefully spread and be followed by others.

INTRODUCTION

Leadership remains a fascinating topic, regardless of the number of books, papers, presentations, workshops, seminars, conferences, and courses that get created on this topic. The ever-present interest in leadership may very well have to do with the fact that it is such an identifiable and dynamic topic that has some solid core principles embedded in it, but also a wide variety of variables that speak differently to the imagination of different groups.

In this paper, a study of the opinions of sixty-nine leaders on their achievements will be presented. These leaders, all well-respected members of their society, were interviewed over the course of six years (2006 – 2011). The purpose of the interviews was to find out what made them stand out in their organization as well as in society. One of the questions asked pertained to the leaders' self-perceived greatest achievement. The question, which was part of a more comprehensive structured interview, was presented as follows: "What did you consider their greatest achievement so far?" When analyzing the leaders' responses to the question, some interesting perspectives surfaced, which will be shared in this article, after a brief literature review.

LITERATURE REVIEW

Leadership is one of the most frequently and divergently studied topics in social science. It is a dynamic topic that has significantly transformed over time. Trehan (2007) presents a nice overview of leadership throughout the past eighty years, starting with the "great man" approach, in which physical and gender factors were the main determinants, and where task and behavior orientation from leaders were considered uniform for all cultures, through the 80s and 90s where an emerging awareness of variations, to a period where vision, charisma and transforming abilities were applauded, and up to the current view

of leadership as a dynamic concept in which moral, political, emotional, and cultural aspects are influential. Karp (2009) concurs that leadership might best be perceived as "a dynamic process which occurs between people rather than depending on the individual characteristics of the leader - appointed or not" (p. 883).

While Trehan and Karp make solid points, we cannot get around the fact that certain behavioral traits and qualities of leaders are more appreciated in contemporary times than others. Based on a large number of factors among which increased exposure to other cultures due to more frequent traveling and expansive global communicating tools (Internet); shifting family structures; greater diversity and higher levels of education within the workforce, we have been experiencing an entire restructuring of the workforce, leading to entirely different expectations from our leaders today as those from fifty years ago. Much of this altered perception is also directly linked to the occurrences in the leadership field, particularly the business leadership field.

Yet, the call and the attention are there, but the actual progress is not holding the same pace. In their review of post-scandalous leadership manifestations as they appeared at the dawn of the 21st century and the effect of these manifestations on the media, Hannah and Zatzick (2008) find that, while a significant increase in attention to ethical leadership traits can be detected, there is still a lack of true integration of ethics in the portrayal of leaders. Hannah and Zatzick believe that this should be attributed to the fact that new views are not encouraged to deviate too much from the worldview, otherwise they will not be considered a viable part of the business media. The above implies that paradigm shifts, while applauded, should be phrased and interlaced with ultimate caution in media publications, otherwise they will not reach the eyeballs of the reading masses.

Nevertheless, it seems that, as the numbers, shapes and sizes of corrupted, selfish, bottom line, short-term oriented leaders increased on our radars, awareness has risen that something was wrong with this picture. That "something" was not merely affecting our immediate environment, but often entire communities. A saturation of the earlier mentioned leader type led to the changes that are now increasingly promoted in Business Schools, corporate seminars, conferences, and executive coaching sessions. A desire for more people-oriented, caring, balanced, responsible, yet still passionate leaders has been painting our research horizon for the past decade or more. Littlefield (2004) agrees, "The definition of leadership is no longer categorized as autocratic, democratic, and free reign. Within progressive organizations, leadership has been redefined to incorporate integrity, reliability, collaboration, trust, and empathy" (p. 23). Indeed: the unified call, albeit phrased differently by different researchers, is that leaders of today should be wakeful and mindful of stakeholder needs and not merely shareholder needs. Marques (2010) labels these leaders "Awakened leaders" and describes them as follows: "Awakened leaders […] are those who lead from the heart and soul. They are the corporate, community, and household leaders, official or unofficial, who refuse to put on different hats when it comes to their personality" (p. 308). These leaders are further profiled as practicing a holistic and authentic approach in every environment and at every time. Mostovicz, Kakabadse, and Kakabadse (2009) confirm, "Leadership calls for total commitment to the perpetual process of purpose seeking. While leaders are usually concerned with their legacies, their commitment to purpose has to go far deeper" (571).

In an effort to detect leaders' commitment to purpose, and in hopes to find some common patterns, the author of this paper set out to interview sixty-nine well-respected leaders who were sampled on basis of certain criteria. In the next section, this will be discussed.

THE STUDY

Selection Criteria and Demographics

The leaders were predominantly located in the US, and selected on basis of the following criteria: 1.They had to be currently and actively involved in a for-profit or non-profit business endeavor; 2.They had to be involved in their leadership activity for at least 5 years; 3. They had to be recommended by at least one person who had either worked under their leadership, or done business with them.

In order to obtain a broad scope of viewpoints, the leaders were selected from a wide variety of industries. They were in banking, entertainment, securities, food, education, design, engineering, airline, publishing, distribution, information technology, and more. The size of their venture was not a determining factor. Some leaders were heading corporations that were operating in multiple continents involving hundreds of employees, while others were engaged in a local venture with about thirty to fifty co-workers. Sixty percent of the leaders were in their third career, thirty percent in their second, and ten percent in their first career. All leaders had performed in several jobs and positions prior to engaging in their current passion. The average age of the leaders was forty-five years old. The youngest interviewee was twenty-seven and the oldest eighty-five. Sixty-three percent of the leaders were male, and thirty-seven percent were female. Sixty percent of the leaders were Caucasian, thirteen percent Asian (Chinese, Japanese, and Indian), ten percent Hispanic, eight percent African-American, five percent Jewish, and four percent classified themselves as "other" since they represented multiple ethnicities. Sixty-five percent of the leaders were involved in for-profit business ventures and forty-five percent in non-profit. The ten percent that was overlapping was involved in multiple ventures, of which some were for profit and others non-profit.

Data Analysis and Findings

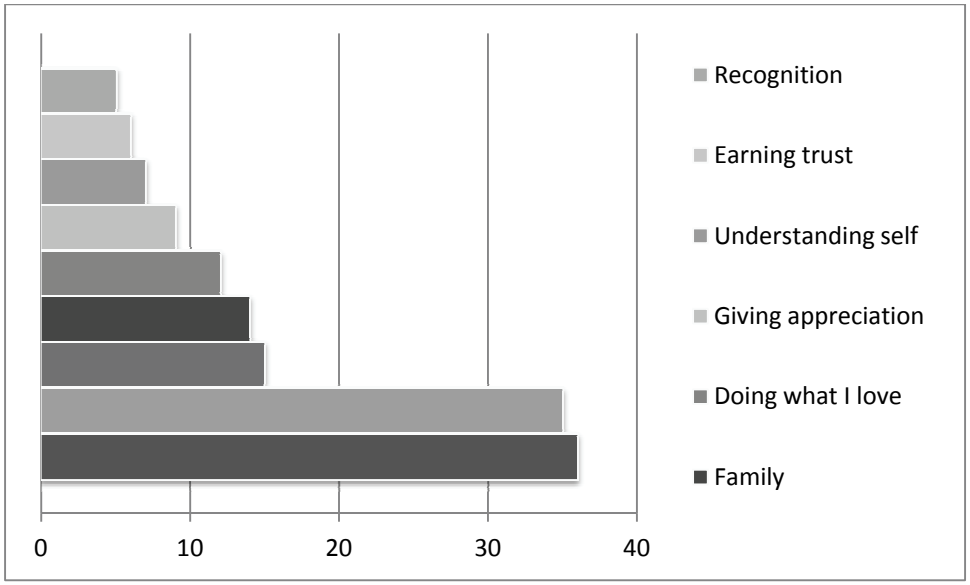
The leaders approached this question in various ways. Many of them did not limit their focus to one particular area, but considered various areas of life in their responses. For example, some leaders considered their family their greatest achievement in private life, but felt that in their career, the most important achievement was the start of their non-profit entity, which was now serving large parts of the community. Others mentioned the progress of those they mentored in their professional life as their greatest achievement in one area, but also included their elevated awareness, which led them to be appreciative of everything they could do for others in this review.

The data was analyzed according to the phenomenological procedure, which is qualitative in nature. Due to the fact that the responses were not offered in simple "yes" or "no" format, but in rich textual descriptions, this analysis method seemed most appropriate, even though the number of study participants was much higher than the three to fifteen that Creswell (1998, 2007) recommends in describing this study line. The phenomenological approach entails a process of horizonalizing data, which means that all responses to a question are placed on one line for comparison purposes. By doing so, similarities can be detected and listed as emerging themes. Based on the multiple answers many leaders provided, the number of factors listed added up to more than just 69. The initial list of emerging themes is presented in table 1 and figure 1.

TABLE 1
WHAT THE LEADERS CONSIDERED THEIR GREATEST ACHIEVEMENT

Greatest Achievements	
Wellbeing of people	36
Start, turnaround or complete venture	35
Family	14
Doing the right thing	14
Doing what I love	12
Giving appreciation	9
Understanding self	7
Earning trust	6
Recognition	5

FIGURE 1
WHAT THE LEADERS CONSIDERED THEIR GREATEST ACHIEVEMENT



Discussing the Themes

Wellbeing of People

From the initial analysis it became obvious that a majority of the interviewed leaders reflected on the wellbeing of people as their most important achievement. Below are some examples of how this perspective was worded:

> "I think the most important achievement is to see that the people that I have interacted with fulfill their mission and become successful in their own right."
> "My staff set this goal and then worked their tails off to achieve it. This is the greatest achievement of my 30-year career with [this company]"
> "The Association will be able to offer daily feeding programs, as well as training and literacy programs that will help the people move out of abject poverty."
> "Completing so many projects in my lifetime is certainly a great accomplishment. But perhaps even more than that, my greatest achievement is really having made so many good friends along the way."
> "My greatest achievement would be coordinating the diverse constituencies of [my organization] in order to balance the specific needs of the faculty, administrators, students, alumni, trustees, donors, community leaders and parents."
> "My greatest achievement is helping clients overcome their financial difficulties."

Wellbeing of people should not be underestimated as an achievement and a leader's purpose. McMurray, Pirola-Merlo, Sarros, and Islam (2010) conducted a study in which they found that there is a direct link between employees' wellbeing and their leader's behavior. Prior to the study by McMurray et al, a similar finding was published by Van Dierendonck, Haynes, Borril, and Stride, (2004), who conducted a longitudinal study in the UK and found that followers with active, supportive leaders, reported higher levels of wellbeing.

Start, Turnaround or Completion of a Venture

Close to the most often mentioned theme was one that comprised of the start, turnaround or completion of a venture. The leaders who included these action-oriented accomplishments often combined them with other themes. However, when focusing on this aspect, they provided feats such as the following:

> "Opening my own business: my restaurant. I had wanted my own restaurant for many years. I worked in a large chain for 32 years, but to start from the bottom up after all that time, create my own dream, develop a menu, decide on a theme and décor set up, the kitchen… this was very challenging and rewarding."
> "I started from scratch 17 years ago and my mission was not profit or lucre but to build quality human capital for the service industry and other economic activities. During these years more than 20, 000 students passed out from our institution and fortunately all of them are now occupying suitable positions in the country and even many are happily settled overseas."
> "[…], my greatest achievement so far is moving beyond uncertainty and fear and starting multiple businesses that help others find their own success."
> "My greatest achievement so far is still a "work-in-process". I'm not the brilliant inventor of our technology […]. Rather, as my partners describe it, I'm the inventor of the relationship amongst all of us."

What has turned out to be a recurring factor in many of the responses from leaders who mentioned the start or completion of a venture or project was their involvement of the people aspect in that, as can be gleaned from three of the four sample statements above.

According to Fernald, Solomon, and Tarabishy (2005) leaders should maintain an entrepreneurial spirit as well. They add that vision, problem-solving skills, decision making, risk taking, and strategic initiatives are imperative in this regard. The leaders who mentioned achievements in the area of starting, turning around or completing a venture also considered these qualities essential and applied them in attaining their goals.

Doing the Right Thing

While not as abundantly mentioned as the first two themes, "doing the right things" still turned out to be embedded in many of the perspectives of the interviewed leaders on their achievements. The researcher intended the theme category "doing the right thing" to include statements that implied a sense of gratification from doing something that had a positive effect on the self and others in the same trend of what is referred in Buddhism as "right livelihood." Valliere (2008) defines right livelihood in line with the perspectives of the Right Livelihood Association and the Vipassana Fellowship translations of the Pali Canon, and presents it as follows, "[E]arning a living responsibly, accepting the consequences of one's actions; in a righteous way, acquired only by legal means and taking only a fair share of the earth's resources; peacefully, without coercion or violence; honestly, not by trickery or deceit; and in ways which do not entail harm and suffering for others" (p. 174). Capturing this perceived achievement happened, for example, this way:

> "In business perspective [my greatest achievement] would be the process of redefining myself, from a very conventional multi-business entrepreneur […] to a more holistic oriented and spiritually attuned social entrepreneur..."
> "I think my greatest achievement has been to remain faithful to my vision and the promise of change in each career I have pursued. This has not been the easy path, as this secular, money driven world does not tend to welcome individuals with a vision or and it does not tend to welcome individuals with a passion that surpasses 'practicality'."

> "I am particularly proud to number among my closest friends, people who, though once required to report to me in a professional or business context, still kept in touch with me even when I'm no longer the "boss." Building teams through the years required some "tough love" and when folks who I mentored or trained, with the belief that I was perhaps being too tough, tell me they were grateful for the "education" and remain my friends, that's the achievement that gives me the greatest pleasure. As one's career progresses, one has to come to terms with one's mortality. Material goods become less and less important and the intangibles are all that's left."

From the responses above it may become clear to the reader why the researcher needs to immerse in this type of data in order to distill the themes. Not all themes are as apparent at first glance, but require interpretation of the way they are described, since different people use different words to indicate something similar.

Doing the right thing is more critical today than it has ever been before. When contemplating on this theme, leaders should be reviewing their actions from a macro view, and forego the traditional tendency to prioritize. Pearson (2010) discusses the issue of doing the right thing as a conscious question to leaders that earn their livelihood in the sustainability sector, but his reasons are applicable to leaders in any industry. Pearson shares the viewpoint that, if leaders sell a product or service - regardless of how important, superior, or responsible - without educating people at the same time on how to live more responsibly overall, they are not doing the right thing. Pearson's point is, indeed, important food for thought to all of us.

Family

The fact that the theme "family," was not as frequently mentioned as the two outliers may be explained by the fact that many of the leaders may have thought that they should limit their responses to the professional area of their lives. Those who explicitly included their family as an achievement presented statements such as the ones below:

> "Even more important than business is the pride I feel in being a successful father. My relationship with my children is wonderful. Each of them possesses admirable qualities and they lead successful lives. I am blessed to have a lengthy marriage characterized by love and respect."
> "My greatest achievement would most definitely be becoming both a husband and a father. I came from a difficult situation in my past, which led to my being homeless and isolated. The thought of becoming a father seemed like an impossible dream. The fact that my wife and kids love me is a testimony of God's power to change lives."
> "Raising two wonderful daughters that are happy and successful and the relationship I have with my wife."
> "In personal perspective [my greatest achievement] would be, raising my three children to adulthood, and contributing to the wellbeing of several more."

While the influence of family in leaders' lives is not one of the most popular research topics, there has been some examination done in the area of employees' family in relation to their work environment. Culbertson, Huffman and Alden-Anderson (2010) affirm that leaders are considered highly influential in their employees' lives, so their willingness and understanding toward family relationships will enhance workers' loyalty, input, and general wellbeing. Along similar lines, Hsu, Wan-Yu, Wang, and Yen-Yu (2010) stress that work-family conflicts cause a broad scale of negative effects, while facilitation can help boost production and overall wellbeing. These research findings underscore the assertions that leaders who recognize their family as a great asset will have similar perspectives toward their employees and their families. Hence, these leaders may be able to establish deeper relationships and maintain happier co-workers.

Doing What I Love

From the earlier presented definition of right livelihood it may become apparent that this is not necessarily the same as doing what one loves. A person could engage in rather destructive activities and love that. Fortunately, there were no signs of destructive behavior in these leaders. The way they phrased this theme can be garnered from the following examples:

> "… [M]y greatest success has been my ability to successfully participate in so many different roles - whether it was running my own consulting practice, being part of the entitlement team for Staples Center, running a casino, starting a corporate foundation. I have been blessed with wonderful opportunities."
> "I've re-invented myself according to my interests three times in the 20 years since I graduated college. I spent seven years in technology working in international business development and also in the internal M&A group, six as a partner in a management consulting practice, five as a non-profit executive, and now in addition to consulting again, I am developing alternative energy, energy-efficiency and sustainability projects. I've had the good fortune to be able to do each of the things professionally that I have thus far felt inspired to do and I consider that a great achievement."
> "… I take great delight in speaking at conferences, working with teams, and doing one-on-one coaching. I am building an international organization with affiliated consultants and coaches, and seldom feel much fear at all."

When leaders do what they love, they are able to make huge leaps ahead, even though they are not free of stress and occasional setbacks. Secretan (2006) makes a strong point about leaders who exercise and nurture their passion, and can instigate tremendous changes that way. As an example he mentioned John Kennedy, who had a dream, which became his passion, and ended in a man actually walking on the moon. While the dreams of many leaders may not have such a historical impact, they contribute to a happier world, because leaders who do what they love carry less stress and exude more happiness and understanding to others.

Giving Appreciation

The theme of "giving appreciation" was not as easily noticeable as others, because it was interwoven into others. However, there were leaders who made it very clear that they considered their appreciation for their life and work their greatest achievement. The statements below provide an example:

> "The absolute and total experience of my long-held belief that love is everything. Of course, this has not been my achievement – it has been my experience -- and for that illuminating gift I have deep gratitude."
> "Well, I was born in a good place at the right time. That's my achievement. If I had been born earlier, people would not have understood what I am trying to do. And if I had been born later, what I am doing might not seem so unusual. So I was born at the right time, in the right place, as my father's and my mother's son -and with enough background, and enough financially to help me do well in business. So that's my greatest achievement - and I myself had nothing to do with it!"
> "This is a very difficult question to answer because all of my achievements can be contributed to a team effort. I have done nothing totally alone but numerous goals have been reached through the efforts of many."

Appreciative leaders are well aware of alternatives, which is why they appreciate their lives, circumstances and those around them so much. Appreciation is also becoming an increasingly important quality looked for in leaders. In a survey among mid-career business professionals in the Boston area, Quaglieri, Penney, and Waldner, (2007) found that one of the traits these workforce members considered

important in leadership was appreciation, especially when it pertained shifting trends in the workplace, such as diversity.

Understanding Self

The leaders that provided this aspect in their answers, oftentimes alongside other themes, referred to a sense of awakening to their preferences and talents, and focusing on those as their achievement. The following examples illustrate that:

> "In my thirties I realized that I am an out-of-the-box thinker: curious, progressive, and a quiet leader. All these years later, I believe I have used these qualities to their highest good and I continue to do so with peace and confidence."
> "Early in my career […] I discovered that many of my colleagues were dissatisfied with leadership in the workplace. Yet, they were hesitant to explore other employment opportunities because of a fear of change or a potential loss of income. So, my greatest achievement so far is moving beyond uncertainty and fear and starting multiple businesses that help others find their own success."
> "I think my greatest gift is to help others connect to their inner greatness, to help others discover their authentic voice, and to help others be fulfilled. This is what I do best. That's my niche. I think there comes a time when one starts focusing more on helping others achieve their goals rather than building one's own resume."

Fernald, Solomon, and Tarabishy (2005) accentuate the essence of understanding oneself, especially when in a leadership position. They assert that leaders are "twice born" (p. 3), because they go through critical challenges, which drive them to turn inward and then re-emerge with a newly defined identity, which seems to be a critical aspect for successful leading. They conclude, "Leaders have self-confidence growing out of the awareness of who they are and the visions that drive them to achieve" (p. 3).

Earning Trust

While many of the leaders' statements alluded to trust relationships, some made this theme more prominent than others. Examples are below:

> "To have the trust of others is, I believe, a great achievement and something to live up to and to treasure. If I died today, I would feel my greatest achievement is the wonderful people I have in my life. If I die 10, 20, 30 years from now, I would hope to feel the same."
> "Learning to relate to a dramatically different culture and to contend with unfamiliar codes and techniques was fraught with risk, and yet, due to the deeply held values we shared with our client, and the significant degree to which he trusted our architectural judgment, the project was an outstanding success. One we are sure will continue to enliven the narrow Tokyo streets of Shinjuku for a long time to come."
> "Guided by the concept of 'The letter killeth and the spirit keepeth alive,' I have been successful in handshake and trusting agreements in America and the world at large. Whether dealing with vary large labor unions in North America or Pacific Rim companies, I have never felt the need for litigious and unnecessary written agreements to achieve consensus. Lyndon Johnson, while in no way my idol, seemed to work effectively in this mode. My approach is often scoffed at and criticized but it works for me and has carried me through when compromise seemed impossible. One caveat: I would suggest that none adopt my philosophy on a situational basis."

Without shortchanging any other quality or achievement, trust may be considered one of the most critical aspects in successful leadership. When a leader has earned the trust of his or her co-workers, there

is so much more possible, because the people don't question every step the leader takes anymore. Ceri-Booms (2010) likens the concept trust to interpersonal trust in its nature. Similar to the awareness of family-facilitation, employees will be more appreciative and supportive toward leaders whom they feel to be trustworthy. Trust is not something we attain lightly, so it should be cherished and carefully guarded. Plinio, Young, and Lavery (2010) express their concerns about the low levels of trust that still exist in business corporations today, and link this factor directly to ethics: when ethical behavior is questionable, stakeholders lose trust in their leaders.

Recognition

The theme of "recognition" was a very diverse one, as it pertained to recognition received by individuals or institutions, and on personal or professional grounds. The examples below may illustrate:

> "I consider it a major achievement when after 21 years a leading community activist remarks at a luncheon that she was introduced to [our publication] when we published a story on her, which she read while recovering from an illness in a local hospital. After being discharged, she stopped by the office for extra copies, commenting that she had talked to my secretary and how pleasant she was. I commented that that wasn't my secretary, but my wife. We have become dear friends since, just like we have with many others throughout the community we serve. "
> "Two years ago, my team launched the Parent Center Institute that continually reviews current research and seeks to improve the practice of the 85 schools we serve in the area of parent education and engagement. This year, the institute won a national award for its work in the district."
> "I think another significant achievement was that I was decorated by the emperor of Japan. That was a very humbling experience: to be decorated as a non-Japanese by the emperor of Japan. An acknowledgement of what I had done in terms of Japan - US relationships. That was very humbling."

Recognition is not just wonderful to receive but even greater to give. It establishes a mutual sense of appreciation or, as an old adage goes, "a little bit of the fragrance sticks with the hand that gives the flowers." Drennan and Richey (2012) remind us that there are five leading strategies for motivating a group toward a common goal: "1) Giving positive recognition; 2) Building teams; 3) Setting team goals; 4) Keeping score publicly; [and] 5) Positioning supervisors as trainers" (p. 61).

Further Clustering the Themes

In order to enhance clarity in the data analysis process, the researcher critically examined the initial list of themes in order to engage in what is known in the phenomenological study trend as "phenomenological reduction" and "theme clustering" (Creswell, 1998, 2007). In a phenomenological study, the researcher is considered the main instrument. For that reason, he or she should exclude ("bracket") his or her opinions in the data gathering process. However, once the data is transcribed, the researcher has to immerse into the findings, in order to interpret these and cluster themes with similar meanings. The intention of this process is to arrive at overarching results, which can be presented as the main findings.

Main Theme 1: Relationships

When reviewing the themes discussed above, the researcher found that the themes "Wellbeing of people" and "family," shared the main aspect of care for other beings. What exuded from the comments in both categories was the fact that these leaders considered their relationships, whether at work or home, to be important. The resulting theme was therefore simply labeled as "Relationships" and can be seen as one that bridges the leaders' personal and professional performance.

Main Theme 2: Professional Growth

Along the same lines, the researcher concluded that the themes, "Start, turnaround or completion of a venture" and "Recognition" were consistently referring to professional attainments: heights in the leaders' careers that they were rightfully proud of. Therefore, these two themes were clustered as the main theme, "professional growth."

Main Theme 3: Personal Mastery

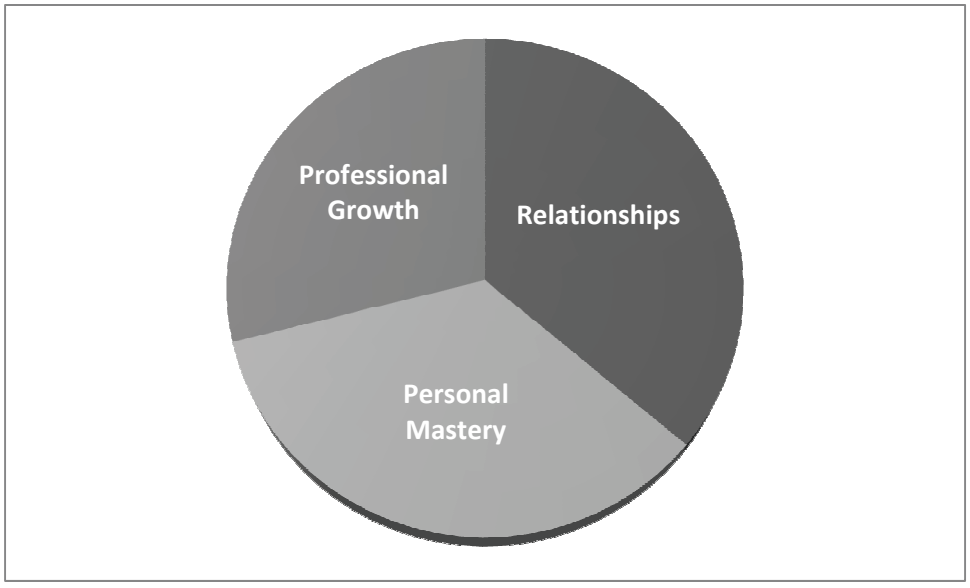
Once the two main themes above were extracted, it turned out that all other themes shared the core feature of personal growth. These themes were, "Doing the right thing," "Doing what I love," "Giving appreciation," "Understanding self," "Earning trust," and "Recognition." It needs to be stated that there are fine lines between many of the themes. For example, the theme "Earning trust" could easily be included in main theme 2, but was included here instead because it referred to an internal awareness as well, in a similar vein as "Doing the right thing".

Table 2 and figure 2 present the ultimate results of the theme clustering process. It should be, again, underscored that the number of themes exceed the number of leaders interviewed, because many leaders referred to multiple themes as their greatest achievements.

TABLE 2
LEADERS' ACHIEVEMENTS CLUSTERED

Greatest Achievements	
Relationships	50
Personal Mastery	48
Professional growth	40

FIGURE 2
LEADERS' ACHIEVEMENTS CLUSTERED



CONCLUSION

If there is one important conclusion to be drawn from this study, it is the fact that none of the leaders attached a dollar value to their achievements. They did not refer to financial windfalls or major bank accounts as their greatest achievements. Rather, their perceptions on achievements were concentrated in creating something new or bringing a project or venture to fruition (professional growth), learning to understand themselves and their passion and focusing on that (personal mastery), and establishing constructive relationships, whether in the professional or private areas of their lives.

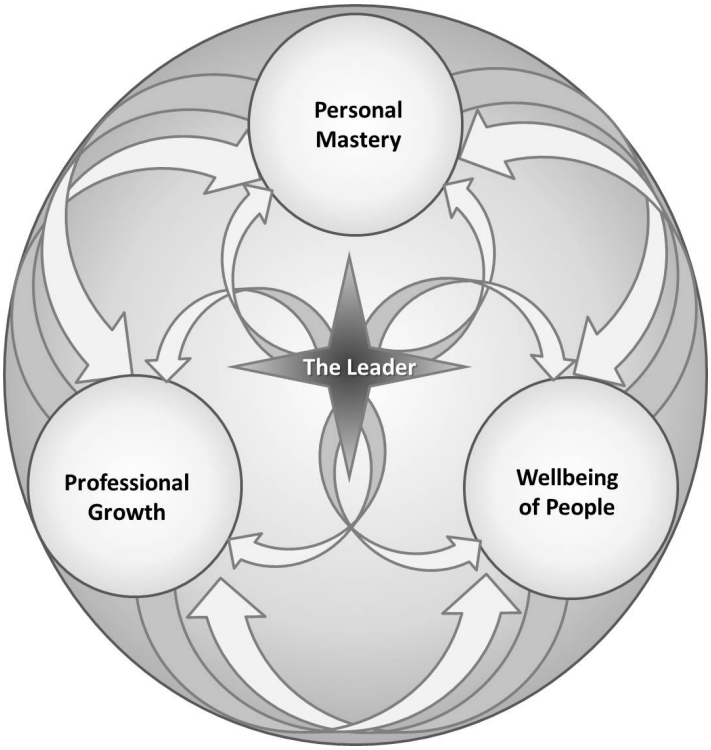
This key finding, which is a direct result of reviewing the clustered achievement categories of the leaders interviewed, is an important finding, as it indicates that these individuals were well-aware of what really mattered in their own lives, those they interacted with, and those whom they did not know, but whose lives they influenced in the short or long term. These findings also indicate that the leaders interviewed were capable of transcending the trivial day-to-day strife and focus on the biggest picture of what they considered their life's purpose. They then connected their achievements to this self-formulated purpose, and presented a mosaic of themes with a remarkably consistent theme: doing well by doing good.

In their review of leadership as a developmental process, Mostovicz, Kakabadse, and Kakabadse (2009) affirm, "[I]n leadership theory the "what" represents the goal that the leader looks to attain, the "how" explains the way the leader reaches the goal, and the "why" explains the reasons behind selecting this particular method for attaining the goal" (p. 565). When mirroring these three aspects on the three main achievement theme clusters that emerged from this study, it turns out that there are multiple substitutions possible:

- Focusing on professional growth (goal), leaders should engage in constructive relationships (how), in the awareness that this also enhances personal mastery (reason).
- Focusing on personal mastery (goal), leaders should engage in constructive relationships (how), in the awareness that this also enhances professional growth (reason).
- Focusing on constructive relationships (goal), leaders should engage in personal mastery (how), in the awareness that this also enhances professional growth (reason).
- Focusing on constructive relationships (goal), leaders should engage in personal mastery (how), in the awareness that this also enhances professional growth (reason).

Each of these three themes should, of course, be implemented with consideration of the other two. Figure 3 illustrates this interplay.

FIGURE 3
GOAL, PATH, AND PURPOSE OF THE LEADER



The intention of this article was to illustrate the overarching themes that leaders listed as their major achievements in life, representing a broad divergence of areas, but a common lack of short-term, profit-driven feats. The hope is that future researchers will consider engaging in similar studies in other parts of the world or on a larger scale to find out if the responses are comparable. It is also the hope that scholars and leaders will decide to consider these achievement themes as potential options for a possible revision of their own, in case they have been dissatisfied so far with their prior achievement criteria.

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Modeling Deposit-Withdrawal Behavior with Risk Tolerance

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In this study, we model and analyze individual's withdrawal behavior with risk tolerance. Consequently, it is found the followings: 1) effects of psychological factors such as degree of trust in information sources and degree of risk aversion are not uniformly against individual's deposit-withdrawal behavior, 2) the probability that they carelessly withdraw their deposits tends to be lower if individuals correctly understand Japanese deposit insurance scheme, and 3) annual income affects individual's deposit-withdrawal behavior, but total amount of his/her deposit and the number of accounting do not affect it. From these findings, we propose that the government and financial institutes implement the measure which promotes to let understand Japanese deposit insurance scheme to depositors.

INTRODUCTION

The Research Institute for Socionetwork Strategies (RISS), Kansai University, Japan has one project with regard to Japanese depositor's behavior, and we investigated factors affecting to the behavior (Yada et al., 2008, 2009, 2010; Takemura and Kozu, 2009, 2010; Takemura, et al., 2011). These studies provide the information for financial institutions' quick response to the contingency situation such as bank run and discuss the efficiency of Japanese deposit insurance scheme.

We have some theoretical studies on bank run (See Gorton and Winton, 2002). Diamond and Dybvig (1983) is the very famous and one of pioneering studies. They approach to the depositors' behaviors from game theory and then show multiple equilibria; one equilibrium is the situation that depositors' coordination is success, and the other is the situation that their coordination is failure. Then, it is silent which equilibrium is selected. This kind of study provides the useful method to know and clarify the mechanism of bank run, but cannot provide us what the measure we should implement is and the impact of the measures.

On the other hand, we have empirical studies on bank run or finance crisis approaching from econometrics and micro econometrics. Their topics are tightening of regulations, the soundness of financial institutions, and the effectiveness of financial policies. Their targets are financial institutions, government and central bank. Therefore, it is not necessarily the case that depositors' behaviors are incorporated in their economic modeling. The reason is simple. The financial reports or IR reports of

financial institutions are disclosed publicly, but it is difficult to gain the micro data of depositors.

In U.S.A., Kelly and Ó Grada (2000) and Ó Grada and White (2001) are valuable empirical studies on bank run. They gained micro data with regard to depositors of when bank runs occurred twice in 1850s, and analyze the data. They clarify that the length of opening of their accounts and hometown impact to their deposit-withdrawal behaviors by running logistic regression analysis, and show the panic process of the social contagion by using classification tree.

Japan experience some bank runs in the past. However, as far as we know, in Japan we have no empirical studies such as Kelly and Ó Grada (2000). As soon as not, with a crow's nest view of some case studies on bank run in Japan, many of studies provide various lessons (Nagaoka and Takemura, 2009). Besides, there are few empirical studies because we had a barrier of collecting micro data of depositors.

For overcoming the barrier, RISS regularly conduct the Internet survey on depositor's behavior in Japan and build the database. This challenging quantitatively enables to analyze the mechanism of bank run. For example, Yada et al (2008, 2009) clarify that by using data mining technique, deposit-withdrawal behavior are impacted to by factors such as understanding of the Japanese deposit insurance scheme, living area and the degree of trust in information source. In addition, they would estimate the total amount of depositors prepared at each branch if bank run occurred. Takemura and Kozu (2009) clarify that by running stepwise logistic regression analysis, factors such as understanding of the Japanese deposit insurance scheme, the degree of trust in information source and the frequency of accessing the source impact to the withdrawal behavior. Besides, it is found that understanding the Japanese deposit insurance scheme can avoid the inadvertent deposit-withdrawal behavior even if depositors receive any information, and that degree of trust in information sources or frequency of accessing the sources does not uniformly affect withdrawal behavior and by features of the degree or the frequency the effects are different even if information source is the same.

In this study, we attempt to model behavior of individual who tends to withdraw her deposit at first after receiving a kind of information with regard to financial turmoil. This behavioral modeling provides richer results and information than Takemura and Kozu (2010) and Takemura, Kozu and Kobayashi (2011). In addition, we conduct simple and straightforward simulation.

FRAMEWORK

Behavioral Modeling

For example, suppose that an individual receives the information which the probability that her financial institute fails is 5%. Then, one individual would judge not to need to withdraw her deposit if the probability is just 5%, the other would judge to withdraw her deposit as soon as possible. Besides, an individual would judge not to withdraw his deposit if the probability is 1%, but he would judge to withdraw his deposit if the probability is 5%. Takemura and Kozu (2010) and Takemura, Kozu and Kobayashi (2011) cannot model this kind of deposit-withdrawal behavior well. In their modeling, population which consists of individuals who tend to withdraw their deposits given the probability of failure of bank is 5% logically includes individuals who tend to withdraw their deposits given the probability is 1%. In this study, in accord with this point, we model decision-making of whether or not individual who tends to withdraw her deposit at first after receiving a kind of information with regard to financial turmoil, not decision-making of whether or not individual withdraw his deposit after receiving the information with regard to financial turmoil. In other words, in this model the probability of failure of bank that depositor can perceive is able to be regarded as a kind of risk tolerance.

For the simplification of modeling, we assume that individual have three alternatives; 1: withdrawing at low-level of the probability, 2: withdrawing at middle-level of the probability, and 3: withdrawing at high-level of the probability. It is interpreted that individual who selects alternative 1 may tend to run a bank, and that individual who selects alternative 3 may tend not to run a bank. These alternatives are mutually exclusive and are regarded as ordered alternatives from the perspective of risk tolerance.

We analyze Japanese depositors' behaviors about these alternatives by running stepwise ordered logit analysis. Any stepwise procedure for selection or deletion of variables from a model is based on a

statistical algorithm that checks for the importance of variables and either includes or excludes them on the basis of a fixed decision rule. Employing a stepwise selection procedure can provide a fast and effective means to screen a large number of variables and to fit a number of logistic regression equations simultaneously. In this study, especially, we use backward selection procedure. Backward selection is to fit the full model on all explanatory variables at first step and remove the least-significant term and re-estimate while it is insignificant (Hosmer and Lemeshow, 2000).

Design of Survey and Data Set

Design of Survey

At recent years, we can often see results of the Internet surveys in reports of some Japanese public offices. The Japan Institute for Labor Policy and Training (2005) and Ishida et al. (2009) discuss the pros and cons of usage of micro data from the Internet survey. Though, we cannot obtain the clear conclusion still now. At the current moment, though statistical problem on representativeness of data remains, compared with classical social survey we point out the following characteristics:

1) It is able to obtain the desired sample size for statistical analysis.
2) Imposing conditions on attributes of respondents beforehand has a prediction for Bayesian approach.
3) Because the Internet survey agilely is conducted, it is easy to collect data set for analysis.

Therefore, we interpret and analyze data from population of Japanese registered with the Internet survey company. Of course, we must discuss the accuracy of the survey. In near future, we will need to expand the scope of the utilization of the data from the Internet survey.

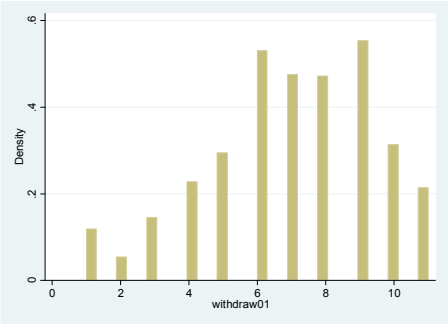
We use data collected from the Internet survey "the survey on depositors' behavior in Japan" conducted in March, 2010. The subjects of this survey are Japanese depositors who have more than one bank account, are more than 20 years old. Because bias of respondents occurs by day and time zone that survey is conducted, samples of this survey are arranged according to three dimensions; gender, age and living area in Japan. To arrange three dimensions, we use the data on the number of population by age group and prefecture divisions in "the number of population and household movements based on basic resident registration on the 31st, March, 2008" which the Ministry of Internal Affairs and Communications in Japanese provides.

The aim of this survey is to capture individual deposit withdrawal behavior from the viewpoints of economics and psychology. This survey asks more than 50 question items such as gender, annual income, degree of risk aversion, the number of friends and so on. This survey includes 3,096 respondents. Note that you can see this survey slip at RISS's Website (URL: http://www.kansai-u.ac.jp/riss /en/shareduse/ database.html).

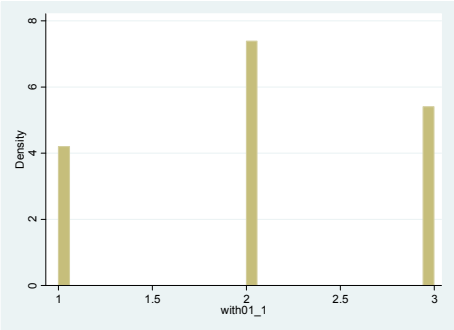
Data Set

In this survey, we ask about the event that an individual withdraw his entire deposit after receiving information on the probability of failure of his bank, k% (for k=0.1, 0.5, 1, 2, 5, 10, 20, 30, 50, 99). See Figure 1-(a). From this questionnaire, we can make three alternatives as explained variable; 1: withdrawing at low-level of the probability, 2: withdrawing at middle-level of the probability, and 3: withdrawing at high-level of the probability. In this study, the low-level of the probability is less than 5%, the middle-level of the probability is 5-30% and the high-level of the probability is over 30%. Each level corresponds to alternative 1-3 (See Figure 1-(b)). Note that alternative 3 includes the case that individual would not withdraw his deposit even if the probability of failure of bank is 99%.

FIGURE 1
DISTRIBUTION OF DEPOSIT-WITHDRAWAL BEHAVIOR



(a)



(b)

Table 1 show a list of explanatory variables. We select these variables based on variables used in Takemura and Kozu (2010) and add some variables such as anxiety and occupation. In addition, we use multiple degrees of risk aversion and time discount rates. Variables regarding with Living area, education and occupation is dummy variables.

In similar to Takemura, Kozu and Kobayashi (2011), we use the degree of trust in the information sources for bad news and the frequency of accessing the sources as explanatory variables.

In the Japanese deposit insurance scheme, under some conditions, up to 10 million yen of insurance per one depositor would be paid. Thus, the purpose of the scheme is avoiding bank run at any risk. Actually, in some pervious literatures, it is found that understanding the scheme is useful and effective. Figure 2 shows understanding of the Japanese deposit insurance scheme.

From the result of the survey, 51.9% of respondents answered that they know the scheme, but do not consider it in their actions. This result has the same tendency with the result of 3rd consumer survey on finance, which the central council for financial services information conducted (URL: http://www.shiruporuto.jp/finance/chosa/enqu2008/index.html). It is noted that this study does not regard these answers as understanding the scheme and the respondents are included in no understanding in Figure 2.

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TABLE 1
A LIST OF EXPLANATORY VARIABLES

	Contents	Items
Gender	Gender	0: Male: 1: Female
Age	Age	Age
It_i	Degree of trust in the information source	How do you trust the following information sources? 1) TV news program 2) TV wide show program 3) Newspaper 4) The Internet excluding 2-channel 5) 2-channel 6) Conversation with neighbors 7) Conversation with people at workplace 8) E-mail or phone call with friends 9) Radio program 10) Weekly/monthly magazines 11) Conversation of strangers 1: I never trust it, 2: I do not trust it at all, 3: I am indifferent of trusting it, 4: I weakly trust it, 5: I strongly trust it
Ia_i	Frequency of accessing the information source	How often do you access the above information sources? 1: Few 2: 1-2 days/week 3: 3-4 days/week 4: 5-6 days/ week 5: Every day
Ujps	Understanding of Japanese deposit insurance scheme	Do you understand the Japanese deposit insurance scheme? 0: No, 1: Yes
E_mass	Effects from mass media	Do you withdraw your deposit when you receive the information regard with financial turmoil from mass media? 1: I never think so 2: I do not think so 3: I am indifferent of thinking so 4: I think so 5: I strongly think so
Ra_i	Degree of risk aversion	1: Pricing the lottery (1%) of 100,000 yen 2: Pricing the insurance to theft (1%) of 100,000 yen
Tp_i	Time discount rate	Compared receiving 10,000 yen now is indifferent with receiving some amount of money after 1 week 1: interest 0% 2: interest 2% 3: interest 6% 4: interest 10% 5: interest 20%
Gt	Degree of trust in government:	Even if main bank fails, I believe that government grantees my deposit. 1: I strictly believe 2: I weakly believe 3: I am indifferent of believing 4: I do not believe 5: I never believe
Exp_eg	Expected economic growth rate	How are your expected economic growth rate in the future 10 years?
Exp_pr	Expected inflation rate	Expected inflation rate in the future 10 years
Income	Annual income (yen)	1: under 0.5 million 2: 0.5-1 million 3: 1-2 million 4: 2-3 million 5: 3-5 million 6: 5-7 million 7: 7-10 million 8: 10-15 million 9: over 15 million
Deposit	The amount of deposit (yen)	1: 0-0.1 million 2: 0.1-0.5 million 3: 0.5-1 million 4: 1-2 million 5: 2-3 million 6: 3-5 million 7: 5-7 million 8: 7-10 million 9: 10-15 million 10: over 15 million
Debt	The amount of debt (yen)	1: 0 2: 0-0.5 million 3: 0.5-1 million 4: 1-2 million 5: 2-3 million 6: 3-5 million 7: 5-7 million 8: 7-10 million 9: 10-15 million 10: 15-30 million 11: over 30 million
Account	# of account	The number of bank account
Unsat_i	Degree of anxiety	Items of anxiety 1) Living are 2) Work 3) Own future 4) Future of Japan 5) Japanese economic condition 6) Home life 7) Financial situation of family 8) Relationships with friends 9) Condition of health 1: I never feel anxiety 2: I do not feel anxiety 3: I do not almost feel anxiety 4: I am indifferent of feeling anxiety 5: I feel kind of anxiety 6: I feel anxiety 7: I strictly feel anxiety
Friend_i	Effects from friends	1: The rate of friends or colleagues bandying about failure of bank 2: The rate of friends or colleagues withdrawing their deposits
D_area_i	Living area	1: Hokkaido-Tohoku area 2: Kanto area excluding Tokyo 3: Tokyo area 4: Hokuriku area 5: Tokai area 6: Kinki area 7: Chugoku area 8: Shikoku area 9: Kyushu area
D_edu_i	Education	Education: 1: Elementary / middle school 2: High school 3: Junior college 4: University and graduate school.
D_work_i	Occupation	1: Regular employer 2: Irregular employer 3: Self-employed individual / company executive 4: Housewife / househusband / student 5: Others including unemployed persons

*: We omit D_area_7, D_edu_3, D_work_2 from our analysis

FIGURE 2
UNDERSTANDING OF THE JAPANESE DEPOSIT INSURANCE SCHEME

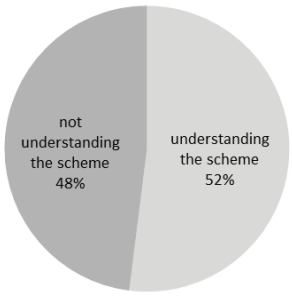
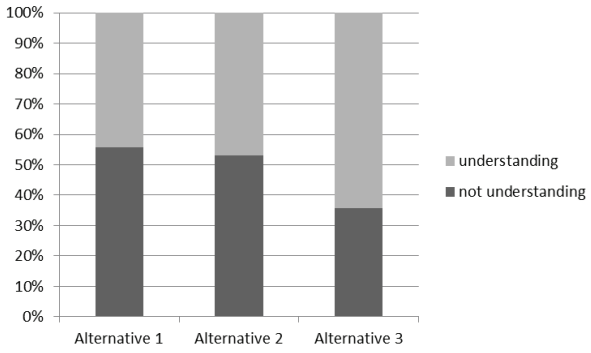


FIGURE 3
RELATION BETWEEN DEPOSIT-WITHDRAWAL BEHAVIOR AND THE UNDERSTANDING OF THE SCHEME



Besides, Figure 3 shows elation between deposit-withdrawal behavior and the understanding of the scheme. We can know that about 64% of respondents who tend to withdraw their deposits at the high-level of the probability understand the Japanese deposit insurance scheme. On the other hand, in the other cases the ratio of respondents understanding the scheme is around 45%.

Under the scheme, total amount of deposit which about 91.5% of respondents are protected (See Figure 4). So, almost respondents need not to withdraw their deposits even if the financial institute failed. However, as you seen in Figure 2, respondents tend to withdraw their deposits after receiving some probabilities of failure of bank. In addition, Figure 5 shows the distribution of annual income and we find about 88.4% of respondents' annual incomes are less than 7 million yen.

We use two kinds of degrees of risk aversion and three kinds of time discount rates in this study. These variables are calculated by some questionnaires in the survey. About details of the method, refer to Ohtake and Tsutsui (2004). In addition, we use nine kinds of degrees of anxiety in Ohtake, Shiraishi and Tsutsui (2010) as explanatory variables.

In history, Japan had experiments that bank runs occurred by the rumor among persons although their management was healthy (Toyokawa Shinkin in 1973 and Saga bank in 2003). These cases may imply that human network or social contagion impact to the deposit-withdrawal behavior. As mentioned above, Kelly and Ó Granda (2000) clarify the panic process of social contagion.

FIGURE 4
DISTRIBUTION OF AMOUNT OF DEPOSIT

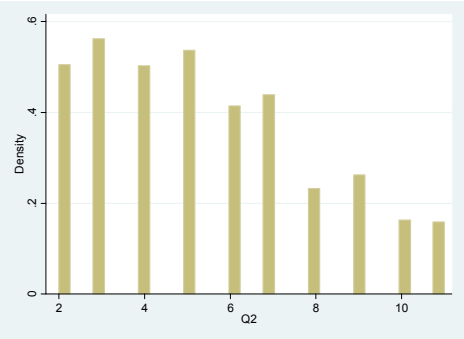


FIGURE 5
DISTRIBUTION OF ANNUAL INCOME

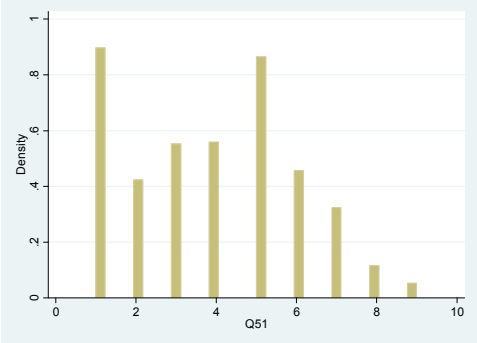


TABLE 2
THE DESCRIPTIVE STATISTICS WITH REGARDING TO THE FRIENDS AFFECTING THE BEHAVIOR

	Mean	Std.Dev.	Min	Max
# of friends	11.681	35.646	1	1510
the rate of friends or colleagues bandying about failure of bank	0.360	0.364	0.0	1.0
the rate of friends or colleagues withdrawing their deposits	0.338	0.351	0.0	1.0

In "the survey on depositors' behavior in Japan", we ask about the number of friends or colleagues bandying about failure of bank and the number of friends or colleagues withdrawing their deposits (affecting their behaviors) in addition to the number of friends or colleagues (The survey has 316 respondents who answer to not interact with another person. In this study, we omit them from the data for analysis). Table 2 shows the statistics regarding with the number of friends, rates of friends or colleagues bandying about failure of bank and withdrawing their deposits.

RESULTS

First of all, we need to set criteria (p-value) of removing insignificant variables in stepwise ordered logit model (Hosmer and Lemeshow, 2000). In this study, we set p=0.10 as criteria. Table 3 shows the

estimated result. First, we enter 64 explanatory variables in Table 1, and the number of variables that are not removed is eventually 17. In this study, Stata 11/SE is used as statistical analysis software.

TABLE 3
ESTIMATED RESULT

	Coef.	Robust Std. Err.	z	p>|z|
b_Gender	0.168	0.090	1.86	0.063
b_Age	-0.008	0.003	-3.03	0.002
b_It_3	0.141	0.048	2.92	0.004
b_It_7	0.106	0.063	1.69	0.092
b_It_8	-0.243	0.063	-3.84	0.000
b_It_11	-0.097	0.054	-1.78	0.076
b_Ia_1	0.106	0.037	2.84	0.005
b_Ia_4	0.045	0.026	1.71	0.087
b_Ia_5	-0.067	0.038	-1.75	0.08
b_Ujps	0.470	0.078	6.02	0.000
b_E_mass	-0.992	0.048	-20.51	0.000
b_Ra_1	8457.994	4604.769	1.84	0.066
b_Gt	0.209	0.036	5.73	0.000
b_Exp_eg	0.013	0.005	2.52	0.012
b_Income	-0.055	0.021	-2.56	0.011
b_Unsat_7	-0.082	0.038	-2.13	0.033
b_Friend_2	0.220	0.109	2.03	0.043
/cut1	-4.291	0.354		
/cut2	-2.011	0.345		
Number of obs =2780 Log pseudolikelihood = -2610.4757 Wald chi2 (17) = 640.57 Pr > chi2=0.0000 Pseudo R2 = 0.1240				

The positive distinction rate in this model turns out to be about 54 %. 1st cut-off point and 2nd cut-off point are -4.29 and -2.01, respectively. If sum of potential variable (coefficient X sum of explanatory variables) and errors is less than value of 1st cut-off point, individual would tend to withdraw the deposit at the low-level of the probability. If the value is in between the 1st cut-off and 2nd cut-off point, individual would tend to withdraw the deposit at the middle-level of the probability. Otherwise, individual would tend to withdraw the deposit at the high-level of the probability.

First of all, we find that male tends to withdraw his deposit rather than female. Besides, the elder individual tends to withdraw his deposit.

Next, the higher degree of trust in the information sources such as newspaper and conversation with people at workplace are, the less individuals tend to withdraw his deposit. Conversely, the higher degree of trust in the information sources such as e-mail or phone call with friends and conversation of strangers are, the more they tend to withdraw their deposits. On the other hand, the estimated parameters of the frequency of accessing the information sources such as TV news program, the Internet and 2-channel is significant at 10% level. The more frequent individuals access TV news program and the Internet excluding 2-channel, the less they tend to withdraw his deposit. But, the more frequent they access 2-channel, the more they tend to withdraw their deposits. This implies that effects of degree of trust in some information sources are not uniformly against individual's deposit-withdrawal behavior and that the effects differed by a kind of the information source.

It is found that understanding the Japanese deposit insurance scheme is useful and effective to avoid the bank run (Similar to Takemura, Kozu and Kobayashi (2011), we run stepwise logistic analysis at each probability of failure of bank. As the result, we confirm that understanding the Japanese deposit insurance scheme is useful and effective to avoid the bank run). Though, as mentioned above, ratio of individuals

who do not correctly understand the Japanese deposit insurance scheme is around 48% at the present. Since this ratio is not high, still now, we should reduce the ratio.

From the sign of effects from mass media, b_E_mass, we find effects from mass media contribute to the deposit-withdrawal behavior irrespective of kinds of media. This conjures images that the mass media have clout after all.

The sign of estimated parameters of the degrees of risk aversion, the degree of trust in the government and expected economic growth rate are positive. On the contrary, the sign of estimated parameters of annual income and degree of anxiety on financial situation of family are negative. This is, the more risk-averse individuals are, the less individuals tend to withdraw his deposit. In the same manner, the more individuals trust in the government or the higher they expect the future economic growth rate, the less individuals tend to withdraw his deposit. We find that economic situation and trust in the system impact to the deposit-withdrawal behavior. Conversely, the higher they feel anxiety on financial situation of family or the higher their annual incomes are, the more they tend to withdraw their deposits.

Furthermore, the amount of deposit and/or the number of account that often used as economic factors are removed in the process of stepwise ordered logit analysis. Therefore, these variables do not impact to the deposit-withdrawal behavior. In other words, bank run could occur irrespective of having multiple accounts as the purpose for diversification of risk and the scope of the Japanese deposit insurance scheme.

Finally, as the variables on the effects from friends, the sign of estimated parameter of the rate of friends or colleagues withdrawing their deposits is positive. That is, the higher the rate is, the less they tend to withdraw their deposits. However, the sign of estimated parameter is different from our assumption (we assume the parameter is positive). So, the result somewhat sounds odd. In near future, we will conduct additional analysis the details of this result.

SIMULATION

We can easily calculate the probability of individual withdrawing the deposit by using estimated parameters in Table 3 and micro data in the survey. For example, we show an example of the calculation in Table 4 (When we calculate the probability, we use mean of each variable about the other explanatory variables. See Table 5). In this table, we show the probability of when individuals understand the Japanese deposit insurance scheme and the probability of when individuals do not understand the Japanese deposit insurance scheme. From Table 4, by understanding the scheme, ratio of individuals withdrawing their deposits at the low-level of the probability enable to decrease about 0.075 point.

Similar to this study, the financial institute can calculate the probability of individual withdrawing the deposit by using estimated parameters in Table 3. Though, it may be difficult to collect micro data on all explanatory variables by themselves via their original survey. Except, they grasp explanatory variables such as sex, age and annual as customer information. So, they can calculate the probability based on the information that they grasp and estimated parameters in Table 3. Table 5 is a list of the mean of explanatory variables.

Similar to Yada et al (2008, 2009), we can estimate the total amount of deposits prepared in a branch. This provides the important information regarding with risk management. The total amount of deposits prepared in a branch is calculated by the following equation.

$$D^j = \sum_{i=1}^{n} \left(\sum_{l=1}^{j} p_i^l \right) d_j \qquad (*)$$

TABLE 4
UNDERSTANDING THE SCHEME AND RATIO OF WITHDRAWING THE DEPOSIT

	Understanding the scheme	Not understanding the scheme
1: withdrawing at low-level of the probability	0.2413	0.1659
2: withdrawing at middle-level of the probability	0.5154	0.4945
3: withdrawing at high-level of the probability	0.2433	0.3396

TABLE 5
MEAN OF EXPLANATORY VARIABLES

	Sex	Age	It_3	It_7	It_8	It_11
Mean	0.49280576	48.944604	2.7208633	3.0823741	3.2115108	2.3410072
	Ia_1	Ia_4	Ia_5	Ujps	E_mass	Ra_1
Mean	4.2834532	3.5920863	1.502518	0.51870504	3.6751799	0.00001395
	Gt	Exp_eg	Income	Unsat_7	Friend_2	
Mean	3.2125899	-0.3123777	3.8363309	3.8568345	0.33791976	

TABLE 6
UNDERSTANDING THE SCHEME AND RATIO OF WITHDRAWING THE DEPOSIT

Condition		Ratio
Male: 25 y/o and annual income is 4.5 million yen	1: withdrawing at low-level of the probability 2: withdrawing at middle-level of the probability 3: withdrawing at high-level of the probability	0.1925 0.5073 0.3002
Male: 55 y/o and annual income is 6 million yen	1: withdrawing at low-level of the probability 2: withdrawing at middle-level of the probability 3: withdrawing at high-level of the probability	0.2423 0.5154 0.2423
Female: 28 y/o and annual income is 5 million yen	1: withdrawing at low-level of the probability 2: withdrawing at middle-level of the probability 3: withdrawing at high-level of the probability	0.1789 0.5017 0.3194
Female: 32 y/o and annual income is 0.8 million yen	1: withdrawing at low-level of the probability 2: withdrawing at middle-level of the probability 3: withdrawing at high-level of the probability	0.1530 0.4855 0.3615

where D^j is the total amount of deposits prepared in a branch at probability j, p_i^j is the probability of withdrawing the deposit, d_i is amount of individual's deposit. Besides, a branch has n depositors. Note that p_i^j is calculated by using Table 3 and Table 5.

Here, we show four examples of ratio of withdrawing the deposit in Table 6. In this manner, according to equation (*), the financial institute can calculate the total amount of deposits prepared in a branch by using explanatory variables such as sex, age and annual and the mean of the others in Table 5.

POLICY IMPLICATION AND THE FUTURE WORKS

In this study, we model individual's withdrawal behavior with risk tolerance. By analyzing our model, it is found the followings: 1) effects of psychological factors such as degree of trust in information sources and degree of risk aversion are not uniformly against individual's deposit-withdrawal behavior. 2) the probability that they carelessly withdraw their deposits tends to be lower if individuals correctly understand Japanese deposit insurance scheme. 3) annual income affects individual's deposit-withdrawal behavior, but total amount of his/her deposit and the number of accounting do not affect it. Especially,

finding 2) may have important implication to the authorities concerned. By understanding the scheme, ratio of individuals withdrawing their deposits at the low-level of the probability enable to decrease about 0.075 point. Therefore, we propose that the government and/or financial institutes implement the measure which promotes to let understand Japanese deposit insurance scheme to depositors. Such measure would determine sustain of confidence and establishment as one of the purposes of the Japanese deposit insurance scheme.

Finally, let us briefly explain future works. Because "the survey on depositors' behavior in Japan" that we use in this study includes geographical information, we may analyze the panic process by the similar method to Kelly and Ó Grada (2000). In addition we would like to improve the model hereafter.

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MNC Expansion and Target Environment Hostility

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We offer an alternative account of MNC expansion and the environment hostility the MNC faces in target environment. While it is an attempt to embody the absence manifested in traditional MNC literature, it is not a marginalized relativist account. We used different examples supported by theory to reveal a 'version' of what MNC is, what it can face as well as what target environment is and how it experiences the MNC and its expansion. The account is an endeavor to go beyond reification of the MNC and the contexts in which it exists with an aim to explore the endeavors of the MNC to exist across different contexts. We question the variance of what exists, is allowed to exist, across space and time.

INTRODUCTION

Traditionally M&A deals have been considered as phenomena on their own sake; regardless of space and time they are experienced. The different experiences leading to different interpretations and practices were hardly of concern. In this paper, we challenge such a conceptualization. The reality of the phenomenon becomes a temporal and spatial reality. Experience and related practices and symbols reflect and refract the institutional configuration of specific time and space. Unless the context and time is the same, even the same phenomenon induces different experience. Even difference in time creates variation within the same space, as the practices and symbols change their underlying the institutions along the time. For example, two deals with MNCs with same country of origin and target country can receive different reaction when carried out in different time intervals. One of them can be welcomed and go unseen, while the other can generate a hostile reaction. The experience of M&A phenomenon changes from one time to another, creating only temporal reactions to temporal realities.

Dubai Ports (DP World) acquired the London-based Peninsular & Oriental Steam Navigation Co. (P&O) in 2006 for $6.8 billion, to become the world's third-biggest container-port operator. This acquisition received attention not only in Europe, but in the U.S. as well. The transaction marked the end of the 169 years of independence for P&O that is known for transporting cargo across the former British Empire (Agence France Presse, 2006). Despite the United Arab Emirate (UAE)'s good relations with the U.S. government (US Fed News, 2006), the deal caused political uproar in the U.S. Consequently, DP World agreed to sell terminals in New York, Newark, Baltimore, Philadelphia, Tampa and New Orleans (Bloomberg News, 2007).

On the other hand, in 2007 Saudi Basic Industries Corporation (SABIC)'s purchase of GE Plastics went unnoticed. SABIC, one of the world's 10 largest petrochemicals manufacturers, acquired GE Plastic for a purchase price of $ 11.6 billion—further concentrating the market for petrochemicals. Despite of traditional anti-monopoly sentiment in the US, the deal received hardly any news coverage let alone state or public reaction.

The international expansion strategies of MNC's, defining their foreign investments—subsequently the M&A's—reveal understandings, practices and symbols that relate to experience of organizations in country of origin (i.e. generally where the headquarters are located). The meanings that the practices and symbols take within certain context display institutional configuration of the both MNC country of origin and target country. The choice of entry mode, management and structure of subsidiaries and patterns of within and across organizations communication in MNC network exhibit country of origin institutional configuration. On the other hand, the reaction to MNC reveals the degree to which the practices and symbols introduced by the MNC can be internalized or at the most accommodated within the target institutional configuration. Contradiction between two different institutional configurations of different spaces, which were transformed by different temporal sequences, lead to a negative experience in the target environment. Such a negative experience, in turn, gives rise to hostility at different levels of target country. The degree of hostility, unwelcomed negative experience due to a 'perceived' intruder, is defined by depth and strength of the contradiction manifested.

Overall, all acquisitions are not equal; they exist and are evaluated within different realities of space and time. Some mergers and acquisition deals become critical while others are ignored. We develop a conceptual framework built on institutional theory and explore two questions: 1) Why are some environments hostile, and 2) Why do some acquisitions face a hostile environment while others do not? While we focus on the variance in target environment hostility, the MNC country of origin, and the target country industry characteristics, we aim to understand the dynamics of institutions and organizational identity. Below, to explain hostility arising in the target country, we review three separate literatures, beginning with the organizational literature focusing on the MNC. Then, we show that by including Friedland & Alford (1991)'s conceptualization of institutions, we can add a more thorough understanding of reactions MNCs face upon their entry to target market. Finally, we review the literature on organizational identity and image to show how negative evaluations and experiences related to "foreignness" are formed. These evaluations essentially reflect the heightened contradiction among the target country institutions due to entry of the MNC parent. The contradictions are experienced both in material everyday practices and symbolic meanings. Yet, they are most visible in practices manifested by the actors.

THEORY IN MNC CONTEXT: LIABILITY OF FOREIGNNESS, INSTITUTIONAL LOGICS AND ORGANIZATIONAL IDENTITY AND IMAGE

Traditionally MNC in organizational literature is conceptualized as disembedded from the society, relatively free from political and social pressures of their home base (Lane, 2007). Recently, this perspective advanced its hold on organizational theory by conceptualization of ''metainstitutional level (Djelic & Quack, 2003: 11)'. In their recent overview of institutional theory in MNC context, Kostova et al (2008) supports existence of a 'metainstitutional level (Djelic & Quack, 2003: 11)' which is becoming more detached from national level (aka meso level) institutions. Looking at institutional theory differently in MNC context only diverts our focus from main phenomenon of interest, which is the influence of variance in institutional configurations across borders. The variance in not only institutional configuration, but also their effects on the MNC depending on space and time is the matter of interest. MNC is a separate organizational form, more complex and prone to high level of conflict (Kostova et al., 2008). However, MNC is still not a separate reality from the institutional configurations it emerges from. Hence, the inherent complexity and conflict reflect the contradiction among different institutional configurations they attempt/ fail to exist in.

In organizational theory focusing on MNC context, the impediments MNCs face in the target environments they enter are mainly examined under the liability of foreignness research stream (Zaheer, 1995; Zaheer & Mosakowski, 1997; Kostova & Zaheer, 1999). In the following section, we will review research in this stream. This review will be followed by an examination of "institutional logics" research, which forms the foundation of our conceptualization. And, finally we will go over organizational identity and image literature highlighting its lack of concern for multiple institutional environments.

MNC and Liability of Foreignness

The liability of foreignness literature, with its limited conceptualization (Zaheer, 1995; Zaheer & Mosakowski, 1997; Kostova & Zaheer, 1999), and empirical works, overall, seems to have used the taken-for-granted institutional theory concepts. These concepts are mainly built on a structuralist macro perspective on institutions (DiMaggio & Powell, 1983, 1991; Meyer & Rowan, 1977), which assumes a duality of material practices and symbolic system. Such a divide inhibits integration of material practices and meaningfulness of these practices. Therefore; little attention is paid to the dynamism and temporal nature of meanings underlying material presentations such as environment hostility, and costs incurred due to being foreign.

An in-depth analysis of the MNC context using institutional theory was presented by Kostova and Zaheer (1999). Their examination lays out the main framework of the MNC legitimacy. The scholars identified main sources of liability of foreignness as the process of legitimization and its complexity, imperfection, and bounded rationality. With an emphasis on taken-for-grantedness of the assumptions and stereotypes, the focus is on cognitive aspects of the liability of foreignness.

Empirical work following the liability of foreignness conceptualizations does not seem to extend the theory. Within boundaries of the conceptual framework defined, these studies offer limited institutional explanation. For example, Miller and Parkhe (2002) define the determinants of liability of foreignness as "nationalistic and discriminating behavior on the part of host country consumers, firms and institutions" (p.57) and "embeddedness" (p.57) of local firms in the host environment. Similarly, Elango et al. (2009) emphasize foreign firms' lack of familiarity with the environment, host environment customer and regulator lack of knowledge on the foreign firms as the elements leading to liability of foreignness. Generally in LOF studies, unfamiliarity between the target environment actors and the MNC as a source is emphasized. Similar solutions, involving isomorphism of the MNC to the target country companies, are offered.

The main problem with both theoretical and empirical studies involving LOF seems to be conceptualization of institutions as rigid, fixed realities consisting of separable domains of rules, norms and cognitions, which can be examined isolated from macro level institutional contestation. Such a perspective conceals dynamism and fluidity inherent in institutional configurations. In current LOF framework, cognitive and normative domains are harder to overcome compared to a regulatory domain (Kostova & Zaheer, 1999:70). Instead of separating domains, the approach should be more integrating, bringing together "individual agency and cognition and socially constructed institutional practices and rule structures" (Thornton & Ocasio, 2008:101).

In their overview, Kostova, Roth and Dacin (2008) argue that the application of institutional theory in MNC context has been confined to a "narrow set of neoinstitutional ideas" (p.994). We further argue that this stems mainly from the fact that a) separate domains within institutional order are conceptualized, b) these domains are assumed; they are not explicitly analyzed, and c) temporal and spacial reality of socially constructed concepts are ignored. Within a restrained framework, the previous studies on liability of foreignness regard the institutional environment consisting of three separate domains, which grants legitimacy. And, this legitimacy can be attained through isomorphism (Kostova, Roth and Dacin, 2008:995). Our conceptualization of MNC in target environment is not restricted to 'cognitive domain' as an end in itself. It is rather based on institutions that shape that cognition in a specific time and space. The legitimacy, along with its necessity, and liability of foreignness are temporal and spacial based on dominant institutional configurations of certain trajectory. The dynamism of the configurations are enabled through change in institutional logics, which can be succinctly defined as "a set of material practices and symbolic constructions – which constitutes [institution's] organizing principles and which is available to organizations and individuals to elaborate (Friedland & Alford, 1991:248)" Such a perspective answers the call of Kostova, Roth and Dacin (2008) in theorization of social environment as a social construction which is both material and symbolic, not 'either / or', and call of Thornton & Ocasio (2008) in applying institutional logics to the MNC context.

Institutional Logics and the MNC

Institutional logics literature is a part of new institutional theory stemming from the seminal work of Friedland & Alford (1991). Contrary to deterministic approaches of institutional theory emphasizing isomorphism (Meyer & Rowan, 1977; Zucker, 1977; DiMaggio and Powell, 1983, 1991), Friendland and Alford (1991)'s view focus on influence of diverse and contradictory institutions on individuals and organizations. The logics of institutions provide a link between institutions and action, thereby forming a bridge between structural perspectives of Meyer and Rowan (1977) and DiMaggio and Powell (1983) and Zucker's micro level process oriented approach (Thornton & Ocasio, 2008).While Friedland and Alford (1991) conceptualized institutions and institutional logics at the societal level, the following works adopted industry level perspectives. Such a perspective focused on reflections and refractions associated with specific institutional configurations rather than institutions themselves. Below we will briefly review contributions of institutional logics literature to the organizational theory, and continue with our contribution to the literature.

The institutional logics literature offers a wide range of explanations on organizations—such as attention in organizational decisions (Thornton & Ocasio, 1999), organizational strategy and structure (Thorton, 2002), status claims (Lounsbury, 2002), R&D networks and organizational learning (Lam, 2003), use of rhetoric and legitimization (Suddaby & Greenwood, 2005), change in organizational governance (Thornton, Jones, & Kury, 2005), market entry timing (Lee & Paruchuri, 2008), change in business group strategy (Chung & Luo, 2008), origins of corporate networks (Bhappu, 2000), and collaborative relationships (Reay & Hinings, 2009). All studies, except for Chung & Luo (2008) and Lam (2003), examined organizations in their local environments. Putting an emphasis on industry level reflections of institutions, these studies focused on the change in values, assumptions, perceptions and practices (Thorton, 2002; Lounsbury, 2002; Suddaby & Greenwood, 2005; Thornton et al.,2005; Reay & Hinings, 2009).

In contrast, there is little conceptualization on contradiction among not only within but also between institutional configurations dominant in different contexts. The most suitable context to examine such contestations is multinational corporations (MNC's). Two studies that use institutional logics in MNC context are Chung & Luo (2008) and Lam (2003). Both studies used institutional logics at industry level to explain variation in MNC subsidiaries and organizations, overall, in environments where reflections of divergent institutional configurations are forced into association. Chung & Luo (2008) argue that coexistence of competing institutional logics—introduced by foreign MNCs entering Taiwan (i.e. German, Japanese and U.S.) —provides the domestic organizations an opportunity to change. According to the study, the stakeholder/ shareholder models of foreign firms seem to influence the family based corporate structure in Taiwan. Lam's (2003) research reveals that the American MNCs are better at adapting to their environment compared to the Japanese MNCs, thanks to their decentralized and flexible corporate structure stemming from the 'liberal market institutions' of the U.S.

Both Lam's logics of the 'professional community' and the 'organizational community' (2003:697), and Chung & Luo's 'institutional logics of corporate governance (2008:767)' are mechanisms of reproduction; they involve social relationships through which individual behavior is attained. They reflect and refract institutions; but they are not institutions. Hence, they can be labeled as rituals, having different meanings depending on the context. Such conceptualization restricts the institutional logics literature's ability to explain environment hostility which can be explained at both societal and industry level using institutional logics. Societal level institutional logics "constitute the cosmology within which means are meaningful, where means-ends couplets are thought appropriate and become the naturalized, unthought conditions of social action, performing the substances at stake within them (Friedland, 2002: 383)". On the other hand, industry level reflection and refractions, which are labeled as industry level institutional logics (i.e. Thorton & Ocasio, 2008; Thornton, 2004, 2002, 1999), are *mechanisms* of reproduction.

Duality between industry and societal level institutions decouples one level from the other. This can be considered as a serious problem because duality between levels leads to an isolated industry level analysis, which hampers the efforts in understanding the meanings that drive the actions and actions that drive the meanings. Such an analysis also limits our understanding of actor's interests and identity, as

existence of certain identities and interests are tied to societal level institutions and social relations that make them real (Friedland, 2002).

To our knowledge, there are no studies on environment hostility integrating societal level institutions and their industry level reflection and refractions. We do not refer to resistance limited to a domestic industry or organization in a specific national environment at a specific time and space; but to the resistance when different institutional configurations of different national environments come across in different contexts. Examined in light of specific time and space, the resistance becomes a temporal and spatial reality. Due to fragility of institutional configurations, the resistance at different levels is not fixed. Using institutions and their logics mainly at the societal level (Friedland & Alford, 1991), we argue that institutions define identity, interest, power, and action of the individuals, groups and organizations in an institutional environment, making them distinct from any other. The environment hostility arises from contestation between different institutional configurations, while variation in local hostility arises from temporal nature of configurations.

Within our theorization of environment hostility, the concepts of institutional logics, and identity are tightly linked. Institutions provide individuals, groups and organizations with a sense of self (identity) as they define institutions' organizing principles and are accessible to organizations and individuals (Friedland & Alford, 1991:248). The interests, values and assumptions of individuals and organizations are ingrained in prevailing institutions (Friedland & Alford, 1991). Therefore, the means and ends of actors' interests are facilitated and restrained by dominant institutional configurations. The actors reproduce and defend the institutional logics stemming from dominant configurations because the institutional logics, unless transformed, maintain the configurations that foster the perceived common status, power balance and interests. This kind of identification generates cooperative behavior which seeks to protect the interests of the collective against the competing identities (Thornton & Ocasio, 2008: 111). Based on this definition of institutional logics, environment hostility can be defined as a political opposition stemming from differences in interests, values, assumptions and practices at specific time and space.

Thanks to institutional configurations, which constantly reveal a shift of institutional systems, not only environment hostility, but also environment hospitality has a temporal nature. Thus environments deemed as hostile / hospitable today may not be so in the future depending on their historical progression. Therefore, we would like to emphasize that the five main institutions and dominant institutional configurations of the West can change, thanks to their dynamic logics, in time. The configurations are not fixed, neither anything they define. None of the examples given may apply in the future; the enemies of today can be business partners tomorrow. However, the institutional contestation is the only permanent fact in this conceptualization full of temporary realities.

Organizational Image and Identity

The existing literature on organizational identity and image offers a rich body of research that provides various conceptualizations (see Gioia et al., 2000, for a summary), and empirical studies (Dutton & Dukerich, 1991;Gioia &Thomas, 1996; Elsbach, Sutton & Principe, 1998; Hoffman & Ocasio, 1999; Elsbach & Bhattacharya, 2001; Corley & Gioia, 2004;Bansal & Clelland, 2004; Deephouse & Carter, 2005; Haines, 2006). However, the organizational identity and image literature seems to be organization centric, discounting the influence of institutions on the meanings attached to identities and images (Glynn, 2008).

Additionally the literature mostly remained within domestic boundaries, dealing with the local organizations reflecting institutional configurations of that time and place. Both theoretical and empirical research are confined to the U.S. –i.e. organizational image and identification (Dutton & Dukerich, 1991), impression management tactics (Elsbach, Sutton & Principe, 1998), impression management and shareholder value (Bansal & Clelland, 2004) industry level attention and identity (Hoffman & Ocasio, 1999), organizational disidentification (Elsbach & Bhattacharya, 2001), organizational identity change (Corley & Gioia, 2004), organizational legitimacy and organizational reputation (Deephouse & Carter, 2005), social movement organizations and management of controversial identity (Haines, 2006).

Within context of MNC, this U.S. centric conceptualization of identity and image that lacks a consideration of variety in institutional environment, which leads to differences in perceptions and understanding, is inadequate to explain target environment hostility. The meaning associated with an organization outside its home environment is defined by the dominant institutional configuration of the environment entered. The pattern of practices, symbols and understandings are different in this new environment, the industries within which the organizations are embedded are distinct; hence the organizations and the way they do things are different. An appropriate definition of identity requires consideration of temporal and spacial dynamics that explains the perceptions and evaluations leading to hostility.

In theorization of environment hostility, we argue that different institutional configurations in diverse settings influence the identity formation in ways that are not necessarily compatible. Therefore, with its organizational structure and strategies—including mergers and acquisition activities—the MNC reflects the institutional configuration of its home country. Its aggressiveness, communication and cooperation patterns, future planning, expansion patterns, perception of loyalty and trust all become evident in MNC's dealings with organizations from different institutional environments. The reaction to the MNC's expansion is also a reaction to practices and symbols associated with its institutional configuration. For example, the reaction Wal-Mart's expansion to Germany, due to its aggressiveness, lack of respect for suppliers and labor unions, is not only a reaction to Wal-Mart. The practices that are normal and appropriate for the U.S. business environment are encouraged to keep the market flexible and competitive (Sorge, 2007), which is not the case for Germany.

ENVIRONMENT HOSTILITY

We examine target environment hostility in two levels: macro (societal) and industry level. Although the main reason is the same in both cases, namely contestation within and among institutions, the difference in domain of conflict (within or between/among) and its reflections necessitate different levels of analysis. Below is a simplified table on our following conceptualization of environment hostility.

TABLE 1
ENVIRONMENT HOSTILITY AT DIFFERENT LEVELS

Between	Within	Hostility
Capitalism	State	Macro level
Democracy		
State	Capitalism	Macro level
Family	Capitalism	Industry Level
Democracy		

Macro Level Hostility

Macro level environment hostility refers to the cases in which three historically dominant institutions of the West, institutions of bureaucratic state, democracy and capitalism (Friedland & Alford, 1991), contradict not only each other but also may reveal internal conflict. When we refer to within state contradiction, it refers to opposition within the government on what state can and should do. Within institution contestation allows for different interests with different objectives to arise and struggle for power by using various strategies, including rhetoric. Rhetoric used is defined by the contestation and interests advanced or defended. Hence, the actors that can mobilize the power that public have (election of government and representatives, strikes, protests) will have more leverage in the contestation. The accommodation of different institutional practices and symbols while advancing or defending principles

of an institution will enable the actors to combine power derived from different institutions and change or defend the meanings and practices.

Within institution of capitalism contradiction refers to conflict on what can be commodified and traded freely. The within institution contradictions arise primarily due to their conflict with other institutions. For example, institution of state may contradict with institution of capitalism creating conflict on whether water should be bottled and sold for money by private parties or distributed to public by the state. The power and interest of actors in both institutions are defined by the context, they are historically dependent (Friedland & Alford, 1991). If the institution of the state historically incorporates practices and symbols related to control and allocation of natural resources, the actors maintaining and defending the institution mobilize public—accommodate institution of democracy—to limit expansion of institution of capitalism to its domain of control. However, if there is a divide within the institution of state over whether water should be commodified, then the contestation between institution of capitalism and state can become fiercer. Such a contestation would divide the actors defending institution of state, and allow for different interests pursue different collaborations and use different rhetoric.

The case of DP World acquisition is an example of contestation among institution of state, capitalism and democracy. The institution of state, maintained and defended by government at that time, contradicted with institution of democracy. Although institution of state accommodated institution of capitalism, allowing sales of ports as commodity and source of rent, it conflicted with institution of democracy. The elected representatives, whose power and interests are defined by institution of democracy, mobilized the public through use of social movement organizations. The decision of the government or non-interference of the government was converted into a public issue that has to get consent from public. To make the matter a public issue, a problem arousing public emotions and attention was needed. Democrats (the opposition party) used port security and terrorism, transforming the issue one from ordinary business deal complying with logics of capitalism and state to one that threatens institution of democracy. The issue was depicted by democrats in such a way that it required majority consent. And, the majority formed its opinion on the issue based on the stories crafted by the democrats who opposed the state authority.

Such a resistance to state authority and its centrality is defined by US institutional system that is defined by specific episodes of space and time. In the US any practice or symbol representing centralized state structure, a central bank, unified power of government and non-regulated markets would contradict with institution of democracy. This is related to the American tendency for decentralized state structure, separated governmental powers and market regulation aimed at restricting market concentration is embedded in founders' experience of regulative and intrusive English state (Friedland & Alford, 1991). The context specificity of the environment hostility can be observed by lack of reaction to the SABIC acquisition of GE plastics. The SABIC deal went all unnoticed as if it never happened, despite of the fact that it was a giant American company, GE plastics, being acquired by SABIC. The acquisition decreased number of big players in raw plastic industry from four to three, leading to further concentration in the market. Yet, there was no reaction, despite the fact that restriction of market concentration is one of the practices embedded in American history. This phenomenon can be explained by lack of stark contestation between the institution of state and democracy, although institution of capitalism does not seem to be accommodating institution of state. A concentrated market indicates increased dominance of principles related to institution of capitalism at the expense of state and public control over allocation of resources and human activities. In spite of the contradiction implied by the deal, there was no open contestation. The lack of already existing tension in the US saved SABIC from state and public attention. There was no apparent contestation of power among parties of different interests. This, in turn, avoided various conflicting rhetoric strategies leading to mobilization of public.

DP World Deal as Scandal

Looking at two different cases of M&A involving MNCs with similar country of origin, it is crucial to realize importance of publicity accompanying the contradiction among institutions emphasized by the

DP World deal. Deals emphasizing contradiction among different institutions, such as the case in SABIC deal, go unnoticed. What was it that made DP World deal so special and disruptive?

Ritual behaviors are the media through which values are manifested, rules for reaching ends and the conceptualization of ends are constructed. These behaviors maintain and reproduce the institutions by defining one's self through a conditional existence based on patterns of practices and system of symbols. One is denied of existence, if he/she fails to understand and act in institutionally defined ways. As the actors within a certain institutional configuration maintain, reproduce and defend their world through rituals that define their positioning, access to material benefits, and social relationships connecting them to the institutional order, it is only natural that any practice, or symbol that transgresses the rituals is considered to be a wrong doing 'transgression' which entitles the person performing the transgression as deviant.

Not every transgression receives open hostility or sanctioning from the actors. It may be overlooked due to parties involved, especially if it involves authorities from state or the elite (Adut, 2005). A contamination of state representatives or the elite implies significant damage to not only their credibility and reliability as representatives, but also institutional configuration that they reproduce. Questioning of authorities reproducing a certain institutional configuration triggers questioning of symbols, meanings and practices that they derive their power and interests from. Extension of questioning to differences in understandings and practices leads to institutional change, which shifts the power from existing authorities to dissidents supporting an alternative institutional configuration. Therefore, even if a transgression exists, it will be tolerated as long as it remains unknown to public. However, once it is communicated to the public, publicity generated changes the meaning and influence of transgression on the institutional configuration (Adut, 2005).

Involvement of state officials and elites combined with importance of the deviant within certain social circles only makes the reaction to transgression more intense. The fury of public gets more substantial and destructive as a result of continuous communication among press, an authoritative figure communicating the transgression, and intended audience within the public. The intended audience refers to the fact that not everyone within the public reacts to the communicated message, the authority communicating the message must address it to the group (s) that is sensitive the message. It is important that the actors receiving the message identify with the message and unite with a feeling of dissent and request for action (Adut, 2005). Yet, it is usually the strategic communication more than the consensus that defines how the public transgression is resolved (p.235). Following Adut (2005), we will name this "disruptive publicity of transgression (219)" a *scandal*. To resolve this fury and avoid further contamination, the officials reveal extra effort and enthusiasm in closing the case (Adut, 2005). This generally signals harsh measures or beyond necessary caution by the officials to avoid outbreak of questioning of practices and understandings.

DP World deal was turned into a scandal. Although the government, representing the institution of state, first approved of the deal, they had to take back their support and approve of DP World's sale of their stake in the ports. The deal going public through news coverage and heated public debate, through communications initiated by the opposition (democrats), marked start of macro environment hostility for the DP World. The communication among popular press, representatives in opposition, and social activists did nothing but increase the fury against the DP World. This fury against DP World also contaminated the government's image due to its approval of the deal. The rhetoric of the opposition focused on terrorism and national security, which were successfully addressed by DP World. The official statements from state agencies, news wires and statements of the prior business partners of the multinational all attest the fact that the MNC carried out operations across Europe, had business dealings with Israel, and on top of all it had no intentions to interfere with the port operations. However, the audience, to which opposition communicated its message, still had the fear of a terrorist attack with an emerging cynicism for business and government relations and business world itself. Therefore, it did not take long for the wave of hostility arouse across the country, blaming both the government and business for supporting such a deal 'that threatened the national security of the US'. The accusation implied treason, selling the assets that are 'vital for national security' to the 'enemy'. Additionally, whoever

supported the deal was deemed to be 'anti-American'. Supporting a deal that was as legitimate as any other deal of an MNC in the US suddenly became synonymous to being anti-American. Association with anti-American image coupled with upcoming elections made it only worse for the government. They had to act hastily and resolve the matter once and for all. The residing government ended up yielding to the opposition leaving the DP World no choice but to give up its stake.

Macro and industry level hostility varies not only across M&A cases, i.e. DP World vs. SABIC, but also across contexts. Resistance to state authority, such as in the US, is less likely in the Continental Europe institutional system. The Central European system promotes and favors concentrated institutional powers in pursuit of objectives (Friedland & Alford, 1991). Hence practices and symbols associated with centralized state (i.e. Germany), a central bank (i.e. Deutsche Bundesbank and attempts to empower ECB), and market concentration (i.e. Volkswagen[1] and Porsche merger) are welcomed in Continental Europe. This explains the lack of hostility against DP World in its previous European port acquisitions and acquisition of P&O (a British company with heritage) in the UK.

> *Proposition 1: Societal level hostility (macro) against the MNC (the acquirer) depends on the extent to which contradiction among the institutions is emphasized by the acquisition.*

Industry Level Hostility

Industry level hostility arises primarily due to contradictions within institution of capitalism and its contradiction with other institutions, especially institutions of democracy and family. The main principles of institution of capitalism reveal practices and symbols that are related to accumulation and commodification of human activity (Friedland & Alford, 1991). These practices and symbols naturally conflict with institutions that uphold the practices and symbols associated with freedom, equality and loyalty in collectivities formed, namely institutions of democracy and family. Institution of capitalism promotes transformation of every human activity into economic activities allowing for management of activities within a market system (Friedland & Alford, 1991). Such an institutional system encourages individuality, competition and inequality by principle. Therefore, every activity, symbol or meaning that opposes such logic also contradicts the institution itself that defines the related interest and power.

The conflicts among these institutions are not always apparent though. These institutions are interdependent (Friedland & Alford, 1991); the interplay of power among them defines the power of business elites and populist demands over the political scene. The contestation among them is generally contained when the institutions accommodate extension of a certain institution in their realm. However, such an accommodation might not be possible in every context, in different definitions of space and time. For instance, banks of 18th and 19th century UK were governed patrimonially mainly by founding owners, while such a structure was not feasible for 20th century and onwards (Stovel & Savage, 2006).

The extent to which institution of capitalism accommodates other institutions is also space and time specific, different contexts with varying history reveal different practices, symbols and meanings associated with capitalism. This can be observed by the difference in production regimes of advanced economies of the West. The pattern of production regimes in West can be examined in two: Business-Coordinated Market Economies (CME) and Liberal Market Economies (LME). While CME is a pattern observed in Northern European economies (i.e. Germany, Sweden, Switzerland), LME is observed in Anglo-Saxon economies (i.e. the UK and US) and Ireland (Soskice, 2007).

These production regimes are reproduced through various rituals that define the "membership rules" (Lawrence, 1999) of the industries. The membership rules are redefined as the rituals reflecting the societal institutions change along with the institutional environment. These rules are not only material practices, but they are also charged with what it means to be a member and who can be called a member. They refer to a symbolic world that is enacted through membership, which will cease to exist once the membership loses its meaning. The membership rules define what it means to be a member, the identity of the member, the status of different members, the perception of members of other members and non-member organizations. Interaction, domination structures and information sharing is established through

membership rules in the industry (Lawrence, 1999). Looking at industries embedded in CMEs and LMEs, one can observe the clear demarcation in interaction, domination structures and information sharing.

CME is an example of how institution of capitalism accommodates institutions of family (loyalty, acting in collective), democracy (role of labor unions), and state (framework for the market system) in Northern Europe. In CME business coordination takes place at the industry level. Such a system promotes industry-defined unions, within-industry technology transfer and diffusion, technical norm-setting and specialists training (Soskice, 2007). Key actors are business associations and industry unions. The state ensures the maintenance of the system by sustaining a framework that encourages cooperation, collective action, and communication. In CME, industries tend to be more cohesive, in which communication, collaboration and loyalty is high. Most of the research and production takes place in home country rather than in host countries as the skills and communications required are mainly developed in the home country, hence considered as advanced for the other markets. Promotion of long-term cooperative institutional framework for companies is in the interest of North European business (Soskice, 2007). Such a framework "maintains their high status, their security and their networks, and uses their expertise, which is often a combination of high technical competence and the ability to develop consensus solutions (Soskice, 2007: 179)".

On the other hand, LME is an example of the way institution of capitalism accommodates the other institutions in Anglo-Saxon countries and Ireland. The state cannot deal with business in collectives, as industries consist of loose relations (Soskice, 2007). The institution of capitalism limits extension of institution of family and of democracy to maintain deregulated markets with strong competition requirements. For instance, contrary to CMEs loyalty to a collective, strong labor unions negotiating for workers are absent in LMEs. The power of collective action and communication is absent in the US and UK business context. Therefore, promotion of deregulated institutional framework for companies is in the interest of companies in the UK and US. Such a framework allows for a strong competition environment for companies with short term horizons, which gives them little incentive to cooperate (Soskice, 2007). Hence, they can hardly react as a collective and negotiate with the state as one.

Wal-Mart's initial failure in Germany is a good example of the way an MNC with LME country of origin can conflict with the target industry in a CME, leading to both open hostility as well as subtle reactions. Wal-Mart's acquisition of active businesses in the retail industry was the right one as the German market was overcrowded with well-established players. However, Wal-Mart's ignorance of the competitive structure involving key competitors, suppliers, labor unions and customers brought its demise (Senge, 2004). If it were in a LME, its strategies would have fared well, as they would have not revealed any contradiction to the existing practices and understandings of doing business in the retail industry.

The aggressive corporate and business strategies of Wal-Mart required expansion of institution of capitalism in expense of institutions of family and democracy, which implied an institutional change starting from industry wide practices and understandings. Therefore, expansion of the US MNC in the German market became a threat to the system from which key German retailers, suppliers, workers and consumers derived their power and interests.

> *Proposition 2a: To the extent to which the acquirer identity conflicts with the industry membership rules defines the strength of the rejection revealed in the host environment.*

Production regimes, which reveal the extent to which institution of capitalism accommodates other institutions, define characteristics of the individual organizations as well as the characteristics of the industries. While characteristics of the industries define the membership rules, the characteristics of the individual organizations define their identity.

Identity and Image

The social embeddedness of an organization defines which elements in the environment matter, when they matter, how they come to being and change over time and how they match/conflict with each other (Glynn, 2008:420). An MNC forms its identity through its communications with the various actors that

are embedded in both its home environment and the target environment. Different patterns of communication, symbols and meanings stemming from different institutional configurations naturally influence the content of the exchange. Every institutional configuration reveals different patterns of industrial practices and symbols. The corporate strategy of the MNC, revealing its country of origin, influences how the subsidiary is perceived and admitted as a member of the industry. This is mainly due to the fact that MNC country of origin generally defines the MNCs' mode of entry into the target market and choice of subsidiary management (Lane, 2007).

For example, industries embedded in a CME, where cooperation, loyalty and long term objectives are encouraged, would foster practices and symbols that maintain and extend such a system. Therefore organizations in such an industry would have characteristics that support the existing institutional configuration. On the other hand, industries in a LME, where strong competition, flexibility and short-term focus are fostered, encourage practices and symbols that maintain and extend such a system. Hence, organizations within such industries have characteristics supporting the institutional configuration they are embedded in.

The Wal-Mart expansion to Germany serves as a good example in this case as well. The German companies Wal-Mart acquired carried out their operations with a long term focus that fostered trust, long term relationships, loyalty, and good relations with unions. Their identity naturally reflected the business environment defined by institutional configurations of a CME. Wal-Mart's hasty attempts at changing practices and understandings embedded in the market system were not welcomed by the members of the industry, as they threatened the existing interests and power balances in the industry. Therefore, almost every member of the German retail industry took stance against Wal-Mart. The strongest player of the industry, Metro AG, cornered Wal-Mart through series of acquisitions and financial help to weak companies, the suppliers got out of their engagements, the customers switched to German competitors, and finally labor unions disgruntled (Senge, 2004).

The norms, practices, understandings, meanings and symbols relating to a specific industry is maintained, defended and extended by individual organizations supporting those characteristics and meanings. The power and interests of the organizations stem from the meanings, practices and symbols they are embedded in. It is in the interest of a German organization to defend the system of cooperation, trust, long term relations, in case of any attempt of aggressive acquisition targeting an actor within the system. Any practice or symbol that contradicts with already existing institutional order that supports this system becomes a power issue especially for the key players of the industry. This will naturally deepen the already existing contradictions among institution of capitalism and institutions of democracy, family and state.

Proposition 2b: To the extent to which the acquirer identity conflicts with target identity defines the strength of the rejection revealed in the host environment.

DISCUSSION

An MNC does not simply put forward itself, once an MNC enters a target country. It is continuously molded in its self-statement—consisting of mode of entry, practices, symbols used, public announcements, communications with the different actors. Not only its identity, but also its experience is socially constructed. The MNC experience that emerges in target country is not fixed; it is shifting, relative, spacial and temporal. Not only the MNC changes over time through changes in practices and symbols reflecting and refracting institutional configurations of country of origin, but the target country experience and perception of the MNC changes within its own trajectory. Therefore meaning of and practices related to being 'foreign', 'acceptable', 'appropriate', 'hostile', 'aggressive', and 'similar' both change and get changed by dominant institutional configurations. Requirements for appropriateness can change, or even more interesting they can be tolerated even if they are unacceptable misfits. Deals that get hostile reactions can be accommodated at a later time depending on interests and power balances that reflect different configurations fostering different practices and symbols. Liability associated with being

foreign or strong negative reactions, such as environment hostility, are transient. Therefore, they should be examined as such. Environment hostility is a story of institutions in ever contestation and interdependence, revealing their presence both at macro and micro level, within and across contexts with which they are bonded.

Considering pace of international business and globalization, a better accommodation of practices and symbols across borders is always possible. It is possible not due convergence of institutional configuration across spaces, but due to realignment of institutions allowing for improved capital, human, knowledge flow. Such an accommodation requires expansion of an institution (s) in expense of others within institutional environments with diverse trajectories. However, institutional change required does not imply that the configurations fostering them have similar arrangements among institutions. The expanding or accommodating institutions, and the degree of expansion/ accommodation all depend on the path travelled, the trajectory followed. Hence, the contestation is ever present even when there is harmony of practices across settings. And, this harmony is only transient.

CONCLUSION

As a final remark, we would like to emphasize that we do not argue for a marginalized relativist account of MNC expansion, but one that embodies the absence manifested in traditional MNC literature. We used different examples supported by theory to reveal a 'version' of what MNC is, what it can face as well as what target environment is and how it experiences the MNC and its expansion. This is an attempt to go beyond reification of the MNC and the contexts in which it exists with an aim to explore the endeavors of the MNC to exist across different contexts. We question the variance of what exists, is allowed to exist, across space and time.

ENDNOTE

1. Porsche as a tenth brand to VW, which already includes Audi, Bentley and Czech manufacturer Skoda, as well as the VW brand.

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Concurrent Engineering, LMX, Envy, and Product Development Cycle Time: A Theoretical Framework

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Concurrent engineering technique offers competitive advantage to organizations. The literature suggests that concurrent engineering practices are influenced by human and technical factors, which are present within a firm. Despite the importance of human factors, researchers typically have focused on operational and technical issues of implementation of concurrent engineering practices. More specifically, the role of human factors such as leadership, perceived equity and envy has not been explored in concurrent engineering context. Furthermore, the influence of envy on cross-functional team performance and product development cycle time has not been examined. To this end, the current study investigates the impact of leader member exchange on envy, and the outcomes of envy in terms of cross-functional team performance and product development cycle time. An integrated framework which would be beneficial to managers and practitioners is presented. Finally, we draw conclusions and present some avenues for future research.

INTRODUCTION

Manufacturing industries have been affected by numerous trends in recent times. One of the important trends to significantly influence the manufacturing industries is the reduction of product development cycle time. Concurrent Engineering (CE) practices have traditionally known to minimize the product development cycle time (Lawson & Karandikar, 1993; Kusiak, 1993). However, there have been instances where the implementation of CE have not yielded desired results in terms of reduction of product development cycle time (Braha, Klein, Sayama & Yam, 2003; James, 1999; Klein, Sayama, Faratin & Yam 2003, Maylor, 1997; Maylor & Gosling, 1998; Naveh, 2005). Mixed results may be because of the following reasons:

First, despite the presence of case studies and fact based research, plethora of studies have voiced concerns about lack of adequate attention to theory development and mechanisms involved in CE practices (Ford & Sterman, 2003; Koufteros, Vondersembse & Doll, 2001). Second and most importantly, despite the fact that CE is widely considered as a human and technology centered procedure (Jones, 1995; Vajna & Burchardt, 1998), researchers have mainly focused on technical aspects of CE and have commonly omitted the human factors such as emotions.

In a CE work settings, significant work is carried out by using cross-functional teams. Moreover, research has shown that when people work in teams with a similar objective, it leads to frequent work- or

non-work-related comparisons (Duffy & Shaw, 2000; Smith & Kim, 2007). Such comparisons can prove to be detrimental to one's self-esteem if the individuals find themselves on
the lower end in the comparison with others thereby giving rise to unpleasant envious emotions (Vecchio, 2000; Wood, Michaela & Giordano, 2000). From a psychological perspective, envy arises as a result of social comparison which is of unpleasant nature due to the fact that the comparison highlights one's deficiencies. Therefore, it becomes imperative to investigate the implications of negative emotions such as envy in the CE crossfunctional team context.

In addition an important aspect of crossfunctional team based environment is the relationship quality of the supervisor and the subordinates which is referred as leader member exchange (LMX). Research has shown that LMX has positive impact on team performance (Wayne, Shore, & Liden, 1997). As CE is mainly studied in a team context, LMX should have strong implications for the success of the CE initiative**.** Majority of the literature views LMX in a positive light (Gerstner & Day, 1997; Graen & Uhl-Bien, 1995) and does not venture into the "darker side" and more specifically the consequence of lower quality of LMX on organizational and team outcomes. This becomes very important as the lower quality of LMX has been linked with higher turnover intentions and reduced employee performance which can be a threat to organizational and team productivity (Kim, O' Neill & Cho, 2009; Mayfield & Mayfield, 1998). Also, research investigating the impact of quality of LMX on envy in the workplace context and particularly CE crossfunctional team context is scant (Kim et al., 2009; Vecchio, 1995). Furthermore, prior research does not delve into the dynamics of LMX- envy relationship, and therefore is of no assistance in unraveling the complexities that underlie this relationship.

To this end, the study has two major purposes. First, it examines the impact of leader-member exchange (LMX) on employee envy in the CE context. In the process, it also investigates the impact of equity sensitivity on the aforementioned relationship. Equity sensitivity is defined as an individual's tolerance towards equal treatment and is widely researched personality variable (Huseman, Hatfeild & Miles, 1987). It is vital to consider the equity sensitivity as past research has linked envy with personality factors (Mishra, 2009). However, more research is needed in order to clearly demonstrate the intriguing role that personality factors might play in envious feelings of an individual. Thus, we feel that equity sensitivity will play an important role in LMX -envy relationship because LMX deals with differing level of leader's treatment towards his subordinates**.** Secondly, the study also examines the impact of envy on cross-functional team performance and the desired CE outcome such as reduction in product development cycle time.

The study has some unique contributions to both the OM as well as the OB literature. First, majority of the existing literature on CE in OM focuses on defining CE, exploring the importance of CE, and highlighting the consequences of CE from a technical viewpoint (Bogus, Molenaar, & Diekmann, 2005; Koufteros, Vondersembse & Doll, 2001; Tan & Vonderembse, 2006). Little has been done to investigate the human mechanisms involved in CE practices. To this end, we seek to capture the role of negative emotions and its influence on organizational outcomes in the CE context.

Second, despite the universal nature and its impact on social interactions, envy has been relatively ignored from the mainstream research. Researchers have mostly focused on highlighting that envy can be instrumental in predicting important attitudes and behaviors (Vecchio 1995; Vecchio, 2000; Duffy & Shaw, 2000). However, more research is needed in order to better understand the dynamics underlying envious feelings.

Third, to the best of our knowledge, there is no published study that explores the relationship between LMX, envy and equity sensitivity. Also in a CE context, no study has thus far explored the impact of negative emotions such as envy on cross-functional team performance and competitive advantage factors such as product development cycle time. This study can be helpful to managers in broader as well as CE context as it will provide them a platform to understand how their differing relationships with employees can arouse invidious emotions within some employees, which in turn, can result in negative outcomes.

LITERATURE REVIEW

Leader-Member Exchange

Leader-member exchange theory, which was developed as an extension of vertical dyad linkage model, emphasizes the differing levels of relationship that form between leaders and their subordinates (Dansereau, Grean & Haga, 1975). The LMX deals with the degree to which leader and subordinate exchange resources and support beyond what is expected based on the formal contracts. LMX quality has been found to play an important role on employee performance (Gertsner & Day, 1997) and other outcomes such as employee attitudes (Dansereau et al., 1975). However, substantially less attention has been paid to impact of LMX on employee emotions such as envy (Kim et al., 2009). Also, as CE mainly deals with the use of work teams, LMX and employee emotions may have important implications in the CE context.

Envy

Envy is defined as "an unpleasant and often painful blend of feelings characterized by inferiority, hostility, and resentment caused by a comparison with a person or group of people who possess something we desire" (Smith & Kim, 2007, p. 49). It is generally considered a socially undesirable emotion and has been commonly experienced by most of the people regardless of their culture (Smith & Kim, 2007). From a psychological perspective, envy arises as a result of social comparison which is of unpleasant nature due to the fact that the comparison highlights one's deficiencies. It is commonly considered to be detrimental to the self-esteem. People feel envy when they notice an advantage being enjoyed by another individual (Smith & Kim, 2007). This advantage often gives rise to envy due to three main reasons. First, the individual is perceived to be similar in all aspects except for the advantage**.** Second, the advantage is related to a domain of high self-relevance. Third, the advantage seems to be beyond attainment by the individual. This coming together of similarity, high self-relevance, and low control creates a set of likely cognitive emotional appraisals and reactions which produce a blend of inferiority, hostility, and resentful feelings that is often given the label of envy (Smith & Kim, 2007). Given the fact that work scenario within the CE environment is characterized by highly interdependent cross-functional work teams, envy will have a strong potential to impact the CE outcomes.

Equity Sensitivity

Equity theory emphasizes that individuals evaluate their efforts and subsequent outcomes against the efforts and subsequent outcomes of their peers (Adams, 1965). When perceived in context of a CE cross-functional team setting, this theory suggests that employees compare their efforts and outcomes against their team members to find out whether they are being treated fairly. According to the equity theory, if the employees find inequity i.e. either they are being under rewarded or over rewarded, they will be motivated to restore equity (Adams, 1965). Based on the equity theory, Huseman et al. (1987) suggested that individuals are different in terms of their preferences for equity and coined this individual difference as 'Equity sensitivity'.

Cross-Functional Team Performance

CE practices, which include process and product development, involve the formation and utilization of cross-functional teams (Celtek & Kaynak, 1999; Harrell, Emanuel & Kroll., 1995; Swink & Sandwig, 1996, 1998; Wilson & Grey-Taylor, 1995). Cross-functional teams involve the integration of members from different functional backgrounds such as engineering, manufacturing, marketing, accounting and logistics. The benefits of cross-functional teams include a significant reduction in the development cycle time, product life cycle cost and engineering changes (U. Kumar, Fantazy, V. Kumar & Boyle, 2006). As companies focus on achieving high quality, fast product innovation and improved customer satisfaction, team performance becomes critical to realizing the above mentioned goals (Banker, Field, Schroeder & Sinha, 1996). Cross-functional team performance is operationalized in terms of degree to which goals set by the team are attained, the quality of the overall project, and the overall efficiency with which the team

conducts operations (Sethi, 2000; Sethi & Nicholson, 2001; Sethi, Smith & Park, 2001).

Product Development Cycle Time

Product development cycle time becomes extremely important as organization strives to launch product early in the market. It represents the average time taken by an organization to develop variety of products (Arditti & Levy, 1980; Brockhoff, 1967; Cohen, Eliashberg & Ho, 1996; Harter, Krishnan & Slaughter, 2000). If the product is launched early in the market as compared to other competitors, the firm has an advantage to learn from customer responses (Brown & Lattin, 1994). Other benefits identified

TABLE 1
DESCRIPTION OF DIFFERENT CONSTRUCTS USED IN THE STUDY

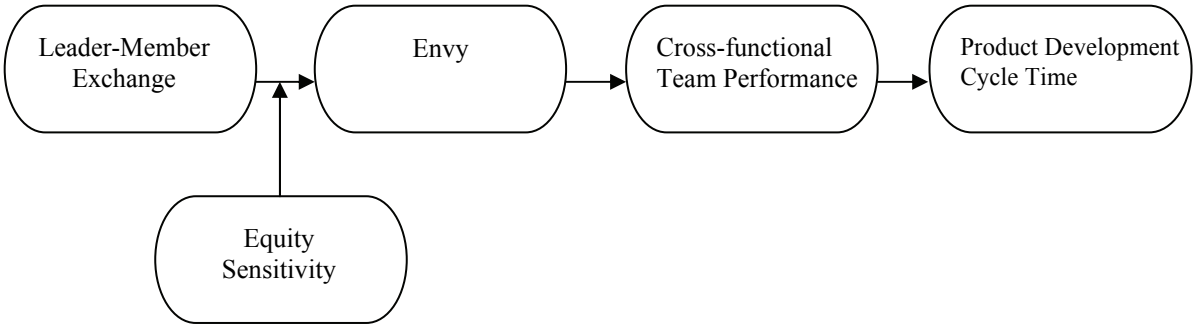
Research model constructs	**Description of construct**	**Vital Studies**
Leader member Exchange	Quality of exchange relationship between leader and its Subordinates	Dansereau, Graen, & Haga, 1975; Gerstner & Day, 1997; Liden, Sparrow & Wayne, 1997; McClane, 1991; Scandura,
Envy	A negative emotion felt when a person lacks another's superior quality, achievement, or possession and either desires it or wishes that	Vecchio 1995; Vecchio 2000; Parrott & Smith, 1993; Smith & Kim, 2007.
Equity Sensitivity	The individuals are different in terms of their preferences for equity. This individual difference is referred as 'Equity sensitivity'.	Huseman et al. 1987**;** Kickul & Lester, 2001; King, Miles & Day, 1993
Cross functional team performance	Deals with performance issues of teams such as cost savings, exceeding customer expectation, quality of work accomplished and meeting time line set in projects.	Ancona, 1990; Ancona & Caldwell, 1993; Banker, Field, Schroeder & Sinha, 1996; Early & Mosakowski, 2000; Hertel, Kondardt & Orlikowski, 2004; Linderman et al. 2003; Sherman, Souder & Jenssen, 2000; Stewart & Barrick, 2000; Oertig & Buergi,
New product development cycle time	The average time taken by an organization to develop variety of products.	Arditti & Levy, 1980; Brockhoff, 1967; Cohen et al. 1996; Harter, Krishnan & Slaughter, 2000; Itter & Larcker, 1997; Lilien & Yoon, 1990; Marco, 1993;

in bringing the products quicker to market include extended sales life of the product and increase in market share (Pawar, Menon & Reidel, 1994). Table 1 highlights the description of variables used in the study.

THE INTEGRATED FRAMEWORK AND THE PROPOSITIONS

For the purpose of developing the relationships, in addition to the operations management literature, organizational behavior literature, social psychology literature, and new product development literature were also considered. This approach was used to provide a detailed analysis of the propositions. The Figure 1 represents the integrated framework and the following subsection explores the relationships between different constructs. In additions, explanations for the relationships are also provided.

FIGURE 1
RESEARCH MODEL



Leader-Member Exchange and Envy

In a CE context and particularly in a cross-functional team setting the interactions between leaders and followers is extremely important. LMX is defined as the quality of exchange relationship between a subordinate and his or her immediate supervisor. LMX emphasizes that leadership effectiveness cannot be understood without examining how supervisors and employees influence each other over time (Danseareau, Grean & Haga, 1975). It is based on the premise that a supervisor has different type of working relationship with each subordinate within the same workgroup (Gerstner & Day, 1997). With some of the subordinates, leaders develop high quality LMX relationships in which reciprocal exchanges go beyond that is formally required in the organization, whereas with the other subordinates they share low quality LMX relationships which are limited in executing the tasks required by the formal contracts (Liden & Graen, 1980). High quality LMX is characterized by higher levels of trust, liking, commitment and respect (Grean & Uhl-Bien, 1995).

Empirical research has demonstrated that high quality LMX relationship fosters employee attitudes and behaviors, which are beneficial to leaders and organizations such as organizational citizenship behaviors (Deluga, 1994; Setton, Bennett & Liden, 1996; Wayne, Shore & Liden, 1997) higher performance and organizational commitment (Dienesch & Liden, 1986; Wayne, Shore, Bommer & Tetrick, 2002). In addition, subordinates having high LMX relationships are more likely than those in lower LMX relationships to receive challenging task assignments, training opportunities, resources, information and support (Liden, Wayne & Sparrowe, 2000; Scandura, Graen & Novak, 1986). Subordinates with high quality LMX relationships may actually perform better because of the added support, feedback, resources and opportunities provided to them (Feldman, 1986). Also, leniency bias appears to inflate performance ratings for employees with higher quality LMX relationships. However, in low quality LMX relationships, leaders rate members strictly according to established performance

standards (Duarte, Goodson & Klich, 1994; Heneman, Greenberger & Anonyuo, 1989). Given the fact that in most of the organizations, promotions and rewards are performance based; each employee within the same workgroup can realize which employees are receiving advantages because of supervisor's affinity towards them (high LMX). By comparing what they receive and what others receive, feelings of envy may arise. In addition, as a primary source of critical aspects regarding work, LMX can become a basis for comparison among each employee within the workgroup (Kim et al, 2009). When employees perceive that their relationship with the leader is worse (low LMX) as compared to their peers (high LMX), it will disturb their sense of balance (Heider, 1958), which ultimately will give rise to envious feelings. Cohen and Charash (2000) described following as an important condition of envy in a job promotion situation: 'When a person X notices that a similar other, person Y, gets promotion, which is important for a person X in such a way that X wants it but does not have, X is likely to experience envy' (Cohen & Charash, 2000; p 2). Thus, we propose

Proposition 1: In a cross-functional team setting, the quality of LMX will be negatively related to the employee envy.

Moderating Role of Equity Sensitivity

Equity sensitivity has an important role to play in the relationship between LMX and employee envy. As mentioned previously, equity sensitivity is the difference in individuals towards their preference for equity (Huseman et al., 1987). The term equity sensitivity is characterized along a continuum according to the outcome-input ratios. At one extreme of the continuum, there are benevolent individuals who prefer their outcome/ input ratio to be less than that of their peers, while on the other end of continuum, there are entitled individuals who prefer their outcome/input ratio to exceed the ratio of comparison others. In the middle end of the continuum are the equity sensitive individuals who prefer their outcome/input ratio to be equal to the ratio of their peers.

More recently, researchers have stressed that individuals differ in their tolerance for inequity rather than in their preference for inequity (King, Miles & Day, 1993). Various studies have utilized equity sensitivity as a moderator variable. For instance, Huseman et al. (1987) suggested that equity sensitivity moderates the relationship between perceived equity and attitudinal and behavioral outcomes. They stressed that lower equity sensitive individuals (Entitleds) would be more sensitive to unfair resource allocations because of their low tolerance for under reward. On the contrary, higher equity sensitive individuals (Benevolents) would be less sensitive to unfair reward allocations due to their greater tolerance for under reward (King et al., 1993).

O'Neil and Mone (1998) demonstrated that equity sensitivity had a moderating effect on the relationship of self efficacy with job satisfaction and intent to leave. Higher equity sensitive individuals were found to experience similar lower levels of job satisfaction and similar higher intent to leave regardless of their self efficacy. Also, Kickul and Lester (2001) explored the moderating role of equity sensitivity on the relationship between psychological contract breach and employee attitudes and behaviors. More specifically, they demonstrated the moderating effect of equity sensitivity on the relationship between psychological contract breach and job satisfaction. Taken together, all of these studies suggest that equity sensitivity is found to be a crucial factor in determining the strength of relationship between variables which deal with fairness of outcomes allocations. Thus, individuals who own an ethical predisposition of equity sensitivity are likely to be more concerned with the fairness of outcome allocations. These outcomes allocations can also be perceived as a result of exchange relationship between the leader and the subordinate. Previous research suggests that higher LMX is related to rewards such as receiving more resources to perform the task, higher performance rating, better training opportunities, information and support (Liden, Wayne & Sparrow, 2000). In a cross-functional team setting, if the employee is on the entitled end (lower equity sensitivity) of the continuum, he is will be more distressed due to the unequal treatment by the leader as compared to the team member who is on the benevolent end (higher equity sensitivity) which might affect his emotions strongly. Therefore, lower equity sensitive individuals are more likely to develop envious feelings against their peers who share a

better rapport with the leader, as compared to higher equity sensitive individuals. Consistent with this line of reasoning, we propose:

> *Proposition 2: In a cross-functional team setting, the effect of LMX on employee envy will be moderated by equity sensitivity such that effects will be stronger and more negative for individual with lower equity sensitivity (entitled) than for the individual with higher equity sensitivity (benevolent).*

Envy and Cross-Functional Team Performance

Envious feelings among team members can have strong implications towards the team performance. Experience of envy pertains to the feelings in which one's weaknesses or flaws dominate an individual's psychology. This often leads to low self esteem, anxiety, hostility, depression, and reduced self efficacy (Duffy & Shaw, 2000). Moreover, research has shown that feelings of depression and reduced self efficacy hamper with one's ability to perform well (Andrews & Wilding, 2004; Paton, 2009). Thus, we believe that the degree to which envious feeling intrude the ability to perform; increase in envy will be associated with reduction in team performance. This leads to the following

> *Proposition 3: Envy within the cross- functional team will be negatively related to cross-functional team performance.*

Cross-Functional Team Performance and Product Development Cycle Time

Organizations today are implementing techniques for integration of process, and product design. It has been mentioned that faster new product development can have significant effect on economic rewards. Introduction of product early to market helps company extend the product life cycle, develop and manufacture cost advantages and set premium pricing (Karagozoglu & Brown, 1993). Cross-functional team performance has been shown to be one of the enablers of product development cycle time (Denison, Hart & Kahn, 1996; Ittner & Larcker, 1997). The performance of the cross-functional team is found important to analyze different problems arising during product development cycle. Different individuals possessing expert knowledge in different fields share information and improve the efficiency of the design process (Brown & Eisenhardt, 1995; Clark & Fujimoto, 1989). Increase in cross-functional team performance is associated with reduction in product development cycle time (Denison et al.ww, 1996; Ittner & Larcker, 1997). This efficiency is achieved as members of the cross-functional team bring different perspectives from their own area of expertise (Denison et al., 1996). It helps to minimize the design errors and other bottlenecks associated with the new product development; and speeds up the decisions, which eventually improves the overall efficiency of the product development cycle (Blackburn, 1991). However, the cross-functional team performance has found to be deteriorated due to negative emotions such as interpersonal envy among the team members (Duffy & Shaw, 2000; Smith & Kim, 2007). This will minimize the efficiency of the product development cycle and increase the overall product development cycle time. Thus, it is imperative that increase in cross-functional team performance is associated with reduction in the product development cycle time whereas decrease in cross-functional team performance is associated with increase in product development cycle time. This leads to

> *Proposition 4: Decrease in cross -functional team performance will result in increased product development cycle time.*

DISCUSSION AND IMPLICATIONS

CE research is at crossroads. The motivation to carry out this study was due to the fact that even though organizations implement CE, there has been evidence of lack of desired results. Furthermore, as pointed out by Swink (1998) the implementation of CE practices is always replete with issues. Time and again researchers have highlighted the importance of human issues in the CE context (Mittal & Morse,

1992; Tayyari, 1992). More specifically, the research in the CE stream faces a challenge in terms of effectively identifying factors that are crucial for the functioning of CE teams.

The heart of CE is integration of all functions in product development stage (Lettice, Smart & Evans, 1995). Teams play a significant role in achieving the integration (Lettice et al., 1995). Considering the fact that CE involves investment in human expertise at all stages of the process, it becomes important to systematically investigate issues related to cooperation of team members. Personality factors, emotions, and supervisor-subordinate relationships are human issues crucial to any work scenario. Simultaneous consideration of LMX, envy, cross-functional team performance and product development cycle time in the CE context has somehow eluded the researchers. The present study can be viewed as an initial step in this direction. Human issues become especially important in a CE work setting because cross-functional teams are formed which differ from traditional teams in the following manner (Filipczak, 1996). During CE projects, individuals from diverse backgrounds work in association for long periods, sometimes ranging from months to years (Filipczak, 1996). Managers need to understand that in such cases providing a short teambuilding class is not the final solution. The understanding of underlying key mechanisms facilitating CE is critical.

To this end, current study is specifically designed to provide managers with an overarching framework for understanding the underlying mechanisms and particularly the impact of negative emotions such as envy. The study would enable managers to further understand some of the factors involved in a successful CE implementation. The importance of investigating potential linkages in the CE context is particularly relevant because it has direct impact on firm's financial capabilities (Koufteros et al., 2001).

From a human issue standpoint, we expect our study to emphasize that the quality of supervisor-subordinate relationship within a cross-functional team setting is related to employee emotions. Much of management and particularly OB research in the past has highlighted the positive side of LMX demonstrating that it has been related with increased job satisfaction, organizational commitment, organizational citizenship behaviors, employee performance, and lower turnover intentions (Gerstner & Day, 1997; Graen & Uhl- Bien, 1995). There has been paucity of research which focuses on LMX particularly in the context of an employee emotion (Kacmar, Zivnuska & White, 2007; Kim et al., 2009). Our study sheds more light on the view that LMX is an important factor in the arousal of invidious emotions within employees. Specifically, our study highlights that lower equity sensitivity can strengthen the relationship between LMX and envy. One of our contributions is in an attempt to examine the crucial role that equity sensitivity plays in the relationship between LMX and envy.

Since research has shown that envious feelings are likely to be nurtured when employees work in groups (Duffy & Shaw, 2000; Vecchio, 1995), work scenarios within cross-functional team settings serve as an ideal platform to give rise to such feelings. For instance as a part of their work, employees interact with each other frequently while regulating their emotions. Due to such demands, employees are likely to feel emotional exhaustion and burnout (Kim, 2008). Therefore, supervisor should strive to keep a regular watch on employee emotions by giving them personal guidance and counseling. Second, supervisors should design impartial and objective systems when assigning jobs, duties and responsibilities. The reasons behind why one gets some resources while others do not, should be clearly underscored by supervisors so that differences are understood by every employee, which in turn, will obviate or curb the arousal of invidious emotions. Third, supervisor should provide necessary training for employees which should convey the message that each employee is unique and valued. This should inhibit the envious feelings resulting from comparisons with others (Bedeain, 1995). Finally, informal meeting and social activities between supervisors and their subordinates should be promoted within the organizations (Kim et al, 2009). This will improve their relationship quality, which in turn, would reduce the likelihood of arousal of envious feelings.

Managers would be advised to develop strategies to promote positive emotions of individuals, allow people to develop feeling of connectedness and remove the fear of reprisal. Support to this can be found in psychology literature. For instance, a view from the regulatory theory in psychology mentions that individuals condition their emotional responses depending on the situation. There are basically two types

of forces: promotion regulatory forces and prevention regulatory forces (Brockner & Higgins, 2001). In promotion of regulatory forces the individual would try to promote positive emotions aligned with the goal of the organization (Brockner & Higgins, 2001). In addition, in the prevention regulatory forces, the individual would try to avoid any contradictory goals. Managers should specifically try to create an atmosphere, which encourages both the promotion and prevention regulatory forces. This is critical not only in the CE context, but also in a broader organizational context as goals of individual and that of organizations should match. One of the ways to create such an atmosphere is by providing positive feedback. It has been established that providing positive feedback about the self regulatory process to people would likely culminate into positive emotions (Brockner & Higgins, 2001).

The proposition that envy would negatively impact cross-functional team performance in a CE context provides interesting implications for managers. Care should be taken to select an employee for a CE project. It is imperative that managers employ individuals who work productively despite facing envy evoking situations. Particularly the hiring practices in a cross-functional team environment can involve providing personality measures test and selection of employees high in empathy towards others. Also emphasis should be given to staffing and selection of an employee who provides a good mix of experience and creativity to the product development teams. Thus, the proposition would further support the view commonly expressed in literature that effective management of human capital is critical for obtaining improved team performance and competitive advantage (Pfeffer, 1994; Reich, 1991).

Product life cycle has been identified as a basic fuel for industries (Brockhoff, 1967; Harrell & Taylor, 1981). Reduction of cycle time is one of the criterions along with others such as higher quality, lower cost to assess process improvement (Harter, Krishnan & Slaughter, 2000). The proposition on the linkage between cross-functional team performance and product development cycle time will further strengthen the view that cross-functional teams and their performance is critical to the reduction in product development cycle time. Thus, it is recommended that managers should not focus solely on reduction in product development cycle time from a technical standpoint. Instead such efforts should be coordinated with practices such as managing employee emotions to further receive benefits in terms of increased cross-functional team performance which will further lead to reduction in product development cycle time.

CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

In conclusion, today when most of the organizations are indulging in CE, it is believed that the success of CE depends on understanding a variety of mechanisms and their potential impact on important outcomes. Thus, it is important for managers to understand the effects of all these interrelated factors in the CE context. As pointed before, no study has simultaneously considered the interactions among the LMX, envy, cross-functional team performance, and product development cycle time in a unified context. In this study, we have highlighted LMX as an important antecedent of employee envy. Precisely, we concluded that low quality LMX can cause envious feelings among employees. In addition, we also have concluded that relationship of LMX and employee envy will become stronger with higher levels of equity sensitivity. Furthermore, we also argue that envy which results from a lower quality LMX will negatively impact cross-functional team performance. This deteriorated cross-functional team performance will increase product development cycle time. This study contributes to both the OM and OB streams of research. From an OM standpoint, this study supports the view that in addition to the technical problems, CE issues should also be investigated with the behavioral underpinnings (Lindermann, Schroeder & Choo, 2006). Moreover, OM scholars have called for incorporating human behaviors and emotions to provide better insights to OM concepts and practices (Boudreau, Hopp, McClain & Thomas, 2003; Schultz, Juran, Boudreau, McClain & Thomas, 1998). Our paper is an effort in this direction.

Second, we have extended the literature on envy in an OB context as most of the research on envy exists in anthropological and sociological literature. Also, we have added to equity sensitivity literature by establishing it as an important moderator between LMX and employee envy.

Despite the findings there are some major limitations which need to be emphasized. First, one of the

major limitations of the study is the conceptual nature. Second, by no means our model can be considered comprehensive. There can be other variables such as competitive reward system (Dunn & Schewitzer, 2004), various personality traits (Smith, Parrott, Diener, Hoyle & Kim, 1999), organizational perks which could act as antecedents of employee envy and can be considered in context of the framework. Third, research model presented in our study does not necessarily imply the causal relationship among variables. An empirical study which employs a longitudinal research design is required to verify the causal relationship. Fourth, the importance of contextual variables such as group cohesion and social loafing in reference to envy- team performance relationship is mentioned in the literature (Duffy & Shaw, 2000), however, these factors were not considered to maintain parsimony of the study (Levine & Moreland, 1990).

The study also provides foundation for some of the interesting avenues for future research. First, we found that low quality LMX can give rise to envious feelings among employees. However, previous research has shown that some people are predisposed for feeling envy (Smith et al, 1999). Therefore, it would be interesting to examine the dispositional envy as a moderator between LMX and envy. Second, the model proposed in this study can be tested in a cross-cultural settings, especially focusing on two culturally distinct countries. For instance, the proposed model can be tested in an individualistic versus collectivistic cultural settings (Hofstede, 1983) and results can be compared. As individualistic cultures emphasize that people place self interests before collective interests while opposite is true for the collectivistic cultures (Hofstede, 1983). It would be worthwhile to examine the impact of highly individualistic emotion such envy in two culturally distinct societies. Third, from an OM standpoint, as pointed out by Linderman et al. (2006) more organizational behavior theories can be used to investigate OM phenomenon. To this end, the interplay of challenging goals, LMX, envy and its impact on cross-functional teams in a CE context can be investigated. Also, the impact of technology variables such as CAD usage and their moderating effect on the linkage between cross-functional team performance and reduction in product development cycle time can be explored. Also, in a cross-functional team context, the project group composition and project size can also affect team performance and these variables can be considered for future research. We hope that this paper will serve as a foundation to attract the scholars from both OB and OM fields. This will be instrumental to advance the knowledge concerning leadership and employee emotions in the CE context beyond our initial efforts in the current research.

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The Integrated Propulsion Strategy Theory: A Resources, Capability and Industrial Organization

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Strategic management is dominated by three views, the Industrial Organization Theory, the Resource Based View and the Dynamic Capabilities Approach. While the Resource Based View and the Dynamic Capability Approach are often portrayed as sister theories, the Industrial Organization Theory is sometimes cited as a competing theory with respect to the others. Nevertheless, all three views are complimentary. This paper argues that positioning, picking and propulsion are all essential to a robust strategy and presents the Integrated Propulsion Strategy Theory that rigorously integrates these three pillars of strategy theory. The framework also introduces a coefficient to measure dynamic capabilities.

INTRODUCTION

The Resource Based View (RVB) is a decidedly inward looking approach to strategy. This is not surprising as it emerged as a reaction to the outward looking Industrial Organization (IO) approach epitomized in Porter's (1997) 'five forces model'. In contrast to the IO approach that is predicated on the analysis of the opportunities and threats the firm faces, the RBV focuses on the how the firm may harness its strengths and mitigate its weaknesses to achieve competitive advantage (Barney 1991).

The Dynamic Capabilities Approach (DCA) which emphasizes the mobilization of the firm's capabilities to achieve superior performance came as an extension to the RBV. While it recognizes the importance of developing unique, hard-to -copy resources and capabilities, the DCA contends that in and by themselves those characteristics do not provide the basis for sustainable competitive advantage in an environment of high velocity change (Teece, Pisano et al. 1997; Teece 2007). The key to sustainable competitive advantage from the DCA perspective resides in a kind of flexible tenacity, a perennial alertness and an evolutionary fitness that enable the firm to perpetually renew itself in order to establish and maintain extraordinary performance in an ever changing business environment.

Although there is clear complementarity between the IO Theory on the one hand, and the RBV and DCA on the other, IO Theory is sometimes presented as set of ideas competing with the other two theories (Teece 2007). Notwithstanding, a couple of theorists have tried to link these three pillars of strategy. Mahoney and Pandian (1992) highlighted scope for dialogue between the IO approach and RBV. Peng, Sun, Pinkham, and Chen (2009), note the emergence of institutionalism as a growing intellectual force in the field of management and contend that the 'institution-based view' along with the IO approach and RBV represent the theoretical tripod upon which strategy should be constructed. However, currently there is no overarching theoretical framework that rigorously integrates the RBV, the DCA and IO Theory.

It was Wernerfelt who pointed out that "[f]or the firm, resources and products are two sides of the same coin" (Wernerfelt, 1984, p.171) Indeed, this succinctly captures the duality which exists between the outward looking IO theory and the inward looking RBV approach. It also highlights the conceptual futility of trying to isolate the product from the resources that makes the product possible. Another way to think about strategy is to see it as a painting of the landscape. A painting based on perspective has three elements – a foreground, a background and a set of invisible lines that link the background to the foreground. In this respect, IO theory might be considered the foreground, RBV the background and the DCA the unseen force that connects the background to the foreground. A picture of the landscape with any one of these elements missing will lack reality and appeal. In the realms of strategy all three approaches, whether 'intended' or 'emergent', are critical in the fashioning of superior firm performance in an environment of turbulence and shifting equilibria. It might be further argued that the defining feature of IO theory is 'positioning'(Porter 1981; Porter 1996; Porter 1997); for RBV it is resource 'picking' (Barney 2001; Makadok 2001); and for DCA it is 'propulsion'. This paper presents the Integrated Propulsion Strategy Theory that attempts to bring these three strands of strategy together in a consistent and harmonious analytical framework based on these three 'Ps' – positioning, picking and propulsion.

The Integrated Propulsion Strategy Theory is constructed on principles used in economics, notably indifference curve analysis. This paper begins with a literature review. It is followed by the presentation of the theoretical framework for the proposed integration of the three dominant approaches to strategy. This framework also introduces a coefficient designed to measure the manifested dynamic capability of a firm.

LITERATURE REVIEW

The Anatomy of the Integrated Propulsion Strategy

Strategy, within the domain of business, is everywhere and at all times a calculated set of actions or a deliberate orientation on the part of a firm to seek out and to appropriate rent (Mintzberg 1987; Mahoney and Pandian 1992) . The IO approach to strategy emerged out of neoclassical economic theory of the firm. E. S. Mason, one of the early IO theorists, emphasized the influence that various structural factors within the industry have on the performance of the firm. Later Joe Bain provided impetus to the approach by narrowing down the drivers of performance to a few key structural factors (Porter 1981). Schumpeterian repudiation of a static view of the firm and its perspective that the industry is unrelentingly shaped by the evolutionary process of 'creative destruction' has also had an influence on the development of IO theory (Conner 1991). However, much of the contemporary discussion on IO theory swirls around Michael Porter's 'five basic forces' paradigm, arguably because of its deft abstraction of the untidy and complex reality of industry dynamics. Needless to say, Porter's contribution to IO theory was built on the work of his predecessors, particularly Bain's 'structure-conduct-performance' model and the Learned, Christensen, Andrews and Guth framework (Porter 1981; Conner 1991; Teece 2007).

According to Porter the 'five forces' paradigm competition arises from the bargaining power of customers, the negotiating strength of suppliers, the allure of substitute products, the threat of potential new entrants to the market and the rivalry among existing competitors in the industry (Porter 1997). Competitive advantage is therefore dependent on the firm's ability to locate itself in a unique position in the industry that allows it to dilute the competition and amplify its market power. Consequently, IO theory is rooted in the capacity of the firm to sense the opportunities and threats in its external environment and position itself to transcend the ordinary in order to register sustained and superior returns on investment over time. However, the IO approach, particularly as expressed in the Five Forces framework, implicitly conceptualizes the market structure as a reality that is exogenously determined. In this respect, it ignores several essential dimensions of market dynamics that are determined or shaped by endogenous factors such as the role of complementarities, path dependencies and supporting institutions (Teece 2007).

In contrast to the IO approach that emphasizes the threats and opportunities in the industry, the RBV stresses that competitive advantage comes from how the firm handles its strengths and weaknesses to achieve resources heterogeneity (Barney 1991; Peteraf 1993; Hoopes, Madsen et al. 2003; Lee 2008).

The RBV is derived from Ricardian Economics which highlighted the importance of 'superior resources' to the attainment of high economic rent (Barney and Arikan 2001). This occurs when the firm is able to acquire resources below the value of their marginal productivity and combine them with the other resources it possesses to earn a superior rate of return (Makadok 2001; Denrell, Fang et al. 2003). Edith Penrose, in the late 1950's, out of a disenchantment with the neo-classical economic approach to the growth of the firm, embarked on a different analytical path which laid the foundation for the emergence of the RBV. While neoclassical economics with its smooth continuous production functions, its well-behaved demand and supply curves and its marginal mechanism for adjusting output to optimize profit, still remains a useful analytical tool, it cannot adequately explain the nature of how the firm develops. Penrose therefore provided an alternative explanation which stressed the potential that resides in the productive resource bundles controlled by the firm and the critical function that the administrative framework plays in coordinating the firm's productive resources to its benefit (Barney and Arikan 2001).

The RBV essentially channels strategic energy into resources as opposed to the product, gives pre-eminence to the attributes of value, rareness, inimitability and non-substitutability in the management of resources, and emphasizes the adept manipulation of resources and capabilities within the firm over opportunistic positioning within the industry (Wernerfelt 1984; Barney 1991). It is therefore evident that the central thesis of the RBV is the picking of resources that confers heterogeneity to the firm.

While there has been general agreement among academics and practitioners in the field that the RBV is essential to competitive advantage, questions have been raised as to its capacity to sustain and support competitive pre-eminence in the context of globalization, rapid technological change and sporadic market upheavals (Teece, et.al, 1997; Lee, 2008). In fact, there is compelling evidence that suggests that the process of 'creative destruction' is accelerating and the lifespan of even the most successful firms is progressively becoming shorter (Beinhocker 2007). It is against this backdrop that the DCA was proposed.

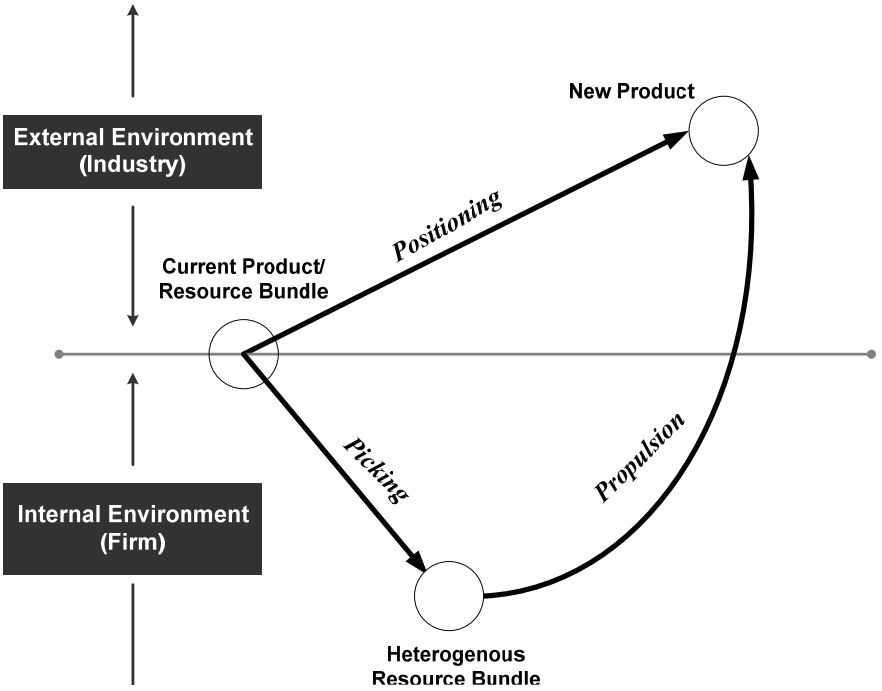
The DCA is rooted in the Schumpeterian perspective of the business environment and is constructed on the premise that it is the adroit deployment the firm's resources and capabilities that provides the source of sustained success. It highlights the critical importance of competencies that transcend technical capabilities and infuse the firm with nimbleness, innovativeness and evolutionary fitness for it to thrive. In this respect, the DCA is often viewed as an extension of the RBV (Teece 2007).

Indeed, all three strategic outlooks are valid. Furthermore, in the context of a turbulent, ever changing business environment it is unlikely to achieve resilience and robustness through the myopic engagement of single approach. A classic example of the ephemeral nature of business success and the perpetual need for firms remain on the very frontier strategy is the crisis Nokia faced at the end of the first decade of the twenty-first century.

Early in 2011, the CEO of the Nokia, Stephen Elop, announced that the Finnish mobile phone manufacturing company was faced with a serious crisis. Nokia's profits had plummeted to an unthinkable level. But what could have caused such a dramatic change in fortune for an organization that only recently was the world's most profitable mobile phone company? One person might say it no longer occupies a unique position in the market. Another person might say it lacks heterogeneous resources. Still another person might suggest that it is bereft of the dynamic capability to address the upheavals taking place in the industry.

Prior to becoming a global mobile manufacturing company, Nokia produced paper, rubber products and electrical cables. With the advent of mobile phones based on first generation technology, Nokia had the dynamic capability to propel itself to a position of competitive advantage. First generation phones were based simply on talk and text which did not require technological sophistication. Nokia's competitive advantage came from its ability to make cheap and robust handsets by virtue of its manufacturing roots.

FIGURE 1
THE THREE Ps OF THE INTRGRATED PROPULSION STRATEGY



A number of things have brought about turbulence and intense competition in the market. First, the Taiwanese company, MediaTex, has been able to produce mobile phones cheaply based on inexpensive chips. These phones have been eating into Nokia's market share in developing countries. In addition, Huawei, a Chinese company, has been expanding into the telecom market in Asia. Nokia therefore faces unprecedented rivalry at the low end of the market.

Second, with the advent of smartphones, driven by powerful microprocessors, the whole telecommunication landscape is changing at the top end of the market. Customers are not merely interested in mobile phones they want handheld computers. The 'Android' based on Google's operating system, and more importantly, the iPhone manufactured by Apple sent shockwaves through the market. Apple with a global market share of only 4% accounted for more than 50% of the profit in the industry in mid 2011.

The challenge that Nokia and Stephen Elop faced in 2011, was how to build the operating capabilities to develop the software and provide the data service required at the top end of the market where most of the industry value exists. The integrated approach contends that to regain competitive advantage Nokia would have to confront the imperative of the 3P's; (1) *Positioning* – relocating itself in new space in the industry; (2) *Picking* – putting together a bundle of heterogeneous resources and operational capabilities that supports its external positioning; and (3) *Propulsion* – developing and launching the dynamic capabilities required to unite heterogeneous resources with unique position to achieve a competitive advantage (see FIGURE 1).

The Body and Soul of Strategy

The distinction between resources and capabilities in Strategic Management literature is sometimes hazy. Barney for instance, following R. Daft's cue makes no clear distinction between the two:

> "*firm resources* include all assets, capabilities, organizational processes, firm attributes, knowledge, etc. controlled by the firm that enable the firm to conceive of, and implement strategies to improve its efficiency and effectiveness" (Barney,1991, p.101).

Teece et al (1997) took the definition of resources to the other extreme by narrowing it down to firm-specific assets that are hard to copy or replicate. The description offered by Amit and Schoemaker (1993) posits that resources are inputs owned by, or are under the control of, the firm which transforms them through the production process into products. Resources are 'observable' and can be 'valued and traded'. Although observable they include, but are not confined to tangible factors. Consequently, resources may also include intangible assets (Makadok 2001; Helfat and Peteraf 2003; Hoopes, Madsen et al. 2003). This definition is more consistent with the neoclassical economic notion of resources and is less restrictive than the one presented by Teece and his colleagues. It is therefore considered, for the purpose of this paper, to have more analytical value.

In contrast to resources, capabilities are intangible and non-observable; they are resistant to monetary valuation and cannot be traded except in their entirety (Hoopes, Madsen et al. 2003). This is to say that if a firm wants to get the exact capabilities that resides in a unit of a competing company they cannot be replicated simply by hiring a couple of the workers. It would require the acquisition of the entire unit. Organizational capability is the ability to coordinate the tasks performed by the firm and exploitation of the available resources to achieve a well defined output or outcome (Helfat and Peteraf, 2003). In this regard, organizational capabilities are 'firm specific', 'socially complex' attributes which 'reside within corporate culture and network of employees'(Amit and Schoemaker 1993; Collis 1994) . As such, organizational capabilities are built rather than bought (Makadok 2001).

The firm does not exist except for resources, and even if resources are present it cannot produce without organizational capabilities. Resources are observable and substantial inputs. Capabilities tend to be nebulous and harder to pin down. Metaphorically speaking resources are the body and capabilities are the soul of strategy.

Restrict Flights, Propulsion and Better Engines

The unfolding discussion on organizational capabilities points to the existence of three types of organizational capability; (1) operational (or zero level) capabilities, (2) first level dynamic capabilities and (3) higher level dynamic capabilities (Collis 1994; Winter 2003; Teece 2007; Helfat and Winter 2011).

Operational capabilities are those competences that allow the firm to reliable and satisfactorily produce its products. These are really ordinary capabilities that enable the firm to make a living in the present (Winter, 2003).

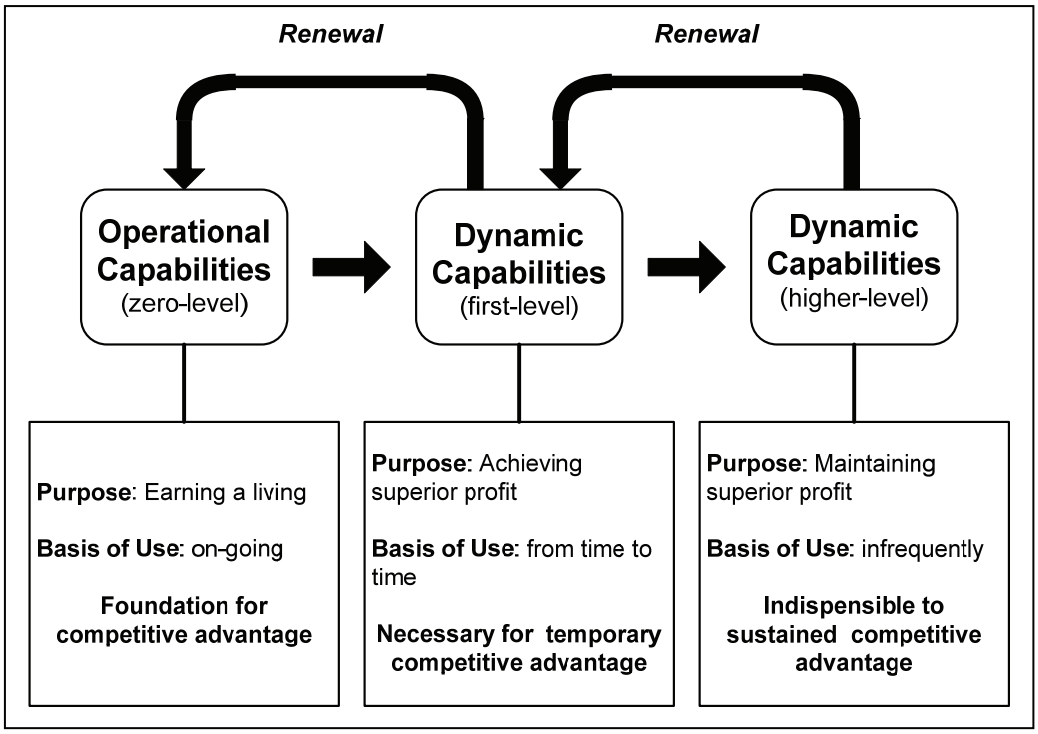
First level dynamic capabilities refer to the set of competences that allows the firm to shift from one set of operational capabilities to another in order to achieve or maintain superior performance (Collis 1994). This requires the capacity to innovate, integrate and transform resources in order to address changes in the external environment. These competences are required for propulsion. Teece (2007) also suggests that dynamic capabilities are not only shaped by the external environment, but they also to shape the business ecosystem and are required for achieving superior performance.

Higher level dynamic capabilities are the set of metaphysical competencies which are more sophisticated than first level capabilities. These are complex competencies that provide the basis for continual renewal. To use the analogy of an airplane; operational capabilities could be considered similar to the internal systems that permit an aircraft that to fly within a restricted zone, like other aircraft in its classification. First level dynamic capabilities, on the other hand, allow propulsion beyond the restricted zone of the initial operational capabilities into a zone beyond the range of comparable aircraft. However, given the dynamics of the market over time the competition tends to catch up and the operational capabilities achieved through propulsion eventually becomes congested and restricted.

Higher level capabilities are the competences that allow for the creation of newer more sophisticated engines which will lead to greater propulsion. This is the only set of competences that will continually

provide the mechanisms for repeated propulsion and sustained competitive advantage. Leonard-Barton (1992) points to the danger of core competencies becoming core rigidities which present an obstacle to innovation. By dint of the fact that first level dynamic capabilities involve some degree of patterned behavior and advanced routines they are vulnerable to fossilization (Barkema, Baum et al. 2002). The hardening of first-level capabilities robs the firm of the competences necessary to adapt, innovate and channel the resources it possesses in a way that ensures advantageous industry alignment and superior performance. Higher level dynamic capabilities are the competences that replace fossilized components within first-level capabilities mechanism with newer, more flexible, more powerful parts allowing the firm to transcend the gravitational pull of failure and mediocrity. As shown in FIGURE 2, higher level capabilities renew first-level capabilities, which in turn renew operational capabilities.

FIGURE 2
THE RENEWAL OF CAPABILITIES



THEORETICAL FRAMEWORK

Resource-Capability Bundle

Neoclassical economics posits that the firm's output is constrained by cost and there is a trade-off between capital and labour in the production process (Arrow et al 1961). However, from the point of view of strategy the neoclassical analysis defines the firm's resources much too narrowly and is predicated on a mechanistic approach to the determination of output that reduces its explanatory power in relation to growth. It may be argued that growth in the firm tends to be organic and the trade-off between resources is better conceived in broader terms. Consequently, the trade-off in the framework presented below is considered to exist between capital resources and operational resources.

Capital refers to long term investments in are firm that is used up in the production process over a number of years. As such it includes items such as plant, tools, and machinery, which are often referred to

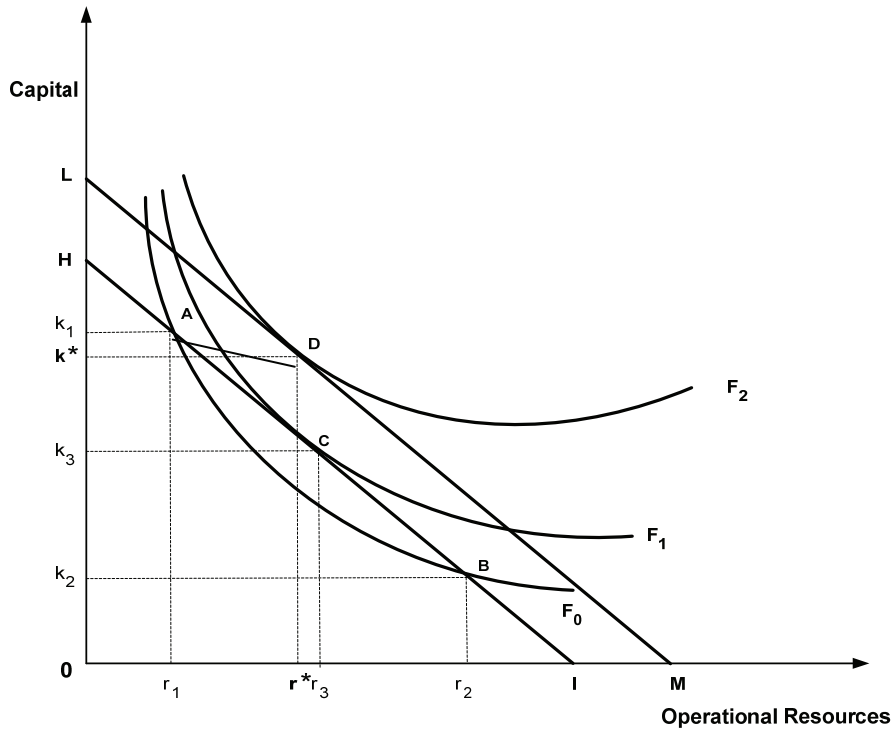
as physical capital. In addition, it includes organizational capital, which consists of the long term structures and systems in the firm that facilitate planning, controlling and coordination.

Operational resources are short term inputs that allow the firm to execute its day to day functions. These resources are not difficult to replace. Operation resources include inputs such labor, raw material, maintenance services and outsourced services.

Capability arises from the need to combine the firm's capital and operational resources. Depending on the firm's expenditure any given combination of these two types of resources yields a resource-capability bundle that produces the firm's output.

The analytical approach used in this framework is similar to the one employed in neoclassical economics in relation to indifference curve analysis and production theory analysis. As shown in FIGURE 3, a firm with cost **HI** could chose to produce a set of products based on resource-capability bundle **A** (with resource $\mathbf{r_1}$ and $\mathbf{k_1}$) or another set of products derived from resource-capability bundle **B** (with resource $\mathbf{r_2}$ and $\mathbf{k_2}$). As such, capital resources and operational resources are substitutable. However, some minimum threshold of capital and operational resources would be required to make production possible.

FIGURE3
ACHIEVING COMPETITIVE ADVANTAGE



Profitability Functions

The firm's profitability is a function of its operational and capital resources embodied in the product it produces. The profit the firm makes comes from the juxtaposition of the revenues earned from the product its sells against the cost of its resource-capability bundle. It is therefore the interaction between the firm's resource capability bundle and the forces within the industry that determines its profitability. The firm's profitability (F), shown in FIGURE 3, is a function of variables described in Porter's 'five-force model': customer preferences, suppliers' decisions, substitute products, potential new entrants and existing competitors. In addition, it includes complementary products, the action of cooperators, and

institutional factors. While the market responds to learning and innovation (Teece 2007) the influence of these elements is captured in the variables identified above that determine profitability. For example innovation might expand customer preference for a product, or learning on the part of a competitor could increase competition.

The firm occupies a resource–capability space in which there is an infinite series of profit curves (F_0, F_1, F_2 . . . ,) with higher curves showing greater profit (see FIGURE 3). Like indifference curves, profit curves are convex to the origin and cannot intersect. Despite the name, a profit curve might be negative (show a loss) or positive (show a profit). The shape of the profit curves and their positions are determined by the forces at work in the industry. The profitability attained by the firm depends on the interaction between the firm's resource-capability bundle and the market, as depicted by the point at which its resource bundle touches the profitability curve. A firm can achieve the same profit level (as is the case for **A** and **B**) with different resource-capability bundles although its overall cost is same.

Competitive Advantage

In FIGURE 3 it is assumed that initially the firm is producing its products using resource-capability bundle **A**. The position of resource-capability bundle **A** in relation to the profit curve, $\mathbf{F_0}$, indicates the level of profit the firm enjoys. It should be pointed out that unless a firm commands superior levels of profitability it does not have a competitive advantage. Therefore, assuming $\mathbf{F_0}$ does not give the firm a competitive advantage but $\mathbf{F_1}$ and all higher profit curves do, then the firm would have to transition its resource-capability bundle from **A** (or **B** for that matter) to a higher profit curve to achieve a competitive advantage. To achieve competitive advantage the firm could do one out of two things. First, it could maintain the same level of cost (**HI**) by trading off some of its capital resources (i.e. moving from $\mathbf{k_1}$ to $\mathbf{k_3}$) for more operational resources (i.e. moving from $\mathbf{r_1}$ to $\mathbf{r_3}$), thus transitioning resource-capability bundle **C** . Consequently, the firm would move to a higher level of profitability, $\mathbf{F_1}$. In trading off capital resources for operational resources the firm could get rid of a factory that produces a component of its product and outsource that particular service. This kind of improvement in profitability which allows firm remained on the same cost line **HI** in moving from **A** to **C** may be the result of strategic tinkering, which Winter (2003) refers to 'ad hoc problem solving'.

Alternatively, the firm could achieve a higher level of competitive advantage by increasing its overall investment by moving to a new cost line **LM**. This allows the firm to move from operational-capability bundle **A** to **D**. The process of propelling the firm from one level of investment to another to profit curve, $\mathbf{F_2}$, would require greater dynamic capabilities. In moving from resource-capability bundle **A** to **D**, the firm would reduce its investment in capital from $\mathbf{k_1}$ to $\mathbf{k^*}$ and simultaneously increase its use of operational resources from $\mathbf{r_1}$ to $\mathbf{r^*}$. The new product or processes resulting from the firm's action would yields superior profit and is likely to be higher than the outcome from 'ad hoc problem solving'.

Measuring Dynamic Capability

Inherent in the concept of dynamic capabilities are two essential dimensions. First, it has a vector dimension that is manifested in the movement from one operational capability to another (i.e. the line **AD** in FIGURE 3). This dimension which reflects the firm's transition from operational-capability bundle **A** to **D** is measured by what will be referred to as the *Dynamic Propulsion Coefficient* (**DPC**). Second, dynamic capabilities should reflect how the action of the firm impacts relative profit. This dimension is critical since ultimately dynamic capability is not an end in itself, but it is harnessed to acquire, maintain or improve profitability. As such, this dimension is simply called the *Relative Profitability Factor* (**RPF**). Therefore, of necessity, a proper measure of dynamic capability must consider both propulsion and relative profitability.

In FIGURE 3 the movement from operational capability **A** to **D** is the resultant effect of a change in operational (horizontal) resources and capital (vertical) resources. As shown in FIGURE 4 the **DPC** is the hypotenuse which is defined here as the square root of the sum of the percentage change squared of operational and capital resources (expressed as costs).

FIGURE 4
THE DYNAMIC PROPULSION COEFFICIENT

$$\mathbf{DPC} = \left[\sqrt{\left(\frac{\Delta r}{r1}\right)^2 + \left(\frac{\Delta k}{k1}\right)^2}\right]$$

Where, $\Delta r = r_1^* - r_1$ and $\Delta k = k^* - k_1$

The *Relative Profitability Factor* may be expressed as; **RPF** = $\Delta\pi$

where, $\Delta\pi$ is the change in profit expressed as the rate of return on investment (i.e. $\Delta\pi = F_2 - F_0$)

It is therefore proposed that the *Dynamic Capability Coefficient* (**DCC**) is the product of the **DPC** and the **RPF** (see FIGURE 5).

FIGURE 5
THE DYNAMIC CAPABILITY COEFFICIENT

$$\mathbf{DCC} = \Delta\pi\left[\sqrt{\left(\frac{\Delta r}{r1}\right)^2 + \left(\frac{\Delta k}{k1}\right)^2}\right]$$

By virtue of this construct, if **DCC** is zero, provided that the firm has changed its level of investment, then the firm is only able to maintain its competitive position. In other words, the firm has propelled itself from one resource-capability bundle to a next only to remain in the same place. This is sometimes referred to as the 'red queen effect' (Barkema, Baum et al. 2002; Beinhocker 2007; Teece 2007). If the **DCC** is positive then the firm has improved its competitive position. However, if the **DCC** is negative then the firm has failed in its effort to maintain or improve on its competitive position in the industry.

There is a time component to the **DCC**, however, because depending on the capital intensive nature of the firm and the nature of its operation the measure of long run may vary. To apply the **DCC** empirically it therefore will require an industry specific time definition by the researcher.

The dynamic capability demonstrated by a firm indicates what it has achieved in the past and might not necessarily be a good indication of what is capable of doing in the future. The **DCC** is a useful strategic tool in assessing a firm. However, it is limited in the sense that it only measures first level dynamic capabilities. It cannot capture higher level capabilities which are indispensible to sustained competitive advantage. Nevertheless, there is room for research aimed at determining whether firms exhibit different propulsion coefficients at various stages of the growth cycle. There is also scope for research into the association between propulsion and the firm's longevity based on the measure proposed in this paper.

DISCUSSION

Excessive Cost and Resource Irrelevance

Implicit in the Integrated Propulsion Strategy framework are a short run and a long run assumption. First, there is the short run assumption that a resource-capability bundle may be valuable, rare, inimitable and non-substitutable but it only gives the firm a temporary competitive advantage. Barney (1991 and

1999) points out that heterogeneous resources and capabilities may be difficult or even impossible to replicate perfectly because of the factors of historical uniqueness, path dependency, causal ambiguity and social complexity. However, Barney and others concede that, if not substituted, idiosyncratic resources might be overcome through the acquisition of the firm by a competitor (Markides 1990; Collis and Montgomery 1995; Barney 1999).

Second, there is the long run assumption that all resources and capabilities can be imitated, substituted or acquired but a firm may opt not to do so because of excessive cost or resource irrelevance. A particular set of resources and capabilities becomes excessively costly when the investment expenditure involved in their acquisition is so high that it is not consistent with the goal of competitive advantage. Acquisition cost often involves not only the actual price tag on the firm but there may be indirect cost associated with factors such as 'excess baggage' or the purchasing resources not directly relevant to the firm, 'difficulties in leveraging acquired capabilities' and moral hazards that results in the lowering of the value of the resource after the acquisition.

In thinking about excessive costs consider the attempt by Microsoft, the world largest software company, to takeover of Yahoo in 2009. This acquisition thrust was born out of a recognition of the weaknesses in its internet search services. The takeover of Yahoo's superior search operations and enormously profitable internet advertising business would enable it to compete more effectively with Google, the world leading online search company. While Yahoo entertained the possibility of a takeover, and saw its share price soar during the negotiations, it rejected Microsoft's final offer of US$47.5 billion. Yahoo's decision was made on the grounds that the offer was below the value they assigned to the company, only to see their share price tumble after this revelation. It is likely that that the deal would have gone through if Microsoft's offer was higher, say 10% more. However, paying more than US$47.5 billion would evidently have militated against Microsoft's goal of competitive advantage in search services because of the excessive cost involved. In the end Microsoft opted for a strategic alliance with Yahoo which left the resources and capabilities Microsoft wanted to develop outside of its boundary.

Another factor that might prevent one firm from imitating or acquiring an idiosyncratic resource-capability bundle is the notion of resource irrelevance. This refers to the fact that time might render a particular resource of little or no value after it is acquired in a turbulent, high velocity environment.

To illustrate the concept of resource irrelevance let us imagine the case of Book-A-Million, Inc. (BAM) the third largest book store chain in the USA, deciding in the early 1990s to imitate the scope of Barnes and Noble (the No.1 book retail chain) by acquiring Walden Bookstores a smaller chain owned by the Borders Group. Let us say the acquisition was achieved and BAM considered the deal a success, then the victory would be transient. With the explosion of dotcom companies and the advent of Amazon, high volume book sales shifted from block and mortar stores to internet firms. As such, the competitive advantage BAM intended to achieve through a block and mortar network would not have been realized because of the phenomenon of resource irrelevance.

Static and Dynamic Capabilities

A firm must have static capability to exist in the short run. However, it takes dynamic capability to achieve long run competitive advantage. Static capability or organizational capability is simply the ability of the firm to reliably put together a resource bundle that will generate revenues. If the business environment is stable, assuming that the firm has already attained a competitive advantage, static capability is all that is necessary to maintain the same position in the market (see FIGURE 6A). However, if the industry is shaken by industry change arising from Porter's five forces as well as other factors such as modifications to the institutional framework or changes in complementary products, then the profitability curves will shift (see FIGURE 6B) causing the firm to lose its competitive advantage. It is in this context, that the integrated approach involving industry positioning, resource picking and strategic propulsion is advantageous. The integrated approach provides the firm with the perspective and balance needed to maintain a competitive advantage through the adept reconfiguration of its resources and capabilities in a way that enables move to a superior resource-capability bundle (i.e. from **C** to **E**). When this is achieved the firm is so positioned that resources are in harmony with the company's product, and

fleeting though it may be, the firm will enjoy extraordinary profits until again the industry is shaken by change. It is in this regard strategy at its best requires vigilance, perspicacity and agility.

FIGURE 6A
FIRM BEFORE INDUSTRY CHANGE

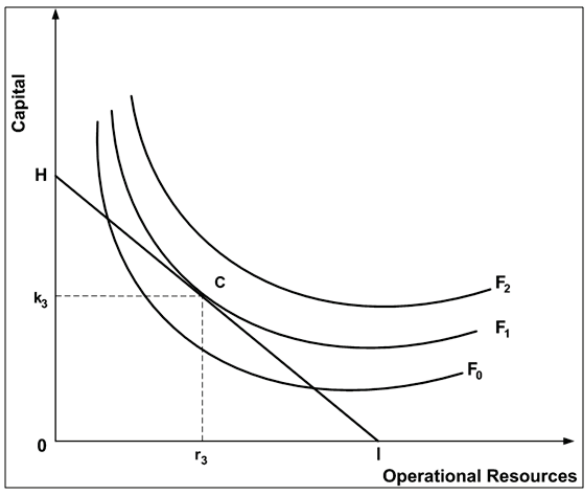
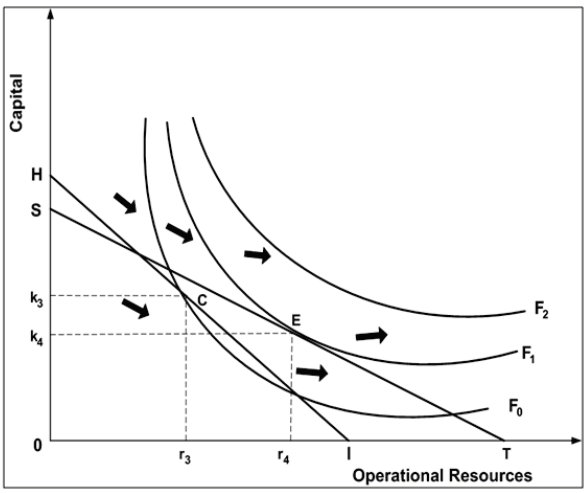


FIGURE 6B
FIRM AFTER INDUSTRY CHANGE



CONCLUSION

All successful strategies whether knowingly or unknowingly involve the IO approach, RBV and DCA. When there is a shift in the industry it requires the IO approach to analyze the situation and determine where the firm is and where it should be (industry positioning). It takes RBV to decide on the resources and operational capabilities required to take it to the new position (resource picking), and in the end, it takes the DCA to move the firm's resource bundle to the new position (strategic propulsion). It therefore may be argued that it is only when all of these elements are consciously taken into account in the fashioning of strategy that the firm can be made robust and dynamic enough to properly address a perpetually shifting business landscape.

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ACKNOWLEDGEMENT

I would like to express appreciation to Professor Paul Simmonds and Professor Evan Duggan for their guidance and encouragement in writing together this paper. I am also indebted to Murad Mithani and a trio of blind reviewers at the Southern Management Association Conference 2011 for their incisive criticism and constructive comments.

The Role of Resource Profiles in Creating Competitive Heterogeneity Within Strategic Groups

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This paper posits an integrated view of intra-industry competition, in which one can define the competitive strategy of any individual firm in terms of a combination of competitive positioning in the product/market space and profiles of key resources. We examine this by analyzing the patterns of firms' commitments with respect to these two dimensions of competitive strategy, in the form of product/market-based and resource-based configurations—i.e. strategic groups—within an industry. The two types of strategic groups are found to be nearly orthogonal, supporting our contention and suggesting that intra-industry competition can be depicted as an integration of these two key firm strategy decisions.

INTRODUCTION

The strategic group concept has been the subject of much debate over the past twenty-five or so years. Researchers have found varying degrees of support for the robustness and stability of strategic groups and for the relationship between group membership and performance, leading many to question the validity of the construct and its usefulness in strategic management research (Barney & Hoskisson, 1990; Hatten & Hatten, 1987; Ketchen et al, 1997; McGee & Thomas, 1986; Tang & Thomas, 1992; Thomas & Venkatraman, 1988). However, supporters of the strategic group concept remain, and several studies have attempted to address critics by either: 1) developing more rigorous analytical methodologies; 2) arguing for more sophisticated, integrative conceptualizations; 3) proposing alternative approaches for identifying configurations which demonstrate higher "face" validity; and/or 4) using more fine-grained techniques for examining the elusive relationship between group membership and performance.

As a result, we now have more complex, multi-faceted frameworks of intra-industry structure, a seeming plethora of means for identifying configurations within and industry, a array of terminologies for those configurations, more rigorous processes for conducting such analyses, and multi-level approaches for identifying performance differences among and between groups. We can now talk about "competitor groups" (Porac et al, 1989), "competitive groups" (Leask & Parker, 2007), "cognitive groups" (Bogner & Thomas, 1993; Osborne, Stubbart, Ramaprasad, 2001), "cognitive communities" (Nath & Gruca, 1997), "resource groups" (Mehra, 1996), and "strategic scope groups" (Hoothoofd & Heene, 1997), in addition to the traditional "strategic groups." Sometimes these groups represent common strategies, sometimes they are meant to reflect patterns of competitive interaction, and sometimes they are intended to encompass both.

Furthermore, some researchers have linked together these efforts and argued that strategic groups should be modeled and examined through multiple means, that there should be congruence across these alternative configurations, and that such congruence should be associated with performance differences across groups (Nath & Gruca, 1997; Osborne et al, 2001; Short et al, 2007). Others have integrated the resource-based view into the strategic group concept and its basis of mobility barriers, arguing that stable strategic groups only exist when the two are codetermined (cf. Bogner, Thomas, & McGee, 1996; Maijoor & van Wittelstoon, 1996; Mehra & Floyd, 1998).

Taken as a whole, a broader picture emerges from this recent work – that theoretically robust and practically meaningful strategic groups should display convergence across various configurations: whether they be derived from structural product/market variables, perceptual measures of firm attributes, assessments of inimitable resources, networks of directly-identified competitors, or content analysis of cognitive themes. In addition, convergence across alternative configurations should be associated with performance differences between strategic groups.

In this study, we respond to this emerging development in strategic group theory and propose an alternative view. In particular, the assumption that the theoretical concept of strategic groups necessarily implies or is contingent upon the kind of convergence outlined above is questioned. Common strategic positioning in the product market space of the industry is not assumed to have an association with archetypal bundles of firm resources and capabilities, as some have suggested (Mehra, 1996; Leask & Parker, 2007). In fact, if firms in the same strategic group have the same or very similar sets of resources upon which they are competing, then these resources cannot be considered "inimitable," at the least, and cease to be truly "rare" if they are too widely shared. The consequence is that the economic rents earned by a resource unprotected by rarity and inimitability become dissipated in the market, and the supernormal profits that are the visible evidence of competitive advantage disappear. A more logically consistent theoretical view is that, in an industry earning sustained economic rents, firms with similar resources and capabilities cannot be closely juxtaposed in their market position. That is, firms that are competing in the same product/market space must have different bundles of resources upon which they compete, or their rents would be dissipated by rivalry.

As others have previously argued (e.g., Barney & Hoskissen, 1990; Bogner et al, 1996), we believe that the strategic group concept has been too closely associated with industrial-organization-[IO]-derived notion of mobility barriers (Caves & Porter, 1977; Mascarenhas & Aaker, 1989), such that the two constructs have become nearly inseparable and synonymous. Several scholars have aimed to supplant this IO-perspective with a resource-based view of strategic groups (Amit & Shoemaker, 1993; Bogner et al, 1996; Mehra & Floyd, 1998), arguing that commitments of unique resources are a more valid proxy for delineating and differentiating strategic groups and their performance differences (Cool & Dierickx, 1993; Rumelt, 1984). This study builds on these works, arguing that firms make several different types or categories of strategic decisions and commitments and that these are not necessarily codetermined. More specifically, we frame firm-level competitive strategy as consisting of two separate issues: i.e., that a firm's decision regarding its product market positioning is a separate decision from the way in which it will employ its unique resources and capabilities to compete in that product market space. To the degree that both of these issues are components of firm-level strategy, and to the degree that there may be patterns or similarities in these two types of decisions across an industry, the idea of strategic groups should be seen as at least a two-dimensional construct.

That is, one strategic group configuration can be derived that meaningfully represents similarities in how firms position themselves in the product market space of an industry, while another very different set of strategic groups can be derived that accurately reflects archetypal commitments to and deployments of resources and capabilities. Furthermore, because both differences in how firms position themselves as well as what unique resources they employ may affect the competitiveness of the firm, both factors should influence performance. In fact, rents will only be sustainable in an industry when these two configurations have minimal overlap or convergence. Firms within an industry that choose to compete with one another in the same markets and with the same products or services, with business models based

on similar profiles of resources, are engaging in direct competition, and the end result would likely be diminished returns for all parties involved.

THEORETICAL BACKGROUND

As stated above, this paper is, in large part, a response to the decade-long expansion in the variety of ways of conceptualizing intra-industry structure – and more specifically, recent attempts to re-examine the strategic group concept and bolster its relevance by proposing and demonstrating convergence across different types of groups or alternative methods of forming such groups. These ideas largely assume an integration of firms' competitive positioning in the product-market space, their resource commitments and core capabilities, and their identity or reputation relative to the cognitive maps of managers. We argue that there is not necessarily a strong theoretical argument to support such a synthesis. Instead, we propose that these various structures should be decoupled and studied as separate-but-related phenomena, which may or may not overlap and interact with one another.

To fully explicate the situation and provide a rationale for our research, a brief review of recent work is required. To begin with, some have simply interpreted the problem with strategic group research as rooted in methodological issues, arguing for more careful selection of variables and more rigorous analytical techniques (e.g., Ketchen et al, 1997; Wiggins & Ruefli, 1995). As such, some scholars have attempted more sophisticated and fine-grained means of parsing out performance effects at different levels of analysis, the results of which demonstrate general support for strategic group configurations (Hoothoofd & Heene, 1997; Maijoor & Van Witteloostuijn, 1996; Nair & Kotha, 2001; Ruefli & Wiggins, 2003; Short, et al, 2007).

Other researchers have conceptualized intra-industry structure in multiple ways, proposing more nuanced views of strategic groups. In particular, some have argued for integrating the resource-based view (Barney, 1991), so that the strategic group represents common profiles of resources and capabilities (Bogner & Thomas, 1993; Mehra, 1996). Interestingly, the execution of such an approach often fails to completely incorporate these intentions. In one typical example, Bogner, Thomas, and McGee (1996) examined strategic groups that incorporate managers' "evaluations of resources"; and yet most of the variables chosen were related to structural, product-market characteristics of the firm's strategy.

Along similar lines, and often inter-related with the idea of integrating the resource-based view, several scholars have re-examined the relationship between strategic groups and inter-firm rivalry (Cool & Schendel, 1988; Lawless, Berg, & Wilsted, 1998; McNamara, Deephouse, & Luce, 2003; Smith et al, 1997). Much of this work shows that rivalry within groups is more significant than rivalry between groups, suggesting that rivalry and intra-industry structure should be decoupled. These studies typically leave the traditional IO notion of strategic groups relatively intact, but propose that rivalry is best modeled at the level of the firm and its resources.

Other researchers have expanded the conceptualization of strategic groups by grounding such configurations in managers' shared mental maps of the industry (Porac, Thomas, & Baden-Fuller, 1989; Reger & Huff, 1993). This line of research repeatedly demonstrates that such consensual maps of industry structure do exist (McNamara et al, 2003; Osborne et al, 2001). However, these configurations tend to largely reflect patterns of rivalry—rather than archetypal strategies or resource profiles, and as such are typically called "competitor groups."

Finally, a few scholars have argued for and demonstrated convergence across different types or means of forming strategic groups. Nath and Gruca (1997) propose that inherent in the definition of strategic groups is that firms in a given group follow a similar strategy, and that this similarity should manifest itself in a variety of ways. Thus, firms with similar scope and resource commitments should share similar cognitive structures, and these two configurations should converge with maps of similar competitors. Similarly, Osborne et al (2001) argue for and demonstrate convergence between group structures derived from "performance-based" measures and "cognitive mental models". Mehra and Floyd (1998) provide some theoretical logic to buttress such arguments for convergence, arguing that theoretically meaningful strategic groups will only exist when there is sufficient product-market heterogeneity in the industry and

such product market positions are associated with unique configurations of inimitable resources. Furthermore, they state that "absent the existence of relatively inimitable resources underlying a group's position … there will be no significant performance differences between any groups" (1998: 518).

In sum, although there has been an increasing recognition of multiple ways of conceiving of intra-industry structure, there is still a relative lack of consensus over how to model such plurality within strategic groups. In general, research has advocated either a plurality of methodology or a plurality of constructs, or sometimes both, but not multi-dimensionality of the strategic group construct itself. Some researchers have articulated multi-faceted views of industry structure, but take groups formed on the basis of a common strategy (i.e., strategic groups) and compare them to groups representing constructs such as "competition" (Leask & Parker, 2007), "strategic scope" (Hoothoofd & Heene, 1997), or "core versus secondary positions" (McNamara et al, 2003). Thus, a firm's "strategy" is but one basis for configurations of groups within an industry, and additional or alternative configurations are grounded in other constructs, such as rivalry or niche width or reputation.

We argue that a more logical and straight-forward approach is to see strategic groups as a *multi-dimensional construct*, such that there are multiple aspects of firm-level strategy which lend themselves to common configurations. More specifically, we begin with the recognition that there are at least two very significant dimensions to firm strategy: competitive positioning in the product-market space and value creation through a set of resources and capabilities. This fairly straightforward argument has been largely overlooked and unincorporated in research on strategic groups. Scholars have either failed to conceptualize intra-industry structure in such a two-dimensional manner, or they have imposed an artificial requirement of congruence on such multi-dimensionality, as noted above. To complicate matters, there is the assumption that strategic groups, however they are conceived, necessarily imply performance differences.

We propose that what is needed is a framework that defines strategic groups on the basis of multiple aspects of strategy. By that we mean, the term "strategic group" needs a qualifier: what type of strategic group are we referring to? To be sure, some attempts have been made to conceptualize intra-industry structure at multiple levels or along multiple dimensions, as we noted in our prior discussion, but these have tended to reflect different levels of abstraction (e.g., Hoothoofd & Heene, 1997) or different aspects of the value chain (e.g., Mehra, 1996).

A recent study by Leask and Parker (2007) has offered a somewhat similar argument, stating that within an industry there are "competitive groups" which "are made up of firms that compete in the same market segments and that offer direct substitutes for one another," and strategic groups, which represent differences in strategic commitments and actions. The authors see the former as "demand-side" groupings, based on product market space and competition for customers, and the latter as "supply-side" groupings, which reflect commitments of resources and capabilities and mobility barriers that restrict firms from imitating their rivals. However, only one of these configurations was considered to reflect a firm's "strategy" – the other was meant to represent common competitors.

This study seeks to build on Mehra's (1996) initiative and the recent work by Leask and Parker (2007), conceptualizing strategic groups along two distinct dimensions, while providing a more complete examination of the degree of congruence between these two types of configurations. We identify two strategic group configurations within a somewhat unique and yet aggressively growing industry: ornamental horticulture or nursery growers. Using firm-level structural variables (e.g. size, scope, product mix, and market channels), we develop *product/market-based strategic groups*. In addition, using managers' evaluations of their firm's resource-based strategies, we develop *resource-based strategic groups*. Our analysis of these product/market and resource group structures responds to recent criticisms of the use of cluster analysis in strategic group research. Furthermore, we introduce a novel approach for comparing different group structures and evaluating the degree of similarity or congruence across these configurations.

METHODS

Researchers have noted several problems with strategic group research methods, in general, and with the use of cluster analysis, in particular (Barney & Hoskisson, 1990; Ketchen & Shook, 1996; Thomas & Venkatraman, 1988; Wiggins & Ruefli, 1995). Following guidelines suggested by these and other researchers (Aldenderfer & Blashfield, 1984; Romesburg, 1984), we endeavored to enhance the reliability of both the product/market-based and resource-based strategic group solutions by performing multiple analyses and comparing their results. Specifically, we compared configurations derived using different subsets of variables, both standardized and unstandardized versions of those variables, two distance measures, and three clustering algorithms. Furthermore, we implement a process for visually examining and statistically testing the level of congruence among these various solutions.

With respect to our resource-based strategic groups, although the resource-based view has become increasingly more theoretically refined, researchers have made little progress in operationalizing constructs for measuring potentially inimitable resources and capabilities. Many have used archival measures as proxies for such resources (e.g., Leask & Parker, 2007; Maijoor & Van Witteloostuijn, 1996; Miller & Shamsie, 1996), but this does not necessarily reflect the inherently "behavioral" nature of the resource-based approach (Penrose, 1959; Wernerfelt, 1984) and also fails to capture intangible resources and capabilities (Hall, 1993; Itami & Roehl, 1987). Thus, we derive our resource-based strategic groups using managers' ratings of an array of tangible and intangible resources and capabilities.

Context

To examine the relationships between product/market groups and resource groups, we conducted a survey of the ornamental horticulture (nursery) industry in a Midwest US state. Nurseries grow a variety of ornamental plant products (primarily trees, shrubs, and groundcovers) which are sold to an array of end-users (homeowners, landscapers, builders, municipalities, etc.). We found this industry to be particularly appropriate for study because it is highly segmented and has been characterized by industry leaders as having a high degree of strategic diversity (Mehra & Floyd, 1998). In addition to this apparent intra-industry heterogeneity, the industry had been experiencing continuous growth and profitability.

The survey was sent to the presidents or CEOs of 350 nurseries in the state. We believe that, as Hambrick and Mason (1984) have argued and others have agreed (e.g., McNamara et al, 2003; Mehra & Floyd, 1998; Porac et al, 1989), top managers are best equipped to provide the kind of data that captures the firm's strategic posture and intentions. This sample was randomly drawn from a complete list of over 600 nursery growers licensed by the state's Department of Agriculture. We received 130 responses for a total response rate of 37%. After removing surveys with significant amounts of missing information, there were 108 useable surveys for an effective response rate of 32%. Although this response rate is not unusual for such industry surveys, there is the possibility of response/non-response bias. However, comparisons with Census of Agriculture data suggest that the sample is representative of the state's nursery industry. Specifically, the combined acreage of field-grown nursery stock for the 108 respondent firms represents 58% of the total acreage in the state, the acreage of sod grown by respondents constitutes 55% of the state total, and the area of greenhouse production is 50% of the state total.

Measures

To form the two types of strategic groups, we employed two very different sets of measures. For the product/market-based groups, we used quantitative indicators of product/market-based strategic decisions; and for the resource-based groups we used managers' ratings of resource-based priorities and commitments. As noted above, both sets of data were gathered via surveys completed by CEOs or top-management-team members; however, the first set of questions elicited straightforward facts about the firm, while the second part of the survey consisted of perceptual evaluations.

First, we assessed product-market groups using measures of a firm's business scope and their deployment of assets: size characteristics (acres, locations, employees, etc.), product and service lines (field stock, greenhouse plants, sod, etc.), and distribution channels (retail v. wholesale). We build on the

logic offered by recent researchers (Leask & Parker, 2007; Mehra & Floyd, 1998; Osborne et al, 2001) and argue that these measures capture the degree of business diversification (or lack thereof), as well as the firm's relative emphasis on scale and scope versus differentiation. Second, we derived our resource-based groups using managers' evaluations of key strategic factors (cf. Mehra, 1996; Nath & Gruca, 1997). We asked managers to rate the relative importance of several kinds of tangible and intangible resources and capabilities for their firm's strategy. Factor analyses of these variables placed them in five "bundles" of resources and capabilities, and the factor scores were then used as the basis for forming resource-based groups. Descriptive statistics for the product-market and resource-based variables are provided in Table 1.

Third, we collected information on firm's competitive groups by asking managers to identify up to five of their closest rivals (Nath & Gruca, 1997; Osborne et al, 2001), and 87 of 108 firms (81%) identified at least one key competitor (the modal response was two and the median was three). We used this data essentially to validate the strategic groups derived from the other forms of data, rather than as the basis for actually forming group structures.

We also asked for self-report estimates of several measures of performance. Since all of the firms in the nursery industry are privately-held, there are no publicly available financial data. As a result, we were restricted to gathering performance data strictly via primary sources. Furthermore, many leaders in the industry suggested that asking managers to provide specific information (e.g., actual business volume or net profits) would jeopardize the response rate of the survey. Thus, following Venkatraman and Ramanujam (1986), we gathered indicators of both financial performance (sales/revenue) and operational performance (market share and efficiency), by asking respondents to indicate by what percentage did their firm's gross sales, market share, and operating cost structure increase or decrease over the previous year. While we recognize that this is not an ideal measures of performance, it is consistent with past research that has noted the reliability and validity of using top-managers' self-reports in the absence of objective indicators (Dess & Robinson, 1984; Venkatraman & Ramanujam, 1986).

Cluster Analysis Procedures

As noted above, all cluster analyses were performed following guidelines suggested in prior research (Aldenderfer & Blashfield, 1984; Romesburg, 1984; Thomas & Venkatraman, 1988). In particular, Ketchen and Shook (1996), identified several critical factors which can enhance the reliability of the analyses and the validity of the final group structures: 1) performing analyses on different sets or combinations of variables, 2) analyzing both standardized and unstandardized forms of these variables, 3) conducting analyses using multiple similarity measures, 4) developing cluster solutions based on several clustering algorithms, and 5) performing both inductive (bottom-up) and deductive (top-down) types of cluster analyses. To the degree that the consequential cluster solutions are consistent across all of these permutations, the robustness and reliability of the group structures is enhanced. Interestingly, relatively few studies have thoroughly executed such an approach (see Leask & Parker, 2007; Osborne et al, 2001; Short et al, 2007, for notable exceptions). Following Ketchen and Shook (1996), we incorporated all of their guidelines and assessed the degree of consistency across the cluster solutions that resulted.

In our analysis, similarity matrices were computed using both the Euclidean distance and squared Euclidean distance resemblance coefficients. The similarities were calculated based on different combinations of variables, comparing the resulting cluster solutions to determine which set produced the most stable outcomes. Additionally, the analyses were performed on both standardized and unstandardized data. Finally, the cluster solutions were formed through a two-stage process, beginning with an inductive (hierarchical agglomerative – HA) analysis using three different clustering algorithms, the results of which were then confirmed via a deductive (iterative partitioning – IP) clustering technique. The HA cluster solutions were formed using the three most common algorithms: the unweighted pair-group, complete-linkage, and Ward's methods (Aldenderfer & Blashfield, 1984; Romesburg, 1984). There was a strong degree of similarity in results across the three methods. Following standard guidelines (Aldenerfer & Blashfield, 1984; Ketchen & Shook, 1996: Romesburg, 1984), we used both visual inspections of dendograms and gaps in the agglomeration coefficients to determine which HA cluster

solutions were most accurate. Then, the cluster means from the HA analysis served as initial centroids for the IP cluster analysis.

Reliability of Cluster Analyses

As noted, to make a final determination about the number of clusters and to assess the robustness and reliability of our group structures, we compared the cluster memberships of a wide range of solutions (across the five factors outlined above), assessing the degree of congruence between them. While scholars have suggested performing these different analyses and assessing the consistency of the results as a means of producing more reliable cluster solutions, there are no definitive mechanisms for making comparisons among cluster solutions. To address this issue, we introduce a two-part process. First of all, we use sunflower plots as graphical means of assessing the degree of congruence between any two cluster solutions (see e.g., Figure 1). In these plots of one set of group memberships against another set, instances where group memberships coincide will appear as "flowers" – with each case being a "petal" on the flower.

Secondly, we use two related measures of association for nominal variables – Goodman and Kruskal's *lambda* and *tau* (Leibetrau, 1983; Reynolds, 1984), as statistical tests of such congruence. The two measures evaluate "the relative usefulness of one variable in improving the ability to predict the classification of the members of the population with respect to a second variable" (Leibetrau, 1983:17). Although there are several other measures of association of nominal variables, and Osborne et al. (2001) use Cramer's V, we use *lambda* and *tau* for three main reasons: 1) they have asymptotic distribution properties that permit significance tests; 2) they can be used to assess tables with unequal rows and columns (as is often the case when comparing cluster solutions); and 3) they are among the most conservative and robust measures of association (Leibetrau, 1983; Reynolds, 1984).

Performance Differences and Validity of Cluster Analyses

As previously noted, the argument among many researchers is that *post-hoc* tests for performance differences are a necessary condition for assessing the validity of strategic group structures, regardless of the types of groups or the basis upon which they are formed. We conduct such tests, performing a Kruskal-Wallis non-parametric ANOVA on the three self-report performance measures described above, for both product/market- and resource-based strategic group configurations. We also compared the two types of strategic groups with patterns in firms' self-identified "closest competitors", in a process very similar to Osborne et al (2001), as a means of assessing the validity of these structures. Due to the facts that, 1) firms were only asked to identify up to five of their most significant competitors, 2) a few firms (less than 20%) declined to identify any competitors, and 3) some of the identified competitors (e.g., Wal-Mart) were not included in the sample, we could not use this data as an accurate indicator of validity, nor could we use it to generate a separate group structure in and of itself.

RESULTS

In the analyses of both product/market- and resource-based strategic groups, stable cluster solutions emerged, using the multi-stage analytical process detailed above. As a means of providing additional support for the discriminant validity of both types of strategic groupings, we performed MANOVAs on several variables that were held out from any of the other analyses (e.g., number and ratio of personnel categories) and found significant differences across the groups (Thomas & Venkatraman, 1988).

Product/Market-Based Strategic Groups

Strategic groups based on product-market positions were identified through a cluster analysis of seven business structure variables: specifically, indicators of production capacity and product mix (field stock, sod, container, and greenhouse products) and business diversification (wholesale plant sales, retail plant sales, and related landscaping distribution channels). Several iterations were run excluding one or two of these variables, with only minor effects on group membership. The dendogram plots of cluster

memberships indicated that a nine-cluster solution provided enough fine-grained detail, and the clusters were robust across various clustering permutations. Specifically, the Goodman-Kruskal *lambda* and *tau* statistics comparing various nine-group clustering solutions (using different subsets of variables, resemblance coefficients, and clustering algorithms) were significantly higher (> .840; $p < .000$) than those for the seven, eight, and ten group solutions, suggesting that a nine-group structure was, in fact, the most reliable and robust solution.

Additionally, we performed an IP cluster analysis, using the HA cluster means as initial centroids. A sunflower plot comparing cluster memberships computed by the HA and IP methods showed only eight "off-diagonal" observations (four "centers" and four "petals") that correspond to differences in group membership between the two analyses. Thus, the strategic group solutions appear to be congruent, and the Goodman-Kruskal *lambda* and *tau* statistics were highly significant (> .820; $p < .000$).

We also examined these product/market group memberships (displayed in Table 2) to establish their "face validity". Using the self-identified competitor data, we found that: 1) firms which are known or perceived to be competitors typically fell into the same product/market group; 2) in over half of the groups, firms explicitly indicated that other group members were their key competitors; and 3) in all groups, members indicated either common or highly similar competitors. For example, eight of the ten members of Strategic Group 3 listed the exact same firm as their most significant competitor, all of the firms in Groups 6 and 8 identified at least one group member as a competitor, and almost all of the firms in Group 5 identified a major discount retailer, such as Wal-Mart or Builder's Square, as a key competitor.

Finally, we examined differences across groups with respect to the three performance measures - changes in sales, market share, and costs, using the Kruskal-Wallis non-parametric ANOVA procedure. Not only were the overall chi-square statistics for all three measures not significant, but pairwise comparisons of all group means using the Mann-Wilcoxon procedure showed no significant differences. Thus, while the rigorous cluster analyses produced product/market groups that were robust and had high face validity, there were no significant performance differences between these groups. This is consistent with prior studies which have shown a lack of performance variations across strategic groups. It suggests that the ways in which firms positioned themselves in the industry had little effect on the level of competition and consequential performance.

Resource-Based Strategic Groups

The responses to the resource-based survey items were first factor analyzed to determine the underlying structure of the data. The 20 items loaded on five factors, accounting for 72% of the overall variance among the items. These five factors represent "bundles" of resources and capabilities upon which we derived our resource-based strategic groups. Reliability measures (Cronbach's *alpha*) for three of the factors were moderate to high, ranging from .681 (Marketing) to .916 (Social Complexity). The Economics and Physical Assets factors, however, had more modest reliabilities of .534 and .560 respectively (see Table 1).

The actual values of the five factor means were not the basis for clustering. Rather, we were concerned with a firm's *relative weighting* or pattern of prioritization across the five factors, because individual managers will likely have a framing bias that will cause their responses to be unevenly dispersed. To remove the effects of this bias, we standardized all of the factor means by case. Clusters were then formed following the same multi-stage process used for the product/market-based analysis.

The dendograms indicated that a six or seven cluster solution had the best balance of differentiating between firms while providing ease of interpretation. As in the case of the product/market groups, various solutions based on different subsets of variables, resemblance coefficients, and clustering algorithms were compared to each other for a six- and seven-cluster model. Also, the group factor means for both six- and seven-cluster solutions were used as initial centroids for an iterative partitioning analysis, and the HA and IP solutions were compared to one another. A six-cluster solution provided the highest *lambda* and *tau* (> .900; $p > .000$).

Additionally, we compared the resource group cluster memberships (shown in Table 3) with the self-

identified "closest competitors" data. Unlike the product/market-based groups, there was very little commonality in identified competitors - i.e., firms in a given cluster indicated a diverse array of competitors. Thus, although the multi-step cluster analysis procedure produced robust resource-based strategic groups, the lack of congruence between these resource groups and the identified competitors raises interesting questions about what these groups represent and implicate, which we discuss at length below.

Finally, we assessed performance differences across the resource-based strategic groups. In contrast to the results from the product/market groups, the resource-based configurations displayed significant differences across groups for all three measures: change in sales ($F = 2.983$, $p < .015$), change in market share ($F = 3.585$, $p < .005$), and change in costs ($F = 2.962$, $p < .016$). Interestingly, Group 6, the "isolated" resource-based cluster, reported the greatest increases in sales and market share, while Groups 2 and 4, the "economics-focused" and "production-focused," had the lowest increases (see Table 4). In fact, the firms in the "production-focused" group were the only ones that reported *decreased* sales and market share. These findings have several significant implications with respect to sustainable competitive advantage and inter-firm rivalry, and we discuss them more fully below.

Comparisons of Product/Market and Resource Groups

Finally, we compared the memberships of the two types of strategic groups (see Figure 1). We were interested in examining the degree to which the firms that made up a given product/market group, who had adopted a similar strategy of positioning in the product-market space, were also members of a common resource-based group, and thus were competing on the basis of similar commitments of resources. Because the number of product/market groups (nine) is greater than the number of resource groups (six), there obviously cannot be a one-to-one correspondence. Here the Goodman-Kruskal measures become particularly important as means of measuring association, in that their accuracy is not affected by asymmetric tables.

On both axes of the sunflower plot in Figure 1, the memberships represent the IP (as opposed to the HA) cluster solutions. If members of product/market-based groups were also members of the same resource-based groups, they would plot in the same "flower". Instead, the graphical comparison indicates very little congruence between the two types of strategic groups. Furthermore, the *lambda* and *tau* statistics are statistically insignificant ($p < .400$). Taken together, these analyses indicate that firms in each of the product/market-based groups employ a wide range of resource-based strategies. Conversely, members of a given resource group are competitively dispersed throughout the product-market space.

DISCUSSION

This paper set out to explore the fundamental structure of intra-industry competition by examining two aspects of strategies upon which individual firms attempt to compete within the nursery industry setting. Operating on the premise that there are particular configurations or archetypes of competitive strategy within an industry, we explored the structures of these strategic groups using two distinct approaches. The product/market-based approach, using market positioning variables, resulted in strategic groups that had a high degree of both internal consistency and external "face" validity, thus seeming to accurately map the competitive landscape of the nursery industry. The resource-based approach, using variables grounded in the resource-based view of the firm, produced a group structure that, although lacking the "face" validity of the strategic groups, was also internally reliable and robust. Interestingly, when plotted against one another, the structure of membership in product/market-based strategic groups was significantly incongruent with the structure of the resource-based groups.

The almost complete orthogonality of these two group structures challenges many of the assumptions of recent research, which has argued for congruence across different types of strategic groups. Instead, the results provide support for recent research which conceptualizes patterns of competition in more multi-multi-faceted ways. We argue that within a given product/market-based strategic group there may be an array of resource-based profiles upon which firms compete. To the extent that there are many such

resource-based strategies within a product/market group, there will be greater economic rents available to firms in the group. By extension, if all the product/market groups show such resource-based strategic heterogeneity, the industry overall will be healthy, profitable, and attractive.

Methodological Contributions

This study makes at least three significant methodological contributions to research on strategic groups. First of all, the analysis here explicitly compares two very different types of group structures - one based on product-market characteristics and the other derived from resource commitments. Given the relative paucity of resource-based examinations of strategic groups, particularly with respect to using measures grounded in the reality of the industry, this study provides a possible framework for subsequent analyses of resource groups.

Secondly, this study sought to ensure the reliability and validity of the competitive group structures that were obtained using cluster analysis. As previously stated, several researchers have suggested guidelines for improving the quality of cluster-analysis-based work. Specifically, Ketchen and Shook (1996) delineate at least eight distinct issues that researchers should address when using cluster analytic techniques. Unfortunately, only a few studies have implemented these suggestions (Mehra, 1996; Ketchen et al, 1997; Leask & Parker, 2007; Short et al, 2007). In this particular study, we responded to all eight of Ketchen and Shook's key issues and applied theirs and others' guidelines to our cluster analyses. By performing dozens of replications of the cluster analyses (using different subsets of variables, different resemblance coefficients, and different clustering algorithms), conducting both HA and IP analyses, and comparing these cluster solutions with external criterion variables, this study provides an example of how to follow recently-proscribed methodologies for cluster analysis.

Finally, a novel method for comparing multiple cluster solutions and evaluating their congruence was employed. Specifically, we used sunflower plots to visually depict similarity and the Goodman-Kruskal *lambda* and *tau* measures to statistically test such congruence. The use of these test statistics provided a means of assessing the robustness and reliability of the reported clusters of strategic archetypes. Moreover, the *lambda* and *tau* statistics were employed to show the degree of congruence (or lack thereof) between product/market-based and resource-based strategic groups.

Theoretical Contributions

This study also makes some theoretical contributions to research on both the strategic group concept and the resource-based view. First, the results of this study inform the current and growing interest in the resource-based view of the firm, by building on and extending Mehra's (1996) notion of "resource groups." Our findings support his contention that while firms may compete on the basis of inimitable resources, there appears to be, in some industries, very similar resource-based profiles which can be used to group firms and their strategies. Furthermore, the presence of significant performance differences across the resource-based groups in this study provides the confirmatory evidence demanded by critics of strategic groups (Barney & Hoskisson, 1990; Ketchen, et al, 1997; Thomas & Venkatraman, 1988) and suggests that these resource-based configurations represent evidence of competitive advantage. Whether these resource-based profiles constitute a generalizable typology that would characterize firms in other industries is open to question. Further work needs to be done to see if resource groups exist in other industries and, if so, what factors differentiate these groups.

Secondly, the results of our investigation provide an alternative perspective on the strategic group concept of competitive advantage and intra-industry competition. While our data show that there are a common resource profiles that categorize firms and their approach to doing business in the nursery industry, the firms in a particular resource-based group do not reside in the same competitive niches as defined by product/market characteristics typically used in strategic group studies. In fact, the data strongly suggest that the degree of overlap between resource-based group membership and product/market-based group membership is minimal – at least in this industry. We see this heterogeneity as theoretically and intuitively consonant with how firms gain and maintain competitive advantage. If a firm is competing in nearly identical markets with nearly identical products as another firm, the first firm

will almost assuredly seek some resource-based strategy that will differentiate itself from its close rival. Conversely, if two firms have very similar resource profiles, and if these resources are crucial to the success of both firms, they would almost necessarily not be positioned in the same market niche. Dissipation of the rent-earning capability of their resource portfolios will occur and failure of one or both firms would follow.

Implications for Research and Practice

The results of our study thus provide interesting implications for the way in which strategy research has viewed firm-level strategy and intra-industry competition. First, while the volume of studies on strategic groups has consistently shown that firms in an industry cluster around a few unique configurations, these are at best incomplete proxies for firm-level strategy. Rather, as the resource-based view of the firm has suggested, firms within these groups likely pursue a strategy based on unique and inimitable resources, and there is a considerable diversity of resource-based strategies within each group.

Furthermore, as the plot of the resource-based groups by product/market-based groups indicates, firm-level strategy appears to be an amalgam of these two sets of factors, and further research should explore the relationships between the two. These findings lend support to Mehra's (1996) suggestions that a firm has two (or more) sets of competitors, existing in different realms and impacting the firm at different points in the value-chain, and the competitive strategies and actions of firms must take into account both sets of competitors in order to build and sustain competitive advantage. The orthogonality of competitive group structures in Figure is also consonant with Chen's (1996) argument that firms rarely have a complete overlap between their "market commonality" and their "resource similarity."

Finally, although current thinking in the field might lead resource-based theorists to focus on the lack of performance differences across product/market groups vis-à-vis the presence of differences across resources groups as evidence that intra-industry competition is best conceptualized in terms of isolating mechanisms that are based on firm-specific characteristics. However, our results suggest exercising caution in this regard. The reliability and robustness of the product/market group solutions, coupled with the supporting evidence provided by self-identified competitors, suggest that Chen (1996) and earlier critics (e.g., Amit & Shoemaker, 1993) were correct in stating that the resource-based view does not adequately consider the external market or industry structure. Inter-firm rivalry appears to be a function of both the firm's positioning with respect to industry structure and its firm-specific resources, as a few studies have suggested (Houthoofd & Heene, 1997; Leask & Parker, 2007; Smith, Grimm, Wally, & Young, 1997).

Limitations

This study, while breaking new methodological and theoretical ground, has several limitations. First of all, absent the existence of definitive measures for defining resource-based groups, our RBV variables should be seen as experimental. In addition, the modest reliabilities of some of those measures suggest that the resource-based competitive group structures should be interpreted with caution. Further research, using these and other variables in a wide range of industries, is needed to explore how robust and generalizable these measures are. Along similar lines, because we used self-reported performance data, and because the data requested were percentages rather than actual numbers, the results from analyses of performance differences across both types of groups should also be viewed with some degree of caution. Ideally, measures such as this should be compared with archival data to check for convergence, but such information was not available in this case. In addition, because all of the variables came from self-reported data, there is the possibility of same-source bias in all of the measures. However, our interactions with industry leaders led us to believe that the combination of the nature of the survey, its academic sponsorship, and prevalent norms in the industry mitigated an excessive degree of self-report bias. Furthermore, with respect to the resource-based groups, by taking the factor means and standardizing them by case, we remove much of the multicollinearity in these data.

Conclusion

In summary, the results here suggest that recent efforts arguing for convergence among alternative methods for forming strategic groups may be overstated or over-emphasized. In fact, by decoupling groupings based on the strategic decisions a firm makes regarding its product-market positioning from groupings based on a firm's employment of certain critical resources and capabilities, strategic management researchers may be able to capture more information about the competitive dynamics in an industry. These results also suggest that in industries where sustainable rents are being earned, one is likely to find significant divergence across various means of forming strategic groups. In contrast, we speculate that those industries wherein product-market positioning is completely convergent with bundles of key resources and capabilities will likely exhibit minimal aggregate profits.

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TABLE 1
DESCRIPTIVE STATISTICS AND CORRELATIONS OF KEY VARIABLES

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1. Acres Sod	48.23	242.02												
2. Acres Field	93.30	185.03	-.048											
3. Acres Containers	7.99	30.20	-.035	.250										
4. Glass Area (sq ft)	3801.67	18312.33	.011	-.055	-.007									
5. Wholesale Channels	2.67	1.78	.178	.368	.252	.247								
6. Retail Channels	1.44	1.38	.070	-.167	-.072	-.065	-.123							
7. Landscape Channels	1.87	1.67	-.056	-.243	-.198	-.114	-.167	.494						
8. Social Complexity	6.17	.93	-.068	.077	.154	.118	-.017	.138	.163	*.916*				
9. Path Dependence	5.04	1.31	.033	.122	.174	.029	.023	.250	.218	.681	*.827*			
10. Marketing	5.45	1.08	-.071	.045	.156	.059	-.007	.170	.083	.504	.472	*.681*		
11. Economics	5.82	.99	-.159	.048	.089	.073	.014	-.082	-.027	.311	.205	.229	*.534*	
12. Physical Assets	5.37	1.31	.058	.183	.140	-.157	-.002	.094	-.075	.361	.474	.229	.257	*.560*

Note: All correlations > .195 are significant at $p < .05$; all correlations > .250 are significant at $p < .01$
Reliabilities (Cronbach's α) for RBV factors are on the diagonal cells and in italics

TABLE 2
PRODUCT/MARKET-BASED STRATEGIC GROUPS FROM CLUSTER ANALYSIS OF SELECTED VARIABLES (GROUP MEANS)

Strategic Group	n	Sod (acres)	Field Stock (acres)	Containers (acres)	Glass Area (sq. ft.)	Wholesale Channels	Retail Channels	Landscape Channels
1	13	50.00	45.69	2.12	3138.46	4.31	2.54	3.46
2	23	.22	16.83	1.51	117.39	1.43	.78	3.39
3	10	.00	330.90	2.10	1200.00	4.70	1.00	1.30
4	35	12.93	54.20	2.29	985.71	2.29	.66	.23
5	15	.07	16.57	1.61	905.33	1.13	3.80	3.33
6	4	.00	280.00	147.50	3000.00	4.75	1.00	.50
7	2	.00	1145.00	35.00	.00	4.00	.50	.00
8	3	.00	14.00	2.00	91666.67	4.67	1.00	1.00
9	3	1366.67	63.33	3.33	6666.67	4.67	2.00	1.33

Descriptions of Strategic Groups:

1: “Jack-of-all-trades”: medium-sized, well-diversified firms, covering broad spectrum of products and services
2: “Small landscapers”: small operations with vast majority of business in landscaping channels
3. “Medium growers”: similar profile to major growers but smaller scale; primarily wholesalers
4: “Mom-and-Pop outfits”: mostly small-town nurseries and Xmas-tree growers; small-scale, narrow scope
5: “Garden centers”: retail-oriented businesses; small-town and suburban garden centers and landscapers
6: “Ground-cover growers”: large wholesale growers of ground-covers and perennials; nation-wide market
7: “Major growers”: large, diversified, multi-site firms; almost exclusively wholesale-focused production
8: “Greenhouse growers”: most of production under glass; primarily wholesale channels
9: “Sod growers”: large-scale sod growing operations; primarily for wholesale distribution

TABLE 3
RESOURCE-BASED STRATEGIC GROUPS FROM CLUSTER ANALYSIS OF RESOURCE FACTORS

	Strategic Group	*n*	*Social Complexity*	*Path Dependence*	*Marketing*	*Economics*	*Physical Assets*
1	"customer/market - focused"	12	6.42	4.82	6.18	5.50	5.13
2	"economics - focused"	24	5.72	4.06	5.49	6.46	5.54
3	"intangibly - focused"	24	6.51	5.36	5.72	5.94	4.04
4	"production - focused"	17	6.00	5.29	4.37	6.26	5.79
5	"physical assets - focused"	18	6.12	5.24	5.22	5.25	6.39
6	"isolated"	9	6.56	5.72	5.81	4.44	5.61

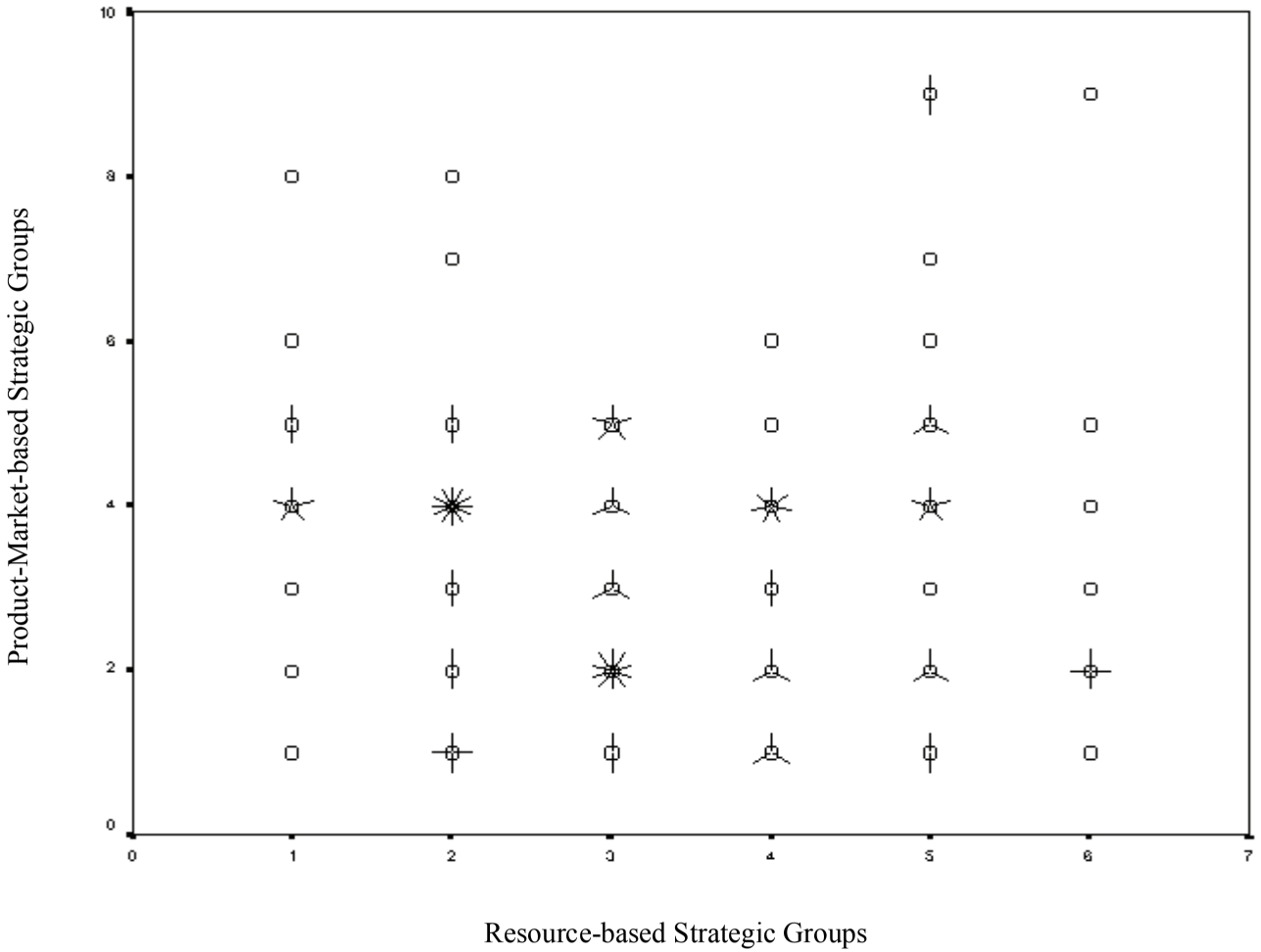
Note: μ and σ represent group factor score mean and standard deviation

TABLE 4
SELF-REPORTED PERFORMANCE MEASURES FOR RESOURCE-BASED STRATEGIC GROUPS

Strategic Group			**Group Means**					
			Δ Sales		*Δ Market share*		*Δ Costs*	
		n	μ	σ	μ	σ	μ	σ
1	"customer/market - focused"	12	6.00	0.85	5.36	1.12	5.33	0.78
2	"economics - focused"	24	4.55	2.17	4.09	1.77	5.29	1.23
3	"intangibly - focused"	24	5.42	1.64	4.73	1.20	4.92	1.25
4	"production - focused"	17	4.01	2.25	3.60	1.55	3.93	1.98
5	"physical assets - focused"	18	4.71	1.79	4.93	1.22	5.47	1.01
6	"isolated"	9	6.25	1.04	5.57	1.13	4.88	0.99

Note: values are group means of self-reported data, measured on a 7-point Likert-type scale, using responses to the questions below

FIGURE 1
COMPARISON PLOT OF PRODUCT-MARKET-BASED VERSUS RESOURCE-BASED STRATEGIC GROUPS



Note: Group memberships from Iterative Partitioning clustering procedures