A MEDIATING EFFECT OF KNOWLEDGE CREATION ON THE RELATIONSHIP BETWEEN SOCIAL CAPITAL AND RESEARCH AND DEVELOPMENT PERFORMANCE IN MALAYSIAN RESEARCH UNIVERSITIES

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First and foremost, I would like to dedicate this thesis to my beloved wife,
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for her sincere love, patience, sacrifice, inspiration, understanding and constant help and encouragement, and my lovely children,

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ABSTRACT

The aim of this study is to understand the influence of social capital (SC) and knowledge creation (KC) activities on research and development (R&D) performance among academic researchers in Malaysian Research Universities (MRU). This research employed a quantitative research design utilizing the survey research method. Three objectives were established and the first is, to formulate a model that identifies the influence of SC and KC on R&D performance in MRU. This was achieved through literature review and preliminary study interviews. Ten researchers from three MRU participated in the interview. Eleven research hypotheses were derived and seven factors, which influenced R&D performance, were identified: the presence of structural, relational and cognitive capital as well as knowledge socialization, externalization, combination and internalization. The second objective is to develop an instrument, which can be used to measure the influence of SC and KC on R&D performance in MRU. This was achieved through systematic literature review and assessment of questionnaires to support the hypotheses and validate the influence model. Data collected was analysed using Cronbach alpha to validate the reliability; while, correlation coefficient and factor analysis were used to check the validity of the instrument. The third objective is to examine the influence of SC on R&D performance in MRU with KC as the mediator. Correlation coefficient was used to test ten hypotheses, while structural equation modelling (SEM) was used to test a hypothesis with KC as the mediator. In addition, multiple regression analysis was utilized to measure the predictive power of the influence model, while SEM was used to evaluate the fitness of the influence model. This study confirms that KC has an indirect mediating influence between SC and R&D performance and also has a stronger influence on R&D performance compared to SC. This study shows that, structural, relational and cognitive social capital is effective in generating tacit knowledge through socialization and internalization activities.

ABSTRAK

Tujuan kajian ini adalah untuk memahami pengaruh modal sosial (SC) dan penciptaan pengetahuan (KC) ke atas prestasi penyelidikan dan pembangunan (R&D) di kalangan penyelidik akademik di Universiti Penyelidikan di Malaysia (MRU). Penyelidikan ini berbentuk kuantitatif menggunakan kaedah kajian tinjauan. Tiga objektif telah dibangunkan dan yang pertama, untuk merangka sebuah model pengaruh SC dan KC ke atas R&D di MRU. Ini dicapai melalui kajian literatur dan temubual awalan. Sepuluh penyelidik dari tiga MRU telah di temubual. Sebelas hipotesis kajian telah dihasilkan dan tujuh faktor yang mempengaruhi prestasi R&D telah dikenal pasti: kehadiran modal struktur, hubungan dan kognitif serta sosialisasi, eksternalisasi, gabungan dan internalisasi pengetahuan. Objektif kedua adalah untuk membangunkan alatan yang boleh digunakan untuk mengukur pengaruh SC dan KC ke atas prestasi R&D di MRU. Ini dicapai melalui kajian literatur bersistematik dan penilaian soal selidik bagi menyokong hipotesis dan mengesahkan model pengaruh. Data dianalisis menggunakan pekali alfa *Cronbach* untuk mengesahkan kebolehpercayaan; manakala pekali korelasi dan analisis faktor untuk menyemak kesahihan instrumen tersebut. Objektif ketiga adalah untuk mengkaji pengaruh SC ke atas prestasi R&D dengan KC sebagai pengantara. Pekali korelasi digunakan untuk menguji sepuluh hipotesis, manakala pemodelan persamaan berstruktur (SEM) digunakan untuk menguji hipotesis dengan KC sebagai pengantara. Sebagai tambahan, analisis regresi berganda digunakan untuk mengukur kuasa ramalan ke atas model berpengaruh manakala SEM digunakan untuk menilai kesesuaian model pengaruh SC dan KC ke atas prestasi R&D di MRU. Kajian ini mengesahkan bahawa KC mempunyai pengaruh perantara tidak langsung antara SC dan prestasi R&D. KC juga mempunyai pengaruh yang lebih kuat ke atas prestasi R&D berbanding dengan SC. Kajian ini menunjukkan bahawa, modal struktur, hubungan dan kognitif adalah sangat berkesan dalam menjana pengetahuan tersirat melalui aktiviti sosialisasi dan internalisasi.

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LIST OF ABBREVIATIONS

HE	Higher Education
HEFCE	Higher Education Funding Council of England
KMO	Keiser-Mayer-Olkin
PIs	Performance Indicator
R&D	Research and Development
RAE	Research Assessment Exercise
UGC	University Grant Commission
UFC	University Funding Council
UoA	Unit of Analysis
VIF	Variance Inflation Factor

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CHAPTER 1

INTRODUCTION

1.1 Overview

This section gives a prologue to the research by portraying a comprehensive picture of the study as a whole and, as such, sets the establishment for the accompanying sections. It begins with an outline of the background of the problem that discusses the broad gaps in the literature of social capital, knowledge production and R&D performance. The following section explains the research questions and objectives followed by the significance of the research and the structure of the thesis.

1.2 Background of the Study

Research is fundamental to the development of knowledge and understanding, and for wealth creation. The university emphasizes research because it naturally complements their primary teaching function. Besides, universities are a critical element for the production and dissemination of knowledge in high-income economies, accelerating the processes of technical advancement and innovation. It reinforces teaching inside universities, supplies a pool of expertise and knowledge on which the economy can elicit, maintains access to wider source of international discovery of research; and it is vital to the preservation of international economic

competitiveness and a cultivated society (HEFCE, 2000). They play a central role, not only as producers of basic research in sciences, technology, arts and humanities but also by creating human capital in the form of higher-skilled workforce.

Nevertheless, university research is experiencing continuous transformation. The cost and scale of conducting research is expanding. Furthermore, the structure of university research and its focus to its enveloping environment is facing a paradigm shift from breakthrough invention to utility (Adams, 2000). Managing university research is becoming increasingly complex, despite additional government funds and assistance. For universities in Malaysia, the management of research activity, particularly those with higher stakes in public research funding, is an increasing significant component in the delivery of the institutional mission, vision and objectives.

In today's competitive surroundings, universities are under continous pressure to innovate to stay ahead of their competition (Henkel, 1999). An approach is to improve the level of R&D outputs and innovation is to ensure that organisational members constantly expand their learning pursuits. At the same time, it is imperative for universities to maximise revenue of their research and to develop new structures and policies to further that end. Their ability to acquire assets for and from the research exercises of their staff are now a significant issue since these assets (staff, financials, equipments, etc) is becoming limited due to competitions with other universities. All types of assets must be managed with maximum accountability and efficiency and harnessed to the requirements of society. The achievement of this objective requires the setting of clear objectives and priorities, the creation of configurations for efficient decision-making, the translucent evaluation of performance and the distribution of resources with reference to that performance.

As part of the Malaysia Higher Institutions' Strategic Plan (PSPTN) of promoting research and innovation, the Malaysia Ministry of Education (MoE) introduced the Malaysia Research Assessment (MyRA) instrument in 2006 (2014).

Similar to the concept of Research Assessment Exercise (RAE) in the UK, MyRA is an instrument utilized to assess the research performance of APEX University, Research Universities (RUs) and Higher Institutions' Centre of Excellence (HICoE). It emphasized on the significance of research, development and commercialization in the national socio-economic development. The main purpose of MyRA instrument is: to evaluate the performance of research and development and commercialization (R&D&C) of local universities; to evaluate applications of Fundamental Research Grant Scheme of universities; to evaluate the application for Research University (RU); and to measure the impact of higher education institutions (HEIs) that was awarded RU status (2014).

RUs in Malaysia play a crucial roles in developing distinguished and effective academic systems, and in making it possible to reach the global knowledge society and participate in advanced knowledge economies. They are extraordinarily important and are consistently enhancing their competitiveness and reputations on the international level. Elsewhere, RUs assumed multifaceted roles in the academic system, including the primary mission of knowledge generation and preparing students to partake in research. RUs are significant to the broader community; much of its research is carried out in partnership, with assistance and support from industry based on government fundings. Currently, RUs in Malaysia are at the pinnacle of the hierarchy in academic system and are essential to the accomplishment of the nation knowledge-oriented economy. Effective 2009, all other universities are also required to self-assess and submit annually their MyRA score to MOHE. MyRA is being used to evaluate the ability of Malaysian higher education institution to perform in R&D activities. MyRA is an instrument that measure R&D competency at institutional level. It provides the excellent indicator by benchmarking three important elements of MyRA instruments are: indicators or criteria; benchmarks of each indicators; and scoring mechanism for each indicators. Malaysia require these institutions to actively engaged in the globalized setting of higher education (HE). Subsequently, understanding the qualities of the RU and developing the structures and the intellectual atmosphere required for high performing RUs is a highest urgency.

1.3 Problem Statement

Previous studies on R&D performance directs to various significant factors that distinguish R&D groups performance (Harvey *et al.*, 2002). Some of these variables, as uncovered in earlier studies (Donow, 1998; Gupta *et al.*, 1999; Harris & Kaine, 1994; Johnston, 1994; Wood, 1990), include inspiring potentials and talent retention, strong management, effective alliances, strategies of related diversification, and effective linked between theory and practice. Cooper and Oatley (1998), explained the procedures involved in the assessment of business and management studies for the RAE in the UK, emphasized that while the research group or department size does not, of itself, seem to be the essential measure for success, achieving a critical mass of researchers with relevant domain knowledge and expertise, shared research interests and goals, network connectedness and collaboration is important in promoting a strong research culture. Investments in social capital are widely believed to improve the organisational performance (Illyas *et al.*, 2009) and Nahapiet and Ghoshal (1998) suggest that differences between firms including differences in performance may represent differences in their ability to create and exploit social capital. Those firms developing particular configurations of social capital are likely to be more successful. Therefore, it is argued that social capital is a necessary enabler of R&D performance in HE.

The term social capital is used to refer to these assets that may be mobilised through belonging to a network and can be defined as the sum of the actual and potential resources (which includes knowledge) embedded within, available through, and derived from networks. Social capital is a inimitable and valuable resource and consequently has the potential to lead to competitive advantage in R&D groups (Bouty, 2000). Social capital that leads to competitive advantage has been claimed to present at the organisational (or collective) level (Castanias & Helfat, 2001). It also has the capability to assist in the formation of distinguish core competencies within R&D groups (Harvey *et al.*, 2002) that can act as resource obstacles, which can then guide to competitive advantage sustainability (Hoelscher *et al.*, 2005).

Social capital can contribute to better management of R&D through an efficient form of collective learning (Kale *et al.*, 2000; Nooteboom, 2000). It can help members of the R&D group learn more quickly because of intensity of interaction within the network. Learning is also of a higher quality where interacting and working with others provide opportunities for knowledge generation through fusion, as a diversity of insights from various actors aid people to reconsider their current premises by observing at the issue from alternate point of view. This procedure of "creative abrasion", in which an actor integrates their tacit knowledge and expertise with others, enables knowledge generation (Press, 2010).

Social capital requires appropriate organisational investments in providing people with space and time to connect, to develop trust, to communicate aims and beliefs effectively, and in offering equitable opportunities and rewards that invite genuine participation, not mere presence. But even when solely individuals who develop ties with one another make social capital investments, numerous actual benefits accrue to the organisation as a whole. Better understanding of the role social capital plays in the performance of R&D is one of the goals of this research.

One of the challenges for the research design of this study is the lack of existing scales to help establish the validity and reliability of an instrument to measure social capital at the individual level. Instruments to explore social capital at national level have been developed and are available from the World Bank (2003). At the time this research is conducted, no equivalent instruments has been readily accessible to study social capital at group level. Although a study by Yli-Renko *et al.* (2001) has been identified to include development of such instrument to measure social capital at individual level, efforts to contact the investigator to learn more about the instrument failed. It was possible to extract some important components from her published article to provide the foundation of a new social capital measuring instrument.

The major assumption underlying all the models on social capital is that investments in social capital will improve the organisational performance. So far, lack of explicit attention has been directed toward the effect of social capital on R&D (Lee *et al.*, 2005) particularly in the HE (Ibbara, 1993; Rodan & Galunic, 2004). Furthermore, limited empirical research exists on how research in the university is organised and what embodies effective organisation in this theme (Harvey *et al.*, 2002). Although researchers have investigated the effect of social capital on innovation (Cooke & Wills, 1999; Florida *et al.*, 2002; Landry *et al.*, 2001), few empirical studies have been done towards the impact of social capital and knowledge creation on the performance of R&D in HE. This study seeks to contribute to filling this gap in existing research.

1.4 Research Question

This research answer the question of:

What is the relationship between social capital and knowledge creation on R&D performance of researchers in research universities in Malaysia?

1.5 Research Objectives

To answer the research question, three objectives were identified:

1. To verify the construct of social capital dimensions represented by structural capital, relational capital and cognitive capital sub-constructs;

2. To develop an instrument that can be used to measure the influence of social capital and knowledge creation on R&D performance of researchers in MRUs; and

3. To examine the influence of social capital on R&D performance of researchers in MRUs with knowledge creation as the mediator.

1.6 Significance of the Study

The notion of social capital has emerged and developed rapidly as a field of study and may have the potential to provide rich and fruitful avenues both for enhancing future research and development performance in the HE sector and for future advances in research into social capital. Researchers have used the concept of social capital to explain different dimensions of human capital that span multiple levels of analysis from organisational learning (Huber, 1991) to a resource-based view of the firm (Barney, 2001). Theoretical advances in this field have forwarded the structural, relational and cognitive dimensions but these have not been equally balanced by sound empirically based studies.

This study aims to provide a better understanding of the concept of social capital and its relationship with knowledge creation activities and R&D performance in the HE sector. An extensive review of the literature and the conduct of pilot research studies enabled appropriate hypotheses to be formulated for the testing and subsequent development of a model of social capital, knowledge creation and R&D performance. Alongside the development of a model, the development of a validated instrument took place to measure social capital and to aid understanding of its constituent constructs, thus allowing the constructs to be examined in a more sophisticated manner than has been possible before. With regards to its methodological importance, this study aimed at the different dimensions of social capital more clearly in order to produce valid and grounded indicators. Such

indicators informed the design and development of an instrument to measure the effect of social capital as well as knowledge creation activities on the performance outcomes of R&D in HE sector.

It is hoped that the evidence provided by this research will serve to encourage HE strategists to harness the true potential of social capital towards effective R&D management. Finally, it is anticipated that this research will provide government officials, academic leaders and managers, and industry partners with an understanding of the areas for organisational improvement to enable knowledge workers to give of their best to enhance R&D performance and contribute to innovation.

1.7 Scope of the Study

1. This study performed an empirical test in the context of Malaysia to investigate the interrelationships among social capital, knowledge creation and performance of R&D in MRUs. The target population, therefore, included academic researchers of five RUs (Universiti Malaya, Universiti Sains Malaysia, Universiti Kebangsaan Malaysia, Universiti Putra Malaysia, and Universiti Teknologi Malaysia) in Malaysia.

2. The academic staffs from five MRUs data were derived from the Statistics of Higher Education of Malaysia 2010 issued by the Ministry of Education (MoE) Malaysia.

1.8 Structure of the Thesis

The structure of this thesis is as follows:

Chapter 1 gives a prologue to the research by portraying a comprehensive picture of the study as a whole and, as such, sets the establishment for the accompanying sections. It begins with an outline of the background of the problem that discusses the broad gaps in the literature of social capital, knowledge production and R&D performance. This section also explains the research questions and objectives followed by the significance of the research, scope of the study and the structure of the thesis.

Chapter 2 examines the literature relating to the concept of social capital including its origins, history and underlying assumptions. It also reviews the existing empirical studies on social capital, and its relationships with R&D performance. The concept of knowledge and its creation were discussed. The descriptions on the building blocks of social science research (ontology, epistemology, methodology and methods) were also provided. Based on the literature review, a proposed influence model of social capital and knowledge creation on R&D performance were formulated. Finally, research hypotheses were derived in this chapter.

Chapter 3 provides the explainations and justifications the research design selected for this study. The procedure of formulating the hypotheses to be tested in the later chapter is also described. Finally the steps of analysing the interview and questionaire data were also discussed.

Chapter 4 provides discussion on data collection that comprise of preliminary interview. Data analyzed from this activity helps in the understanding of the different aspects of the conceptual model for social capital, knowledge creation and R&D performance as well as gaining an appreciation for the language used in MRUs as an

aid to item construction during questionnaire development. This chapter also provides statistical analyses of the data collected from the questionnaire survey. Data analysis includes the process of verifying the validity and reliability of the research instruments and how this validation is perform.

Chapter 5 presents a series analysis on the relationships between the constructs. This chapter also presents the analysis of research hypotheses testing and the evaluation of the proposed model of social capital, knowledge creation and R&D performance.

Finally, chapter 6 considers the major findings of this study and discusses their implications for research and managerial practice.

The next chapter will review the literature on the theory of social capital, knowledge creation and R&D performance. Research hypotheses will be derived and a proposed influence model of social capital and knowledge creation on R&D performance will be formulated.

REFERENCES

Adams, J. (2000). The future of research. In P. Scott (Ed.), *Higher Education Reformed: Shaping the Future* (pp. 196-189). London: Routledge Falmer.

Adler, P. S., & Kwon, S.-W. (2000). Social capital: The good, the bad and the ugly. In E. L. Lesser (Ed.), *Knowledge and social capital: Foundations and applications* (pp. 89-115). Boston: Butterworth-Heinemann.

Ahuja, M. K., Galletta, D. F., & Carley, K. M. (2003). Individual centrality and performance in virtual R&D groups: An empirical study. *Management Science, 49*(1), 21-38.

Anderson, J., & Gerbing, D. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411-423.

Aquino, K., & Serva, M. A. (2005). Using a Dual Role Assessment to Improve Group Dynamics and Performance: The Effects of Facilitating Social Capital in Teams. *Journal of Management Education, 29*(1), 17.

Arrow, K. (1974). *The limits of organization*. New York: Norton.

Ashforth, B. E. (1985). Climate formation: Issues and extensions. *Academy of Management Review, 10*, 837-847.

Bacon, D., Sauer, P., & Young, M. (1995). Composite reliability in structural equations modeling. *Educational and Psychological Measurement, 55*(3), 394-406.

Badaracco, J. L. (1991). *The knowledge link*. Boston, MA: Harvard Business School Press.

Bagozzi, R., & Foxall, G. (1996). Construct validation of a measure of adaptive-innovative cognitive styles in consumption. *International Journal of Research in Marketing, 13*(3), 201-213.

Bagozzi, R., Philips, L., & Yi, Y. (1991). Assessing construct validity in organisational research. *Administrative Science Quarterly, 36*(3), 421-458.

Bagozzii, R. P. (1980). *Causal Models in Marketing*. New York, NY: John Wiley & Sons.

Bailey, K. D. (1994). *Methods in social science*. New York: Free Press.

Ballard, R. (1992). Short forms of the Marlowe-Crowne social desirability scale. *Psychological Reports, 71*, 1155-1160.

Barney, J. B. (2001). Is the resource-based "view" a useful perspective for strategic management research? Yes. *Academy of Management Review, 26*(1), 41-56.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol, 51*(6), 1173-1182.

Beersma, B., Hollenbeck, J. R., Humphrey, S. E., Moon, H., Conlon, D. E., & Ilgen, D. R. (2003). Cooperation, competition, and team performance: Toward a contingency approach. *Academy of Management Journal, 46*(5), 572-590.

Belderbos, R., Carreeb, M., & Lokshin, B. (2004). Cooperative R&D and firm performance. *Research Policy, 33*(10), 1477-1492.

Belliveau, M. A. (2005). Blind Ambition? The Effects of Social Networks and Institutional Sex Composition on the Job Search Outcomes of Elite Coeducational and Women's College Graduates. *Organization Science, 16*(2), 134.

Bence, V., & Oppenheim, C. (2005). The Evolution of the UK's Research Assessment Exercise: Publications, Performance and Perceptions. *Journal of Educational Administration & History, 37*(2), 137-155.

Bernama. (2014). 5 universiti penyelidikan jana RM3.6 bilion pendapatan menerusi R&D - Idris. Retrieved from http://www.bharian.com.my/node/9204 website:

Best, S. J., & Krueger, B. S. (2004). *Internet data collection* (Vol. 141). Thousand Oaks, CA: Sage Publications.

Blaikie, N. (2000). *Designing social research*. Cambridge: Polity.

Boisot, M. (1995). *Information space: A framework for learning in organizations, institutions and culture*. London: Blackwell.

Bosma, N., Praag, M. v., Thurik, R., & Wit, G. d. (2004). The value of human and social capital investments for the business performance of startups. *Small Business Economics, 23*(3), 227-236.

Bourque, L., & Fielder, E. (2003). *How to Conduct Self-Administered and Mail Surveys* (2nd ed.). Thousand Oaks, CA: Sage.

Bouty, I. (2000). Interpersonal and interaction influences on informal resource exchanges between R&D researchers across organizational boundaries. *Academy of Management Journal, 43*(1), 50-65.

Bozeman, B., & Corley, E. (2004). Scientists' collaboration strategies: Implications for scientific and technical human capital. *Research Policy, 33*(4), 599-616.

Bradburn, N. M. (1992). Presidential address: A response to the non-response problem. *Public Opinion Quarterly, 56*, 391-398.

Brass, D. J. (1984). Being in the Right Place: A Structural Analysis of Individual Influence in an Organization. *Administrative Science Quarterly, 29*(4), 518-539.

Bridgeman, B., Lennon, M. L., & Jackenthal, A. (2002). *Effects of screen size, screen resolution, and display rate on computer-based test performance.* Paper presented at the Annual meeting of the National Council on Measurement in Education, New Orleans.

Brinton, M. C. (2000). Social capital in the Japanese youth labor market: Labor market policy, schools, and norms. *Policy Sciences, 33*(3-4), 289-306.

Brown, J. S., & Duguid, P. (1991). Organizational learning and communities of practice: Towards a unified view of working, learning and innovation. *Organization Science, 2*(1), 40-57.

Brown, J. S., & Duguid, P. (2001). Knowledge and organization: A social-practice perspective. *Organization Science, 12*(2), 198-213.

Bryman, A. (2003). *Business research methods*. Oxford: Oxford University Press.

Bryman, A. (2004). *Social research methods* (2nd ed.). Oxford: Oxford University Press.

Bueno, E., Salmador, M. P., & Rodríguez, Ó. (2004). The role of social capital in today's economy: Empirical evidence and proposal of a new model of intellectual capital. *Journal of Intellectual Capital, 5*(4), 556-574.

Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambidge, MA: Harvard University Press.

Burt, R. S. (1997). The contingent value of social capital. *Administrative Science Quarterly, 42*(2), 339-365.

Burt, R. S. (2000). The network structure of social capital. Retrieved 1 March 2003, 2003, from http://gsbwww.uchicago.edu/fac/ronald.burt/research/

Cannon-Bowers, J. A., & Salas, E. (2001). Reflections on shared cognition. *Journal of Organizational Behavior, 22*(2), 195-202.

Cannon-Bowers, J. A., Salas, E., & Converse, S. (1993). Shared mental models in expert team decision making. In N. J. Castellan Jr. (Ed.), *Individual and Group Decision Making: Current Issues* (pp. 221-246): Lawrence Erlbaum Association.

Capon, N., & Farley, J. U. (1993). Organizational climate in U.S. and Australian firms: Amos Tuck School of Business, Dartmouth College.

Capon, N., Farley, J. U., & Hubert, J. M. (1988). *Corporate strategic planning*. New York: Columbia University Press.

Castanias, R. P., & Helfat, C. E. (2001). The managerial rents model: Theory and empirical analysis. *Journal of Management, 27*(6), 661-678.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*(2), 140-161.

Cavana, R., Delahaye, B. L., & Sekaran, U. S. (2001). *Applied Business Research: Qualitative and Quantitative Methods*. Brisbane: John Wiley & Sons Inc.

Chirico, F., & Salvato, C. (2014). Knowledge Internalization and Product Development in Family Firms: When Relational and Affective Factors Matter. *Entrepreneurship Theory and Practice*, n/a-n/a. doi: 10.1111/etap.12114

Chow, W. S., & Chan, L. S. (2008). Social network, social trust and shared goals in organizational knowledge sharing. *Information & Management, 45*(7), 458-465.

Chung, S., Singh, H., & Lee, K. (2000). Complementarity, status similarity and social capital as drivers of alliance formation. *Strategic Management Journal, 21*(1), 1-22.

Churchill, G. A. (2004). *Basic marketing research* (5th ed.). Ohio: South Western Educational Publishing.

Cicourel, A. V. (1973). *Cognitive sociology*. Harmondsworth, UK: Penguin.

Cohen, D., & Prusak, L. (2001). *In good company: How social capital makes organizations work*. Boston, MA: Harvard Business School Press.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, 95-120.

Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, MA: Harvard University Press.

Collins, C., & Clark, K. (2003). Strategic human resource practices, top management team social networks, and firm performance: The role of human resource practices in creating organizational competitive advantage. *Academy of Management Journal, 46*(6), 740-751.

Collins, C. J., & Smith, K. G. (2006). Knowledge exchange and combination: The roles of human resource practices in the performance of high-technology firms. *Academy of Management Journal, 49*(3), 544-560.

Collis, J., & Hussey, R. (2003). *Business research* (2nd Ed. ed.): Palgrave Macmillan.

Cooke, P., & Wills, D. (1999). Small firms, social capital and the enhancement of business performance through innovation programmes. *Small Business Economics, 13*(3), 219-234.

Cooper, C., & Otley, D. (1998). The 1996 research assessment exercise for business and management. *British Journal of Management, 9*(2), 73–89.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

Czaja, R., & Blair, J. (1996). *Designing surveys: A guide to decisions and procedures*. Thousand Oaks, California: Pine Forge Press.

Danchev, A. (2005). Social capital influence on sustainability of development (case study of Bulgaria). *Sustainable development, 13*(1), 25.

Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Boston: Harvard Business School Press.

Davis, D. (2000). *Business Research for Decision Making*. Canada Brooks, Cole: Thomson.

Davis, D. (2004). *Business Research for Decision Making* (6th ed.). CA: Belmont.

Deshpande, R., Farley, J. U., & Jr., F. E. W. (1993). Corporate culture, customer orientation, and innovativeness in Japanese firms: A quadrad analysis. *Journal of Marketing, 57*, 22-57.

Deutsch, M. (1949). A theory of cooperation and competition. *Human Relations, 2*, 129-152.

Dey, E. L. (1997). Working with low survey response rates: The efficacy of weighing adjustments. *Research in Higher Education, 38*, 215-227.

Diamantopolos, A., & Winklhofer, H. (2001). Index construction with formative indicators: an alternative to scale development. *Journal of Marketing Research, 38*(2), 269-277.

Diamantopoulos, A., & Schlegelmilch, B. B. (1997). *Taking the fear out of data analysis*. London: The Dryden Press.

Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method*. New York: John Wiley & Sons, Inc.

Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). New York: John Wiley & Sons, Inc.

Dirks, K. T., & Ferrin, D. L. (2001). The role of trust in organizational settings. *Organization Science, 12*(4), 450-467.

Donow, C. (1998). Competitiveness in academic research. *Knowledge, Technology & Policy, 11*(3), 72-73.

Dyer, J. H. (1996). Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry. *Strategic Management Journal, 17*(4), 271-292.

Dyer, J. H., & Chu, W. (2003). The role of trustworthiness in reducing transaction costs and improving performance: Empirical evidence from the United States, Japan, and Korea. *Organization Science, 14*(1), 57-68.

Dyer, J. H., & Singh, H. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review, 23*(4), 660-679.

Easterby-Smith, M., & Malina, D. (1999). Cross-cultural collaborative research: Towards reflexivity. *Academy of Management Journal, 42*(1), 76-86.

Edelman, L., Bresnen, M., Newell, S., Scarbrough, H., & Swan, J. (2004). The benefits and pitfalls of social capital: Empirical evidence from two organisations in the UK. *British Journal of Management, 15*(S1), 59-69.

Erdem, F., Ozen, J., & Atsan, N. (2003). The relationship between trust and team performance. *Work Study, 52*(7), 337-340.

Filieri, R., & Alguezaui, S. (2014). Structural social capital and innovation. Is knowledge transfer the missing link? *Journal of Knowledge Management, 18*(4), 728-757. doi: doi:10.1108/JKM-08-2013-0329

Filion, J. L. (1989). The magnifying glass principle, or the advantages of doing field research abroad. *Graduate Management Research, 14*, 20-31.

Fischer, H. M., & Pollock, T. G. (2004). Effects of social capital and power on surviving transformational change: The case of initial public offerings. *Academy of Management Journal, 47*(4), 463-481.

Florida, R., Cushing, R., & Gates, G. (2002). When social capital stifles innovation. *Harvard Business Review, 80*(8), 20-.

Florin, J., Lubatkin, M., & Schulze, W. (2003). A social capital model of high-growth ventures. *Academy of Management Journal, 46*(3), 374-384.

Flynn, B., Sakakibara, S, Schroeder, RG, Bates, KA & Flynn, EJ (1990). Empirical research methods in operations management. *Journal of Operations Management, 9*(2), 250-284.

Fraenkel, J. R., & Wallen, N. E. (1993). *How to design and evaluate research in education* (2nd ed.). New York: McGraw Hill.

Fukuyama, F. (1995). *Trust: Social virtues and the creation of prosperity*. London: Hamish Hamilton.

Gabbay, S. M., & Leenders, R. T. A. J. (2001). *Social capital in organizations* (Vol. 18): JAI Press.

Gabbay, S. M., & Zuckerman, E. W. (1998). Social capital and opportunity in corporate R&D: The contingent effect of contact density on mobility expectations. *Social Science Research, 27*(2), 189-217.

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*, 1360-1380.

Granovetter, M. S. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology, 91*(3), 481-510.

Granovetter, M. S. (1992). Problems of explanation in economic sociology. In N. Nohria & R. G. Eccles (Eds.), *Networks and organizations: Structure, form, and action* (pp. 25-56). Boston, MA: Harvard Business School Press.

Grant, R. M. (1996). Toward a Knowledge-Based Theory of the Firm. *Strategic Management Journal, 17*(Winter Special Issue), 109-122.

Green, P. E., Tull, D. S., & Albaum, G. (1988). *Research for Marketing Decisions* (5th ed.). NJ: Prentice Hall.

Grix, J. (2002). Introducing students to the generic terminology of social research. *Politics, 22*(3), 175-186.

Gulati, R. (1995). Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal, 38*, 85-112.

Gupta, A. K., Wilemon, D., & Atuahene-Gima, K. (1999). Excelling in R&D. *Research-Technology Management, 43*(3), 52-58.

Hair Jr, J. F., Black, W. C., & Babin, B. J. (2013). *Multivariate Data Analysis* (7th ed.): Pearson.

Hakansson, H., & Snehota, I. (1995). *Developing relationships in business networks*. London: Routledge.

Hanifan, L. J. (1916). The rural school community center. *Annals of the American Academy of Political and Social Science, 67*, 130-138.

Hansen, M. T. (1998). Combining network centrality and related knowledge: Explaining effective knowledge sharing in multiunit firms. Boston: Harvard Business School.

Hansen, M. T. (2002). Knowledge networks: Explaining effective knowledge sharing in multiunit companies. *Organization Science, 13*(3), 232-248.

Hargadon, A. B. (1998). Firms as knowledge brokers: Lessons in pursuing continuous innovation. *California Management Review, 40*(3), 209-227.

Hargadon, A. B., & Sutton, R. I. (1997). Technology brokering and innovation in a product development frm. *Administrative Science Quarterly, 42*, 716-749.

Harris, G., & Kaine, G. (1994). The determinants of research performance: A study of Australian university economists. *Higher Education, 27*(2), 191-201.

Harvey, J., Pettigrew, A., & Ferlie, E. (2002). The determinants of research group performance: Towards Mode 2? *Journal of Management Studies, 39*(6), 747-774.

Hay, C. (2002). *Political Analysis. A Critical Introduction*. Basingstoke: Palgrave.

Heeseok, L., & Byounggu, C. (2003). Knowledge Management Enablers, Processes, and Organizational Performance: An Integrative View and Empirical Examination. *Journal of Management Information Systems, 20*(1), 179-228.

HEFCE. (2000). Review of research. 00/97. Retrieved 19 Oct 2005, 2005, from http://www.hefce.ac.uk/pubs/hefce/2000/00_37.htm

Henkel, M. (1999). The modernisation of research evaluation: The case of the UK. *Higher Education, 38*(1), 105-122.

Hinton, P. R., Brownlow, C., MacMurray, I., & Cozens, B. (2004). *SPSS explained*. London: Routledge.

Hodson, R. (2005). Management Behaviour as Social Capital: A Systematic Analysis of Organizational Ethnographies. *British Journal of Industrial Relations, 43*(1), 41.

Hoelscher, M. L., Hoffman, J. J., & Dawley, D. (2005). Toward a Social Capital Theory of Competitive Advantage in Medical Groups. *Health Care Management Review, 30*(2), 103.

Hu, L., & Randel, A. E. (2014). Knowledge Sharing in Teams: Social Capital, Extrinsic Incentives, and Team Innovation. *Group & Organization Management*. doi: 10.1177/1059601114520969

Huber, G. P. (1991). Organizational learning: The contribution processes and the literature. *Organization Science, 2*(1), 88-115.

Huff, L., & Kelley, L. (2003). Levels of organizational trust in individualist versus collectivist societies: A seven-nation study. *Organization Science, 14*(1), 81-90.

Hughes, J., & Sharrock, W. (1997). *The Philosophy of Social Research* (3rd Ed. ed.). London: Longman.

Ibbara, I. (1993). Network centrality, power, and innovation involvement. Determinants of technical and administrative roles. *Academy of Management Journal, 36*, 471-501.

Illyas, M. I., Alias, R. A., & Damodaran, L. (2009). *Intellectual capital and performance: An empirical study on the relationship between social capital and R&D performance in higher education*. Paper presented at the The 6th International Conference on Knowledge Management, Hong Kong.

Inkpen, A. C. (1994). The characteristics and performance of Japanese-North American joint ventures in North America. In S. B. Prasad & R. B. Peterson (Eds.), *Advances in International Comparative Management* (Vol. 9, pp. 83-108). Greenwich, CT: JAI Press.

Inkpen, A. C., & Tsang, E. W. K. (2005). Social capital, networks, and knowledge transfer. *Academy of Management Review, 30*(1), 146-165.

Jacobs, J. (1961). *The decline and rise of American cities*. New York: Random House.

Jacobs, J. (1965). *The death and life of great American cities*. London: Penguin Books.

Janhonen, M., & Johanson, J.-E. (2011). Role of knowledge conversion and social networks in team performance. *International Journal of Information Management, 31*(3), 217-225. doi: http://dx.doi.org/10.1016/j.ijinfomgt.2010.06.007

Janz, B. D., Colquitt, J. A., & Noe, R. A. (1997). Knowledge worker team effectiveness: The role of autonomy, interdependence, team development, and contextual support variables. *Personnel Psychology, 50*(4), 877-904.

Jashapara, A. (2003). Cognition, culture and competition: An empirical test of the learning organization. *The Learning Organization, 10*(1), 31-50.

Johnston, R. (1994). Effects of resource concentration on research performance. *Higher Education, 28*(1), 25-37.

Jones, O. (2005). Manufacturing regeneration through corporate entrepreneurship: Middle managers and organizational innovation. *International Journal of Operations & Production Management, 25*(5), 491-511.

Joreskog, K., & Sorbom, D. (1996). *LISREL 8: User's Reference Guide*. Chicago, IL: Scientific Software International.

Kaiser, H. K. (1970). A second generation Little Jiffy. *Psychometrika, 35*, 401-415.

Kaiser, H. K. (1974). An index of factorial simplicity. *Psychometrika, 39*, 31-36.

Kale, P., Singh, H., & Perlmutter, H. (2000). Learning and protection of proprietary assets in strategic alliances: Building relational capital. *Strategic Management Journal, 21*(3), 217-237.

Kankanhalli, A., Tan, B. C. Y., & Wei, K.-K. (2005). Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation 1. *MIS Quarterly, 29*(1), 113.

Kavanaugh, A. L., Reese, D. D., Carroll, J. M., & Rosson, M. B. (2005). Weak Ties in Networked Communities. *Information Society, 21*(2), 119.

Klassen, R. D., & Jacobs, J. (2001). Experimental comparison of Web, electronic and mail survey technologies in operations management. *Journal of Operations Management, 19*(6), 713-728.

Klimoski, R. J., & Mohammed, S. (1994). Team mental model: Construct or methaphor? *Journal of Management, 20*, 403-437.

Klimstra, P. D., & Potts, J. (1988). What we've learned managing R&D projects. *Research Technology Management, 31*(3), 23-39.

Koka, B. R., & Prescott, J. E. (2002). Strategic alliances as social capital: A multidimensional view. *Strategic Management Journal, 23*(9), 795-816.

Krackhardt, D. (1989). *Graph theoretical dimensions of informal organization.* Paper presented at the Annual meeting of the Academy of Management, Washington, DC.

Krishna, A. (2004). Understanding, measuring and utilizing social capital: clarifying concepts and presenting a field application from India. *Agricultural Systems, 82*(3), 291-305.

Kuhnert, K., & McCauley, D. P. (1996). Applying alternative survey methods. In A. I. Kraut (Ed.), *Organisational surveys: Tools for assessment and change* (pp. 233-254). San Francisco, CA: Jossey Bass.

Kumar, R. (1996). *Research methodology: A step-by-step guide for beginners*. London: Sage Publications.

Kvale, S. (2007). *Doing interviews*. London: Sage Publication Ltd.

Landry, R., Amara, N., & Lamari, M. (2001). Social capital, innovation and public policy. *ISUMA: Canadian Journal of Policy Research, 2*(1), 73-79.

Larson, A. (1992). Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Science Quarterly, 37*, 76-104.

Law, S. P.-M., & Chang, M. K. (2008). *Fostering Knowledge Exchange in Online Communities: A Social Capital Building Approach.* Paper presented at the The 29th International Conference on Information Systems.

Lee, S. H., Wong, P. K., & Chong, C. L. (2005). Human and social capital explanations for R&D outcomes. *IEEE Transactions on Engineering Management, 52*(1), 59-68.

Leeuw, E. d., & Heer, W. d. (2002). Trends in household survey non response: A longitudinal and international comparison. In R. M. Groves, D. A. Dillman, J. L. Eltinge & R. J. A. Little (Eds.), *Survey nonresponse* (pp. 41-54). New York: John Wiley & Sons, Inc.

Lei, P.-W., & Wu, Q. (2007). Introduction to Structural Equation Modeling: Issues and Practical Considerations. *Educational Measurement: Issues and Practice, 26*(3), 33-43. doi: 10.1111/j.1745-3992.2007.00099.x

Lesser, E. L. (2000). *Knowledge and social capital: Foundations and applications*. Boston: Butterworth-Heinemann.

Lesser, E. L., & Prusak, L. (1999). Communities of practice, social capital and organizational knowledge (pp. 10). Cambridge, MA: Institute of Knowledge Management, International Business Machine (IBM).

Levesque, L. L., Wilson, J. M., & Wholey, D. R. (2001). Cognitive divergence and shared mental models in software development project teams. *Journal of Organizational Behavior, 22*(2), 135-144.

Levin, D. Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science, 50*(11), 1477.

Lin, N., Cook, K., & Burt, R. S. (2001). *Social capital: Theory and research*: Aldine de Gruyter.

Lin, S.-C., & Huang, Y.-M. (2005). The role of social capital in the relationship between human capital and career mobility: Moderator or mediator? *Journal of Intellectual Capital, 6*(2), 191-205.

Litwin, M. S. (2003). *How to assess and interpret survey psychometrics* (2nd ed. Vol. 7). Thousand Oaks, CA: Sage Publications.

Llewellyn, N., & Armistead, C. (2000). Business process management: Exploring social capital within processes. *International Journal of Service Industry Management, 11*(3), 225-243.

Locke, E. A., & Latham, G. P. (1984). *Goal setting: A motivational technique that works*. Englewood Cliffs, NJ: Prentice-Hall.

Loury, G. C. (1977). A dynamic theory of social income differences. In P. A. Wallace & A. M. LeMonde (Eds.), *Women, minorities, and employment discrimination* (pp. 153-186). Lexington, MA: Lexington Books.

Loury, G. C. (1987). Why should we care about group inequality? *Social Philosophy and Policy, 5*(1), 249-271.

Luecke, R., & Katz, R. (2003). *Managing Creativity and Innovation*. Boston, MA: Harvard Business School Press.

Lynn, G. S., Reilly, R. R., & Akgun, A. E. (2000). Knowledge management in new product teams: Practices and outcomes. *IEEE Transactions on Engineering Management, 47*(2), 221-231.

Maccallum, R. C., & Browne, M. W. (1993). The Use of Causal Indicators in Covariance Structure Models - Some Practical Issues. *Psychological Bulletin, 114*(3), 533-541. doi: Doi 10.1037/0033-2909.114.3.533

Madhok, A. (1995). Opportunism and trust in joint venture relationships: An exploratory study and a model. *Scandinavian Journal of Management, 11*(1), 57-74.

Malhotra, N. K. (2009). *Marketing Research: An Applied Orientation* (6th ed.). Upper Saddle River, NJ: Prentice Hall.

Mauss, M. (1954). *The gift*. New York: Free Press.

McComb, S. A., Green, S. G., & Compton, W. D. (1999). Project goals, team performance, and shared understanding. *Engineering Management Journal, 11*, 7-12.

McFadyen, M. A., & Cannella, A. A. (2004). Social capital and knowledge creation: Diminishing returns of the number and strength of exchange relationships. *Academy of Management Journal, 47*(5), 735-746.

Melin, G. (2000). Pragmatism and self-organization - Research collaboration on the individual level. *Research Policy, 29*(1), 31-40.

Merton, R. K. (1968). *Social theory and social structure*. New York: Free Press.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2nd Ed ed.): SAGE Publications.

Minogue, K. (1986). Political science and the gross intellectual product. *Government and Opposition, 21*(4), 185-194.

Mintzberg, H. (1991). The effective organization: Forces and forms. *Sloan Management Review*(Winter), 54-67.

Mohr, J., & Spekman, R. (1994). Characteristics of partnership success. *Strategic Management Journal, 15*(2), 135-152.

Monteverde, K. (1995). Applying resource-based strategic analysis: Making the model more accessible to practitioners. Philadelphia: Department of Management and Information Systems, St. Joseph's University.

Moore, S., Shiell, A., Hawe, P., & Haines, V. A. (2005). The Privileging of Communitarian Ideas: Citation Practices and the Translation of Social Capital Into Public Health Research. *American Journal of Public Health, 95*(8), 1330.

Moran, P., & Ghoshal, S. (1999). Markets, firms, and the process of economic development. *Academy of Management Review, 24*(3), 390-412.

Morrison, E. W. (2002). Newcomer's relationships: The role of social network ties during socialization. *Academy of Management Journal, 45*(6), 1149-1160.

Mumford, M. D. (2002). Social innovation: Ten cases from Benjamin Franklin. *Creativity Research Journal, 14*, 253-266.

Murray, F. (2004). The role of academic inventors in entrepreneurial firms: Sharing the laboratory life. *Research Policy, 33*(4), 643-659.

Myers, S., & Marquis, D. G. (1969). Successful industrial innovation: A study of factors underlying innovation in selected firms. Washington, DC: Nationl Science Foundation.

Myint, Y. M., Vyakarnam, S., & New, M. J. (2005). The effect of social capital in new venture creation: The Cambridge high-technology cluster. *Strategic Change, 14*(3), 165.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review, 23*(2), 242-266.

Nahapiet, J., Gratton, L., & Rocha, H. O. (2005). Knowledge and relationships: when cooperation is the norm. *European Management Review, 2*(1), 3-14. doi: 10.1057/palgrave.emr.1500023

Neuman, W. L. (2006). *Social Research Methods: Qualitative and Quantitative Approaches* (5th Ed ed.). Boston: Sage.

Newell, S., & Swan, J. (2000). Trust and interorganizational networking. *Human Relations, 53*(10), 1287-1328.

Newell, S., Tansley, C., & Huang, J. (2004). Social capital and knowledge integration in an ERP project team: The importance of bridging and bonding. *British Journal of Management, 15*(S1), S43-S57.

Nielsen, J. (2000). *Designing web usability: The practice of simplicity*. Indianapolis, IN: New Riders.

Nohria, N., & Eccles, R. G. (1992). *Networks and organizations: Structure, form, and action*. Boston, MA: Harvard Business School Press.

Nonaka, I. (1998). The knowledge creating company *Harvard Business Review on Knowledge Management* (pp. 21-45). Boston: Harvard Business School Press.

Nonaka, I., Byosiere, P., Borucki, C. C., & Konno, N. (1994). Organisational knowledge creation theory: A first comprehensive test. *International Business Review, 3*(4), 337–351.

Nonaka, I., & Takeuchi, K. (1995). *The knowledge creating company: How Japanese companies cretae the dynamics of innovation*. Oxford: University Press, Oxford.

Nonaka, I., Toyama, R., & Konno, N. (2000). SECI, ba and leadership: A unified model of dynamic knowledge creation. *Long Range Planning, 33*(1), 5-34.

Nonaka, I., Umemoto, K., & Senoo, D. (1996). From information processing to knowledge creation: A Paradigm shift in business management. *Technology in Society, 18*(2), 203-218. doi: http://dx.doi.org/10.1016/0160-791X(96)00001-2

Nooteboom, B. (2000). Learning by interaction: Absorptive capacity, cognitive distance and governance. *Journal of Management and Governance, 4*(1-2), 69-92.

Norusis, M. J. (2000). *SPSS: Regression Models 10.0*. Upper Saddle River, N.J: Prentice Hall.

Nunnally, J. C. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

O'Brien, P. K. (1994). Research selectivity exercises: A sceptical but positive note. *Higher Education Review, 26*(3), 7-17.

OECD. (1994). Main definitions and convention for the measurement of research and experimental development (R&D): A summary of the Frascati Manual 1993 (pp. 30). Paris: Organisation for Economic Co-operation and Development (OECD).

Oh, H., Chung, M.-H., & Labianca, G. (2004). Group Social Capital and Group Effectiveness: The Role of Informal Socializing Ties. *Academy of Management Journal, 47*(6), 860.

Orr, J. (1990). Sharing knowledge, celebrating identity: Community memory in a service culture. In D. Middleton & D. Edwards (Eds.), *Collective remembering* (pp. 169-189). London: Sage Publications.

Oyen, E. (1990). *Comparative methodology: Theory and practice in international social research*. London: Sage Publications.

Pallant, J. (2005). *SPSS survival manual: A step-by-step guide to data analysis using SPSS for Windows (Version 12)* (2nd ed.). Berkshire: Open University Press.

Pan, S. L., & Scarbrough, H. (1999). Knowledge Management in Practice: An Exploratory Case Study. *Technology Analysis and Strategic Management, 11*(3), 359-374.

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (Vol. 1, pp. 17-59). San Diego, CA.: Academic Press Inc.

Paulhus, D. L., & Martin, C. L. (1988). Functional flexibility: A new conception of interpersonal flexibility. *J Pers Soc Psychol, 50*(1), 88-101.

Peng, M. W., & Luo, Y. (2000). Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Academy of Management Journal, 43*(3), 486-501.

Pettigrew, A., & Whittington, R. (2000). The new internal network organization: Process and performance. London: ESRC.

Phillimore, A. J. (1989). University research performance indicators in practice: The University Grants Committee's evaluation of British universities, 1985–86. *Research Policy, 18*(5), 255-271.

Polanyi, M. (1967). *The tacit dimension*. London: Routledge.

Politis, J. D. (2003). The connection between trust and knowledge management: What are its implications for team performance. *Journal of Knowledge Management, 7*(5), 55-66.

Pollack, C. E., & Knesebeck, O. v. d. (2004). Social capital and health among the aged: comparisons between the United States and Germany. *Health & Place, 10*(4), 383-391.

Putnam, R. (1993a). *Making democracy work: Civic traditions in modern Italy*. Princeton, New Jersey: Princeton University Press.

Putnam, R. (1993b). The prosperous community: Social capital and public life. *American Prospect, 13*, 35-42.

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy, 6*(1), 65-78.

Quinn, R. E. (1988). *Beyond rational management*. San Francisco, CA: Jossey Bass.

Raykov, T., & Widaman, K. F. (1995). Issues in Applied Structural Equation Modeling Research. *Structural Equation Modeling-a Multidisciplinary Journal, 2*(4), 289-318. doi: Doi 10.1080/10705519509540017

Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effect of cohesion and range. *Administrative Science Quarterly, 48*(2), 240-267.

Reagans, R., & Zuckerman, E. W. (2001). Networks, diversity, and productivity: The social capital of corporate R&D teams. *Organization Science, 12*(4), 502-517.

Reich, B. H., & Kaarst-Brown, M. L. (2003). Creating social and intellectual capital through IT career transitions. *Journal of Strategic Information Systems, 12*(2), 91-109.

Robinson, J. P., Shaver, P. R., & Wrightman, L. S. (1990). Criteria for scale selection and evaluation. In J. P. Robinson, P. R. Shaver & L. S. Wrightman (Eds.), *Measures of personality and psychological attitudes*. San Diego, CA: The Academic Press.

Rodan, S., & Galunic, C. (2004). More than network structure: How knowledge heterogeneity influences managerial performance and innovativeness. *Strategic Management Journal, 25*(6), 541-562.

Roth, J. (2003). Enabling knowledge creation: Learning from an R&D organization. *Journal of Knowledge Management, 7*(1), 32-48.

Rothschild, L., & Darr, A. (2005). Technological incubators and the social construction of innovation networks: An Israeli case study. *Technovation, 25*(1), 59.

Rouse, W. B., Cannon-Bowers, J. A., & Salas, E. (1992). The role of mental models in team performance in complex systems. *IEEE Transactions on Systems, Man, and Cybernetics, 22*(6), 1296-1308.

Rowley, T., Behrens, D., & Krackhardt, D. (2000). Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management Journal, 21*(3), 369-389.

Rynes, S. L., Bartunek, J. M., & Daft, R. L. (2001). Across the great divide: Knowledge creation and transfer between practitioners and academics. *Academy of Management Journal, 44*(2), 340-355.

Sandefur, R., & Laumann, E. O. (1998). A paradigm for social capital. *Rationality and Society, 10*(4), 484.

Sax, L. J., Gilmartin, S. K., & Bryant, A. N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education, 44*(4), 409-432.

Scott, J. (2000). *Social network analysis: A handbook* (2nd ed.). London: Sage Publications.

Seibert, S. E., Kraimer, M. L., & Liden, R. C. (2001). A social capital theory of career success. *Academy of Management Journal, 44*(2), 219-237.

Shane, S. C., D. (2002). Network Ties, Reputation, and the Financing of New Ventures. *Management Science, 48*(3), 364-381.

Shaw, J. D., Duffy, M. K., Johnson, J. L., & Lockhart, D. E. (2005). Turnover, Social Capital Losses, and Performance. *Academy of Management Journal, 48*(4), 594.

Sheehan, K. (2001). E-mail survey response rates: A review. *Journal of Computer-Mediated Communication, 6*(2).

Smith, T. (1995). Trends in nonresponse rates. *International Journal of Public Opinion Research, 7*, 157-171.

Soda, G., Usai, A., & Zaheer, A. (2004). Network memory: The influence of past and current networks on performance. *Academy of Management Journal, 47*(6), 893-906.

Starbuck, E. (2001). Optimizing university research collaborations. *Research-Technology Management, 44*(1), 40-44.

Stevenson, W. B., & Greenberg, D. (2000). Agency and social networks: Strategies of action in a social structure of position, opposition, and opportunity. *Administrative Science Quarterly, 45*(4), 651-678.

Subramaniam, M., & Youndt, M. A. (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities. *Academy of Management Journal, 48*(3), 450.

Teagarden, M. B., Von Glinow, M. A., Bowen, D. E., Frayne, C. A., Nason, S., Huo, Y. P., . . . Drost, E. A. (1995). Towards a theory of comparative management research: an idiographic case study of the best international human resources management project. *Academy of Management Journal, 38*(5), 1261-1287.

The World Bank. (2003). What is social capital? Retrieved 18 April 2003, 2003, from http://www.worldbank.org/poverty/scapital/whatsc.htm

Thompson, J. A. (2005). Proactive Personality and Job Performance: A Social Capital Perspective. *Journal of Applied Psychology, 90*(5), 1011.

Tichy, N. M., Tushman, M. L., & Fombrun, C. (1979). Social network analysis for organization. *Academy of Management Review, 4*, 507-519.

Tiler, C., & Boddington, A. (1991). Evaluation for industry, economy and employment group of the ESRC: The Centre for Urban and Regional Development Studies.

Trochim, W. M. (2006). *The Research Methods Knowledge Base* (3rd ed.): Atomic Dog Publishing Inc.

Trott, P. (2005). *Innovation Management and New Product Development* (3rd ed.). Essex: Pearson Eductaion Ltd.

Try, S. (2005). The use of job search strategies among university graduates. *Journal of Socio-Economics, 34*(2), 223.

Tsai, M.-T., & Li, Y.-H. (2007). Knowledge creation process in new venture strategy and performance. *Journal of Business Research, 60*(4), 371-381. doi: http://dx.doi.org/10.1016/j.jbusres.2006.10.003

Tsai, W. (2000). Social capital, strategic relatedness and the formation of interorganizational linkages. *Strategic Management Journal, 21*(9), 925-939.

Tsai, W. (2001). Knowledge transfer in intraorganizational networks: Effects of network position and absorptive capacity on business unit innovation. *Academy of Management Journal, 44*(5), 996-1004.

Tsai, W. (2002). Social structure of "Coopetition" within a multiunit organization: Coordination, competition, and intra-organizational knowledge sharing. *Organization Science, 13*(2), 179–190.

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: An empirical study of intra-firm networks. *Academy of Management Journal, 41*(4), 464-476.

Tseng, S. M. (2010). The correlation between organizational culture and knowledge conversion on corporate performance. *Journal of Knowledge Management, 14*(2), 269-284. doi: 10.1108/13673271011032409

Tull, D. S., & Hawkins, D. I. (1993). *Marketing research: Measurement and method - A text with cases* (6th ed.). New Jersey: Prentice Hall.

Twiss, B. (1992). *Managing Technological Innovation* (4th ed.). London: Financial Times Pitman.

Uzzi, B. (1997). Social structure and competition in inter-firm networks: The paradox of embeddedness. *Administrative Science Quarterly, 42*, 35-67.

Uzzi, B. (2002). Knowledge spillover in corporate financing networks: Embeddedness and the firm's debt performance. *Strategic Management Journal, 23*, 595-618.

Vaus, D. d. (2002). *Surveys in Social Research* (5th ed.). London: Routledge.

Wasko, M. M., & Faraj, S. (2005). Why should I share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice 1. *MIS Quarterly, 29*(1), 35.

Wasserman, S., & Faust, K. (1994). *Social network analysis*. Cambridge: Cambridge University Press.

Watson, G. W., & Papamarcos, S. D. (2002). Social capital and organizational commitment. *Journal of Business and Psychology, 16*(4), 537-552.

Westphal, J. D., Boivie, S., & Chng, D. H. M. (2006). The Strategic Impetus for Social Network Ties: Reconstituting Broken CEO Friendship Ties. *Strategic Management Journal, 27*(5), 425-445.

Wipawayangkool, K., & Teng, J. T. C. (2014). Paths to tacit knowledge sharing: knowledge internalization and individual-task-technology fit. *Knowl Manage Res Prac*. doi: 10.1057/kmrp.2014.33

Wood, F. (1990). Factors influencing research performance of university academic staff. *Higher Education, 19*(1), 81-100.

Woolcock, M. (1998). Social capital and economic development: Towards a theoretical synthesis and policy framework. *Theory and Society, 27*(2), 151-208.

Wu, W.-Y., & Tsai, H.-J. (2005). Impact of social capital and business operation mode on intellectual capital and knowledge management. *International Journal of Technology Management, 30*(1,2), 147.

Yli-Renko, H., Autio, E., & Sapienza, H. J. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. *Strategic Management Journal, 22*(6-7), 587-613.

Youndt, M. A., Subramaniam, M., & Snell, S. A. (2004). Intellectual capital profiles: An examination of investments and returns. *Journal of Management Studies, 41*(2), 335-361.

Young, C.-S. (2005). Top management teams' social capital in Taiwan: The impact on firm value in an emerging economy. *Journal of Intellectual Capital, 6*(2), 177-190.

Zaheer, A., McEvily, B., & Perrone, V. (1998). Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organization Science, 9*(2), 141-159.

Zikmund, W. (2000). *Business Research Methods*. Fort Worth: Dryden.

Zikmund, W., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business Research Methods*. Mason, OH: South-Western.