

THE IMPACT OF AGE ON KNOWLEDGE DIFFUSION DYNAMICS

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การที่ประชากรในประเทศต่าง ๆ มีอายุเฉลี่ยเพิ่มสูงขึ้น อาจทำให้ต้องมีการพิจารณาองค์ประกอบของแรงงานกันใหม่ งานวิจัยด้านการเผยแพร่ความรู้ (Knowledge diffusion) ยังขาดการศึกษา ปัจจัยด้านอายุงานวิจัยนี้ ศึกษาแนวคิดในเรื่องการเผยแพร่ความรู้และศึกษาความแตกต่างระหว่างประชาชนที่มีอายุต่างกันในด้านพฤติกรรมการเผยแพร่ความรู้ ประชากรที่ใช้ในการศึกษา คือ ผู้อยู่ในระบบขายตรง (MLM) เนื่องจากระบบขายตรงมีขอบเขตของความรู้ที่ชัดเจน อายุของกลุ่มตัวอย่างอยู่ระหว่าง 17 - 75 ปี ผลการวิจัยพบว่า กลุ่มตัวอย่างที่อายุต่างกัน มีพฤติกรรมในการเผยแพร่ความรู้แตกต่างกันเพียงเล็กน้อย

Abstract

Growing aging indices in many countries might create reconsideration of the work force distribution. In knowledge diffusion research there are very limited studies done in group comparisons especially on the age factor. This study constructs a knowledge diffusion framework and used it to evaluate age differences among age stages. The study used multilevel marketing (MLM) active agents as the context for its constrained knowledge scope and the similarity among MLMs. The age distribution of respondents ranged between 17 and 75. The findings revealed that respondents in different age stages showed no major differences in overall knowledge diffusion behaviors except for some subtle differences.

INTRODUCTION

The growing proportion of senior citizens is an emerging concern for future human resources (Gavrilov & Heuveline, 2003) and there is a common perception that age and working capability are related. Managers perceive that 40 is the downhill age (Kreps, 1977). However the relationship between mental capability and the population age from 40 to the retiring age of 65 remains ambiguous. Using knowledge diffusion as the foundation of human capital developments (Gettier, 1966), this study aims to find out whether there are age differences in knowledge diffusion performance and uses the findings as the reference to adjust the perception of age factor for future human resource planning.

The study discusses previous research and theories, uses the arguments to construct a knowledge diffusion path diagram, and performs a multigroup

analysis among age stages. The targeted population is the multilevel marketing businesses (MLMs) in Thailand for the similarity in the business practices among MLMs.

REVIEW OF THE LITERATURE

Knowledge Diffusion

Diffusion is a phenomenon of a mass from higher concentration milieu to the lower concentration milieu (Graham, 1852). The knowledge diffusion occurs when there are imbalances between the technical dimensions that seek an equilibrium determined by changes in the economic attributes (Dosi, 1988). Successful knowledge diffusion depends on how precisely the original knowledge is to be copied, replicated, imitated and reproduced.

Determinants Related to Knowledge Diffusion

Source capability includes disseminative capability, experience and expertise. Disseminative capability is the ability to construct a meaningful description about the knowledge, which includes the support or willingness to share the knowledge (Feder & Slade, 1985; William, 2007; Minbaeva, 2007). According to Shannon (1948), the source's ability to well codify and transfer knowledge is needed for recipients to decode and adopt the knowledge. Disseminative capability improves knowledge diffusion (Minbaeva, 2007). Recipient's perceived supportiveness reduces the stress on approaching knowledge source and increases the level of dissemination and facilitates knowledge diffusion (Nucholls, Callell, & Kaplin, 1972). Experience increases tacit knowledge (Nelson & Winter, 1982; Berman, Down & Hill, 2002), reduces knowledge ambiguity and makes it easier to be transferred (Simonin, 1999). Expertise is the know-how, proficiency and skills. The theory of source credibility (Hovland & Weiss, 1951) and social learning theory (Bandura, 1977) posited that recipients are more likely to acquire knowledge from creditable sources whom they perceived as having expertise. Based on the discussion, the following relationship is constructed:

Source capability has positive impact on knowledge diffusion.

Recipient capability includes absorptive capability and recipient expertise. Absorptive capability is the ability to assimilate the knowledge learned or the perceived easiness of absorption (Cohen & Levinthal, 1990), or the prior knowledge and the willingness on adopting of new knowledge (Minbaeva, 2007). The simplest codified knowledge requires a sufficient absorptive capability to understand (Shariq, 1999). The efficiency of knowledge diffusion depends on the recipient's ability to add new knowledge to existing knowledge (Grant, 1996). Absorptive capability improves knowledge diffusion (Doring & Schnellenbach, 2006; Minbaeva, 2007; Simonin, 2004; Szulanski, 1996; Williams, 2007). Recipient expertise is a subjective view on the recipient's overall competence (Minbaeva, 2007),

which posited a similar definition as absorptive capability. Thus, the following relationship is constructed:

Recipient capability has positive relationship on knowledge diffusion.

Knowledge gap, knowledge distance, or knowledge interval (Morone & Taylor, 2004) possesses a similar meaning, "... is the gap between what we should know ... and what we really know at a given point in time". (Regev, Shtub, & Ben-Haim, 2006, p: 17).

A knowledge gap exhibits influences in knowledge diffusion by affecting the level of adoption and understanding about the knowledge transferred and the speed of transfer (Morone & Taylor, 2004). However, the finding was inconsistent with social comparison theory (Hornstein, Fisch & Holmes, 1968) which argues that people comparing themselves with others and believing in themselves should have similarity with others, which creates motivation to close the gap. Additionally, Gupta and Govindarajan (2000) posited that the wider the knowledge gap the greater the knowledge is transferred. Thus, the following relationship is constructed:

Knowledge gap affects the knowledge diffusion.

Social Context

"...neglecting context is the greatest single disaster which philosophic thinking can incur" (Dewey, 1998, p: 211). Context includes the structure, process and reality (Barnett & Casper, 2001). Structure refers to the tie strength and path length and, process refers to the interplay or socialization mechanism (Earle & Earle, 1999). Reality refers to culture and language (Searle, 1995).

Tie strength. Tie strength is how close or intimate and how often an interaction between a people takes place (Cross & Sproull, 2004; Granovetter, 1973; Hansen, 1999; Levin & Cross, 2004; Marsden & Cambell, 1984; Reagans & McEvily, 2003). Tie strength supports the receiving of knowledge in various ways. Granovetter (1973) argued that implicit knowledge can be better transferred

through strong ties, while explicit coded knowledge favors weak ties. Murray & Peyrefitte (2007) cited Strang and Soule's (1998) argument, that relationships between knowledge sources and recipients are an important determinant of knowledge diffusion. Reagans and McEvily (2003) posited that stronger ties improve knowledge diffusion. Thus, the following relationship is constructed:

Stronger tie strength improves level of knowledge diffusion.

Path length has been defined as the social distance between the source and the recipient (Morone and Taylor, 2004). Mixed relationships were found between path length and knowledge diffusion. Reagans and McEvily (2003) argued that network range improve knowledge transfer from a source to a recipient while Morone and Taylor (2004) gave a negative argument. Positive relationship was found in external consultancy activities (Lee & Allen, 1982). An inverted U shape was found between path length and knowledge diffusion of patents (Miller, et al., 2007). Thus:

There is a relationship between path length and the knowledge diffusion.

Socialization mechanism is "*The process by which an individual acquires the social knowledge and skills necessary to assume an organizational role*" (Van Maanen & Schein, 1979, p. 211). It is the process of learning what is expected (King & Sethi, 1998), the exchanging of ideas, beliefs, visions, and gaining cultural consensus among members within a social network (Björkman, et al., 2004). It is an on-going activity (Baker & Feldman, 1991; Klein & Weaver, 2000; Taormina, 2004) as explained in the process of knowledge spiral, socialization-externalization-combination-internalization (SECI) (Nonaka & Takeuchi, 1995). Gupta & Govindarajan (2000) separated socialization mechanism into vertical and lateral mechanism. Training courses, standardized training materials (Pratt, 2000), and coaching activities (Msweli-Mbanga, 2001; Pratt, 2000; Pratt & Rosa, 2003) are categorized as vertical socialization. Conferences or seminars for experience sharing, (Bhattacharya & Mehta, 2000;

Croft & Woodruffe, 1996; Msweli-Mbanga, 2001) and home party (Msweli-Mbanga, 2001; Pratt, 2000) can be categorized as the lateral socialization. Socialization mechanism provides various activities facilitating direct or indirect effects on knowledge diffusion. As conceived by the social comparison theory, the interplays between members help to create the opportunity for recipients to have self-evaluation which improves knowledge diffusion (Hornstein, Fisch & Holmes, 1968). The social influence theory also posited a similar argument that people within a society change and are changed by others (Milgram, 1983). Corporate socialization mechanism (Björkman, et al., 2004), training (Hatch & Dyer, 2004) were found to have positive relationship with the knowledge diffusion. Thus:

The vertical and lateral socialization activities affect the level of knowledge diffusion

Language in social context focuses on the organization specific language such as short form terms, slangs, and jargons (Chao, et al., 1994; King & Sethi, 1998; Klein & Weaver, 2000; Korte, 2009; Taormina, 2004). Language is used to conceptualize knowledge (Nonaka & Takeuchi, 1995) and makes recipients achieve the right understanding of internal communication (Fogarty & Dirsmith, 2001; Klein & Weaver, 2000). Shared language improves the recipients' ability of recognizing the knowledge and also enables the source to well codify and narrate the knowledge (Cohen & Levinthal, 1990; Keller, 2002). Thus, the following relationship is constructed:

The shared language affects the level of knowledge diffusion.

Relationships Between Determinants

Social support and willingness of source reduce the stress of the recipient which in turn increases interaction and communication between participants and strengthen the social tie (Nucholls, et al., 1972). Thus, the following relationship is constructed:

Source capability has influence on tie strength.

It is found that training activities improves participant's capability (Boland, et al., 2001; Lyles & Salk, 1996). The social influence theory posits that people are influenced by others in the society (Milgram, 1983) supports the positive relationship between socialization mechanism and participant's capability. Thus, the following relationships are formed:

Vertical socialization mechanism improves source and recipient capabilities;
Lateral socialization mechanism improves source and recipient capabilities.

For specific language, Klein & Weaver (2000) found that the same language helps members to have the right communication and thus increases tie strength. Thus, the following relationship is derived:

Shared language improves tie strength.

Age Stages

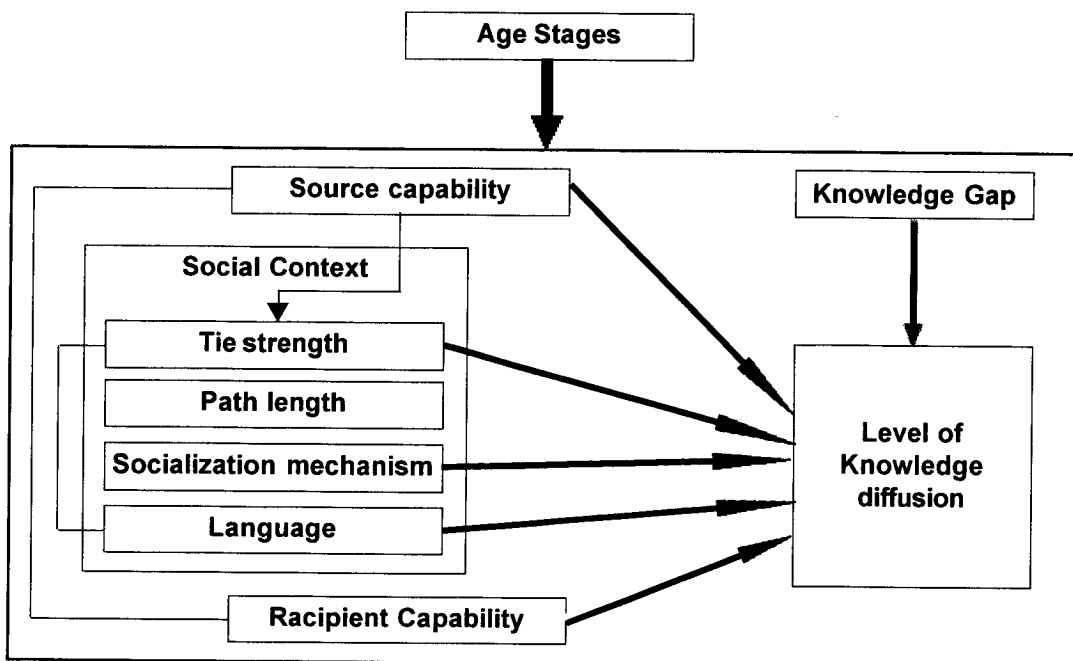
It is a common perception to us that age and working capability are related. However, studies conclude that the relationship is insignificant before age 60 and posit that the chronological age alone is

insufficient to decide a person's performance (Kreps, 1977). However, there is a different finding that states that difference can also be found for those aged under 65 (Phillips & Sternthal, 1977). In practice, the manager even perceives that 40 is the age where capability goes downhill (Kreps, 1977). The way of appropriating knowledge has been found to be different between younger and older persons (Finkelstein, Kulas, & Dages, 2003). Age changes the attitude to external factors and the way of communication (Peterson, Rhoads, & Bobby, 2001; Zenger & Lawrence, 1989), on the way of processing information (Phillips & Sternthal, 1977) and on the way of exhibition. The multilevel marketing businesses MLMs consist of agents from teenagers to the older adults. The knowledge used in MLM is not sophisticated technology and requests no creativity but replication, thus, it is plausible that the age factor should not significantly affect knowledge transfer within the context. Thus, the following hypothesis is proposed:

Hypothesis: There is no difference between age stages in the level of knowledge diffusion.

Based on the preceding explorations, the research framework is drawn in Figure 1.

Figure 1: Research Framework



RESEARCH METHODOLOGY

The study uses multigroup structural equation modeling and Fisher's z-test to test the age differences in causal relationships between antecedents and the level of knowledge diffusion. Respondents were the upline registered MLM agents that had been focusing on promoting tangible goods and maintaining an active status as managers, directors, or team leaders functioning in the MLM. Using quota sampling process (Malhotra, 2007) 480 samples (Yamane, 1967; Malhotra, 2007) was collected from seven major MLMs.

DATA ANALYSIS AND FINDINGS

There are 147 junior young adults (YA) age less than 30, 125 senior young adults (SYA) age between 31 to 39, and 124 mid/late adults (MLA) aged above 40. Factor analysis identified and combined measure items into seven latent constructs; each yielded the Cronbach's alpha of .853 to .970, sufficient for the .7 requirement (Hair, et al., 2006)

Multigroup Path Analysis for Age Stages Differences

By running structural equation modeling analysis, Table 1 reports the multigroup path analysis output of each age stage. Table 2 reports the pairwise comparisons on age group parameter differences. Differences were found between young adult (YA) and senior young adult (SYA) in knowledge diffusion as shown in Table 2 which is the relationship between vertical socialization and recipient capability (YA beta = .903 and SYA beta = .826). The difference is significant (critical ratio C.R. = -2.510 > ±1.96) and indicates that the YAs' vertical socialization accounts for more influence than the SYAs on the recipient capability. There are two differences between YA and MLA. First, the relationship between vertical socialization and source capability (YA beta = .921 and MLA beta = .815) the difference is significant (critical ratio C.R. = -2.012 > ±1.96) indicates that YAs' vertical socialization accounts for more influence than MLAs on the source capability. Second, the relationship between vertical socializa-

tion and recipient capability (YA beta = .903 and MLA beta = .655) the difference is significant (C.R. = -3.928 > 1.96) and that indicates that YAs' vertical socialization accounts for more influence than the MLAs on the recipient capability. There is a difference between SYA and MLA in the relationship between knowledge gap and knowledge diffusion (MLA beta = .372 and SYA beta .062, no sig.). The difference is significant (C.R. = -2.757 > ±1.96) indicated that MLAs' knowledge gap accounts for more influence than SYAs on the knowledge diffusion.

In comparing joint influence, Table 3 reports square multiple correlation coefficient (SMCC) differences among three age stages. In comparing YA and SYA, Fisher's Z-test exhibits the influence of YA, that yields 85.6% variance of source capability that is accounted for by the joint influence of lateral and vertical socialization, and is significantly greater than SYA respondents that yield SMCC = 74.4% at p<.01 level. Similarly, for recipient capability, YA yields 81.5% variance of recipient capability that is accounted for by the joint influence of lateral and vertical socialization, and is significantly greater than ± SYA respondents that yield SMCC = 63.7% at p<.01 level. The differences between YA and MLA are also reported in a similar trend on the relationship between socialization mechanism and participant capabilities. Fisher's Z-test exhibits the influence of YA, that yields 85.6% variance of source capability is accounted for by joint influence of lateral and vertical socialization which is significantly greater than MLA respondents that yield SMCC = 64.6% at p<.001 level. For recipient capability, YA yields 81.5% variance of recipient capability that is accounted for by the joint influence of lateral and vertical socialization, and is significantly greater than MLA respondents that yield SMCC = 46.2% at p<.001 level. The difference is also revealed between SYA and MLA that SYA yields 63.7% variance of recipient capability that is accounted for by the joint influence of lateral and vertical socialization, and is significantly greater than MLA respondents that yield SMCC = 46.2% at p<0.01 level. The rest of the joint influences among age stages are operated similarly.

The explanation for the phenomena of differences found among age groups might be due to the

Table 1: Multigroup Path Analysis of Each Age Stage

Regression Weights: (Variant model)

IDV	DV	Age <30		Age 30-39		Age >40	
		.P	Beta	P	Beta	P	Beta
Source capability (SC)	KD	0.050	0.823	0.656	-0.101	0.813	-0.047
Recipient capability (RC)	KD	0.890	-0.037	0.003	0.378	0.009	0.260
Knowledge gap	KD	0.010	0.219	0.366	0.062	***	0.372
Tie strength (TS)	KD	0.620	0.096	0.207	0.201	0.053	0.319
Lateral socialization (LSM)	KD	***	0.331	0.062	0.154	0.021	0.171
Vertical socialization (VSM)	KD	0.663	-0.228	0.172	0.319	0.846	0.033
Language (LN)	KD	0.132	-0.178	0.213	-0.092	0.827	-0.019
Path length (PL)	KD	0.364	0.072	0.441	0.05	0.062	0.127
Language	TS	0.022	0.159	0.085	0.103	0.004	0.201
Source capability (SC)	TS	***	0.775	***	0.833	***	0.758
VSM	SC	***	0.921	***	0.908	***	0.815
VSM	RC	***	0.903	***	0.826	***	0.655
LSM	SC	0.022	-0.131	0.227	-0.088	0.683	-0.030
LSM	RC	0.993	0	0.894	-0.01	0.490	0.057
LSM; VSM →	SC		0.856		0.744	0.646	
SC; LN →	TS	SMCC	0.753		0.769	0.736	
LSM; VSM →	RC		0.815		0.637	0.462	
All joint →	KD		0.538		0.671	0.611	

IDV: independent variable; DV dependent variable; KD: knowledge diffusion;

Table 2: Pairwise Comparisons Between Age Groups

Pairwise Parameter Comparisons Critical Ratios for Differences between Parameters (Variant model)

IDV	SC	RC	KWG	TS	PL	LSM	VSM	LN	SC	LN	VSM	LSM		
DV	KD													
Groups	Young adult (YA) vs. Senior Young Adult (SYA)													
C.R.	-1.914	1.601	-1.278	0.481	-0.148	-0.202	0.954	0.609	0.441	-0.740	-0.868	-2.510	-0.113	0.040
Groups	Young adult vs. Mid/Late Adult (MLA)													
C.R.	-1.883	1.069	1.294	0.941	0.553	-0.443	0.472	1.153	-1.172	0.001	-2.012	-3.928	0.680	0.772
Groups	Senior Young adult vs. mid/late Adult													
C.R.	0.208	-1.017	2.757	0.487	0.756	-0.152	-1.050	0.721	-1.732	0.850	-1.060	-1.483	0.610	0.584

C.R.: critical ratio

Table 3: Fisher's Z-tests Among Age Stages

IDV	→ DV	R ²			Beta			Sample size	Fisher's z-test					
		YA	SYA	MLA	YA	SYA	MLA		YA-SYA		YA-MLA		SYA-MLA	
		z	p	z	p	z	p							
VSM+LSM	→ SC	0.856	0.744	0.646	0.925	0.863	0.804		2.61	0.009	4.02	0.000	1.57	0.119
SC+LN	→ TS	0.753	0.769	0.736	0.868	0.877	0.858	YA=126	-0.31	0.757	0.30	0.764	0.62	0.472
VSM_LSM	→ RC	0.815	0.637	0.462	0.903	0.820	0.680	SYA=146	2.68	0.008	5.14	***	2.67	0.008
All deter	→ KD	0.538	0.671	0.611	0.733	0.819	0.782	MLA=124	-1.77	0.077	-0.89	0.374	0.85	0.395

VSM: vertical socialization mechanism; LSM: lateral socialization mechanism; SC: source capability; LN: language; All deter.: all determinants

subtle changes in age differences in the way of appropriating knowledge (Finkelstein, et al., 2003), the way of communication (Peterson, et al., 2001; Zenger & Lawrence, 1989) and the way of information processing (Phillips & Sternthal, 1977). Furthermore, as proposed, the standardized knowledge system of MLM might also be a factor that limits the difference between age groups. Thus for practitioners, if other factors remain constant, there is no age stage difference in the diffusion of knowledge.

CONCLUSIONS AND RECOMMENDATIONS

There is no overall knowledge diffusion difference among three age stages except for some subtle differences. The vertical socialization activities improve both source and recipient capability for young adults rather than the mid/late adults but improve more recipient capability in young adults than senior young adults. Another difference is the influence on knowledge gap between senior young adult and mid/late adults where the mid/late adults improve more when they perceive the knowledge gap is widened. The joint influences of socialization mechanisms on source capability are different between two age paired comparisons of YA vs. SYA and YA vs. MLA where the younger the better the socialization activities could improve the source capability. Younger age stage agents improve more on recipient capability through socialization activities than older age stage agents.

In summary, age stage does not affect on the overall knowledge diffusion even though younger personnel learn faster through activities. However, as long as the mid/late personnel perceive the knowledge gap is enlarged, the effort will be ignited and diffusion will catch up. Thus, the practitioners, especially the human resource related functions officers, can treat all age stage personnel as the same in assigning tasks for the job functions that are related to knowledge transfer.

LIMITATION OF THE RESEARCH AND FURTHER RESEARCH

This study uses MLM as the population. The

outcome might not generalized to all industries. The knowledge gap in this study adapted a subjective measure, however, if the study context is available for processing, a controlled experiment measure will be more beneficial. For multigroup analysis of knowledge diffusion, little has been done in previous studies. This arena could provide grounds for a vast number of future studies.

REFERENCES

- Baker III, H. E., & Feldman, D. C. (1991). Linking organizational socialization tactics with corporate human resource management strategies. *Human Resource management Review*, 1(3), 193-202.
- Bandura, A. (1977). *Social learning theory*: Prentice Hall.
- Barnett, E., & Casper, M. (2001). A definition of "Social environment", 91(3). *American Journal of Public Health* 91(3), 465.
- Berman, S. L., Down, J., & Hill, C. W. L. (2002). Tacit knowledge as a source of competitive advantage in the national basketball association. *The Academy of Management Journal*, 45(1), 13-31.
- Bhattacharya, P., & Metha, K. K. (2000). Socialization in the network marketing organizations: Is it cult behavior? *Journal of Socio-Economics*, 29(4), 361-374.
- Björkman, I., Barner-Rasmussen, W., & Li, L. (2004). Managing knowledge transfer in MNCs: The impact of headquarters control mechanisms. *Journal of International Business Studies*, 35(5), 443-455.
- Boland(Jr.), R. J., Singh, J., Salipante, P., Aram, J. D., Fay, S. Y., & Kanawattanachai, P. (2001). Knowledge representations and knowledge transfer. *The Academy of Management Journal*, 44(2), 393-417.
- Chao, G. T., O'Leary-Kelly, A. M., Wolf, S., Klein, H. J., & Gardner, P. D. (1994). Organizational socialization: Its content and consequences. *Journal of Applied Psychology*, 79(5), 730-743.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and

- innovation. *Administrative Science Quarterly*, 35(1), 128-152.
- Croft, R., & Woodruffe, H. (1996). Network marketing: The ultimate in international distribution. *Journal of Marketing Management*, 19, 201-214.
- Cross, R., & Sproull, L. (2004). More than an answer: information relationships for actionable knowledge. *Organization Science*, 15(4), 446-462.
- Dewey, J. (1998). *The Essential Dewey: Pragmatism, education, democracy* (Vol. 1): Indiana University Press.
- Doring, T., & Schnellbach, J. (2006). What do we know about geographical knowledge spillovers and regional growth?: A survey of the literature. *Regional Studies*, 40(3), 375-395.
- Dosi, G. (1988). Sources, procedures, and microeconomic effects of innovation. *Journal of Economic Literature*, 26(3), 1120-1171.
- Earle, L., & Earle, T. (1999). Social context theory. *South Pacific Journal of Psychology*, 11(2), 1-12.
- Feder, G., & Slade, R. (1985). The role of public policy in the diffusion of improved agricultural technology. *American Journal of Agricultural Economics*, 67(2), 423-428.
- Finkelstein, L. M., Kulas, J. T., & Dages, K. D. (2003). Age differences in proactive newcomer socialization strategies in two populations. *Journal of Business and Psychology*, 17(4), 473-502.
- Fogarty, T. J., & Dirsmith, M. W. (2001). Organizational socialization as instrument and symbol: An extended institutional theory perspective. *Human Resource Development Quarterly*, 12(3), 247-266.
- Graham, T. (1852). *Elements of Chemistry: including the applications of the science in the arts* (2nd ed.). Philadelphia: Blanchard and Lea.
- Granovetter, M. S. (1973). The strength of weak ties. *The American Journal of Sociology*, 78(6), 1360-1380.
- Grant, R. M. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science*, 7(4), 375-387.
- Gupta, A. K., & Govindarajan, V. (2000). Knowledge flows within multinational corporations. *Strategic Management Journal*, 21(4), 473-496.
- Gavrilov, L. A., & Heuveline, P. (2003). Aging of population. In P. Demeny & G. McNicoll (Eds.), *The Encyclopedia of Population*. New York: Macmillan.
- Hair, J. F. J., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis* (6th ed.): Peason Education LTD.
- Hansen, M. T. (1999). The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44(1), 82-111.
- Hatch, N. W., & Dyer, J. H. (2004). Human capital and learning as a source of sustainable competitive advantage. *Strategic Management Journal*, 25(12), 1155-1178.
- Hornstein, H., Fisch, E., & Holmes, M. (1968). Influence of a model's feelings about his behavior and his relevance as a comparison other on observers' helping behavior. *Journal of Personality and Social Psychology*, 10, 220-226.
- Hovland, C. I., & Weiss, W. (1951). The influence of source credibility on communication effectiveness. *The American Association for Public Opinion Research*, 15(4), 635-650.
- Keller, W. (2002). Geographic localization of international technology diffusion. *The American Economic Review*, 92(1), 120-142.
- King, R. C., & Sethi, V. (1998). The impact of socialization on the role adjustment of information system professionals. *Journal of Management Information System*, 14(4), 195-217.
- Klein, H. J., & Weaver, N. A. (2000). The effectiveness of an organizational-level orientation training program in the socialization of new hires. *Personnel Psychology*, 53, 47-66.
- Korte, R. E. (2009). How newcomers learn the social norms of an organization: A case study of the socialization of newly hired engineers. *Human Resource Development Quarterly*, 20(3), 285-306.
- Kreps, J. M. (1977). Age, work, and income. *Southern Economic Journal*, 43(4), 1423-1437.
- Lee, D. M. S., & Allen, T. J. (1982). Integrating new technical staff: Implications for acquiring

- new technology. *Management Science*, 28(12), 1405-1420.
- 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), 1477-1490.
- Lyles, M. A., & Salk, J. E. (1996). Knowledge acquisition from foreign parents in international joint ventures: An empirical examination in the hungarian context. *Journal of International Business Studies*, 27(5), 877-903.
- Madsen, T. L., Mosakowski, E., & Zaheer, S. (2003). Knowledge retention and personnel mobility: The nondisruptive effects of inflows of experience. *Organization Science*, 14(2), 173-191.
- Malhotra, N. K. (2007). *Marketing Research An Applied Orientation* (5th ed.). Upper Saddle River: Pearson Education.
- Marsden, P. V., & Campbell, K. E. (1984). Measuring tie strength. *Social Forces*, 63(2), 482-501.
- Milgram, S. (1983). *Obedience to Authority: An Experimental View*. New York: Harper/Collins.
- Miller, D. J., Fern, M. J., & Cardinal, L. B. (2007). The use of knowledge for technological innovation within diversified firms. *Academy of Management Journal*, 50(2), 308-326.
- Minbaeva, D. B. (2007). Knowledge transfer in multinational corporations. *Management International Review*, 47(4), 567 - 593.
- Morone, P., & Taylor, R. (2004). Knowledge diffusion dynamics and network properties of face-to-face interactions. *Journal of Evolutionary Economics*, 14(3), 327-351.
- Msweli-Mbanga, P. (2001). Modelling distributor performance in network marketing organizations. *South African Journal of Business Management*, 32(3), 33-40.
- Murray, S. R., & Peyrefitte, J. (2007). Knowledge type and communication media choice in the knowledge transfer process. *Journal of Managerial Issues*, 19(1), 111-133.
- Nelson, R. R., & Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge: Harvard University Press.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: how Japanese companies create the dynamics of innovation*: Oxford University Press.
- Nucholls, K. B., Callell, J., & Kaplin, B. H. (1972). Psychosocial assets, life crisis and the prognosis of pregnancy. *American Journal of Epidemiology*, 95, 431-441.
- Peterson, D., Rhoads, A., & Bobby, C. V. (2001). Ethical beliefs of business professionals: A study of gender, age and external factors. *Journal of Business Ethics*, 31(3), 225-232.
- Phillips, L. W. & Sternthal, B. (1977). Age differences in information processing: A perspective on the aged consumer. *Journal of Marketing Research*, 14(4), 444-457.
- Pratt, M. G. (2000). The good, the bad, and the ambivalent: Managing identification among Amway distributors. *Administrative Science Quarterly*, 45(3), 456-493.
- Pratt, M. G., & Rosa, J. A. (2003). Transforming work-family conflict into commitment in network marketing organizations. *The Academy of Management Journal*, 46(4), 395-418.
- Reagans, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly*, 48(2), 240-267.
- Regev, S., Shtub, A., & Ben-Haim, Y. (2006). Managing project risks as knowledge gaps. *Project Management Journal*, 37(5), 17-25.
- Searle, J. R. (1995). *The Construction of Social Reality*. London: Penguin Press.
- Shannon, C. E. (1948). A mathematical theory of communication. *The Bell System Technical Journal*, 27, 379-423.
- Shariq, S. Z. (1999). How does knowledge transform as it is transferred? Speculations on the possibility of a cognitive theory of knowledgescapes. [Conceptual Paper]. *Journal of Knowledge Management*, 3 (4), 243 - 251.
- Simonin, B. L. (1999). Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic Management Journal*, 20(7), 595-623.
- Simonin, B. L. (2004). An empirical investigation of the process of knowledge transfer in international strategic alliances. *Journal of International Business Studies*, 35(5), 407-427.

- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17, 27-43.
- Taormina, R. J. (2004). Convergent validation of two measures of organizational socialization. *International Journal of Human Resource Management*, 15(1), 76-94.
- Van Maanen, J., & Schein, E. H. (1979). Toward a theory of organizational socialization. *Research in Organizational Behavior*, 1, 209-264.
- Williams, C. (2007). Transfer in context: replication and adaptation in knowledge transfer relationships. *Strategic Management Journal*, 28(9), 867-889.
- Zenger, T. R., & Lawrence, B. S. (1989). Organizational demography: The differential effects of age and tenure distributions on technical communication. *The Academy of Management Journal*, 32(2), 353-376.

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