The Performance of Difference: 
Mobilizing Heterogeneous Knowledge

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The Performance of Difference: Heterogeneous Knowledge Absorption Capabilities

Abstract

This article presents a process model of the translation of workforce heterogeneity into firm performance to explain why previous research has consistently arrived at two conflicting hypotheses. Knowledge absorption capabilities of strategic decision networks and firm-level operating paradigms are theorized to play a critical role in this process. The model investigates dimensions of knowledge absorption that affect the translation of heterogeneous knowledge into strategic decisions. It further evaluates how firm-level operating paradigms influence this translation process.

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Workforce heterogeneity as a strategic resource has received little theoretical and empirical attention even though the human element has been argued to affect organizational action (Thompson, 1967) and strategic choice (Finkelstein & Hambrick, 1996) and has grown in importance to firm performance along with the critical role of knowledge (Grant, 1996; Zahra & George, 2002). Empirical research endorses two conflicting hypotheses: value in diversity (Cox & Blake, 1991) and ineffective workgroup functioning (Williams & O’Reilly, 1998). Research supports both the view that workforce heterogeneity enhances performance through the use of higher overall group problem solving abilities (Cox, 1993; Hoffman & Maier, 1961; McLeod, Lobel, & Cox, 1996) and the view that these aggregate differences inhibit performance by reducing social integration (Jackson, Stone, & Alvarez, 1993) and informal communication (Smith, Smith, Olian, Sims, O’Bannon, & Skully, 1994). These inconsistencies have led to the conclusion that workforce heterogeneity will not be found to improve firm performance until researchers gain an understanding of relevant contextual factors (Pfeffer, 1994; Williams & O’Reilly, 1998).

Research by Hitt and his colleagues (2001) provides empirical support for the value of human capital in enhancing firm performance and demonstrates that this relationship is complex with both direct and moderating effects. This study of large law firms, highly dependent on knowledge obtained from individual experience and relationships, found a curvilinear relationship (U shaped moderated by time) between human capital and strategic performance. They found that indirect effects from degree of diversification, experience with diversification, and organizational structure create human capital leveraging efficiencies and build tacit knowledge while at the same time lead to additional leveraging and monitoring costs that decrease over time (Hitt, Bierman, Shimizu, & Kochhar, 2001). This study suggests that the
value of workforce heterogeneity may lie in providing firms with heterogeneous knowledge and experience (Cox, 1994; Priem, Harrison, & Muir, 1995) that enable them to handle change (Iles & Hayers, 1997) especially in complex environments. It also indicates that building resource advantages from human capital may require a translation process that facilitates the absorption of knowledge differences and focuses on the relational configurations of decision-makers.

Building on this study, knowledge absorption capacity (Cohen & Leventhal, 1990; Grant, 1996; Kim, 1995, 1998; Szulanski, 1996; Zahra & George, 2002) and social network theory (Burt, 1992 & 1997; Coleman, 1988; Lin, 2001, Nahapiet & Ghoshal, 1997; Podolny & Baron, 1997), the goal of this research is to investigate the organizational constructs that affect the relationship between workforce heterogeneity and firm performance. As such, this paper develops a process model of the translation of heterogeneous knowledge into strategic decisions through inter-firm decision networks. The knowledge absorption capabilities of strategic decision networks and firm-level operating paradigms are theorized to play a critical role in facilitating or inhibiting this translation process. Two specific research questions that will further this investigation are examined in this paper.

1. What dimensions of knowledge absorption, when coupled with strategy process, affect the translation of heterogeneous knowledge into strategic decisions?
2. How do firm-level operating paradigms influence this translation process?

WORKFORCE HETEROGENEITY

Despite the amount of research on the relationship between workforce heterogeneity and performance outcomes, very little is known about the translation process. Scholars have studied diversity in terms of geographic markets (Sambharya, 1995), technology (Kidd & Teramoto,
1995), culture (Hofstede, 1980), identity groups (Cox, 1993; Jackson, 1992; Nkomo, 1992),
functional expertise (Thomas, Lischert, & Ramaswamy, 1991), educational level (Bantel &
Jackson, 1989), and industry tenure and experience (Eisenhardt & Schoonhoven, 1990). The
three common themes that have received the most attention in the literature are international
diversification (Kidd & Teramoto, 1995; Morrison & Roth, 1992; Tallman & Li, 1996; Zahra,
Ireland, & Hitt, 2000), group dynamics (Cox, 1993; Jackson , 1991, 1992; Jehn, 1995; McLeod,
Lobel, & Cox, 1996, O’Reilly, Caldwell, & Barnett, 1989), and strategic decision-making

Typically, each of these themes has been studied separately from the other, and
separately from organizational practices in which the knowledge that is critical to firm
performance is shared. Nonetheless, the research from each of these streams tends to support the
same conclusions. As illustrated in figure 1, workforce heterogeneity tends to lead to increases
in perspectives, cognitive resources, and problem solving approaches that improve decision-
making and at the same time to problems with informal communication and social integration.
An overview of these findings is discussed below.

The first stream of research focuses on the increasing reliance on international
diversification for financial growth and performance improvement (Zahra, Ireland, & Hitt,
2000). Heterogeneity in this context has been measured by five factors; the number of countries
of operation (Tallman & Li, 1996), targeted market segments (Morrison & Roth, 1992) and the
degree of technological (Kidd & Teramoto, 1995), geographic (Sambharya, 1995) and cultural
Hofstede, 1980) heterogeneity in a portfolio of global business operations. International diversification exposes firms to diverse operating environments and increases the ability to discover and utilize local knowledge in its strategic activities (Hammell & Prahalad, 1994). Workforce heterogeneity in this context focuses on the role of culture in facilitating this process. However since the definition of heterogeneity is on based on operational and market attributes rather than on workforce attributes, it does not adequately link workforce heterogeneity to firm performance outcomes.

The second research theme provides the critical link to firm performance through strategic decision-making. Studies indicate that heterogeneity in top management characteristics is positively related to innovativeness (Bantel & Jackson, 1989), change (Finkelstein & Hambrick, 1990), competitive moves (Hambrick, Cho, & Chen, 1996) and growth rates (Eisenhart & Schoonhoven, 1990). However, limiting the characteristics studied to education level (Bantel & Jackson, 1989), functional background (Thomas, Lischert, & Ramaswamy, 1991), and industry tenure and experience (Eisenhardt & Schoonhoven, 1990) restricts the implications of these studies. These scholars argue against Jackson’s (1992) distinction between “personal attributes” and “task-related attributes” because of their likely overlap (Hambrick, Cho, & Chen, 1996) but don’t consider the relevance of this distinction in linking these attributes to strategic performance. Since the relevance of task-related attributes can shift as business context or focus changes but personal attributes tend to remain stable over time and are required irrespective of business circumstances, a separate investigation of the role of these attributes in strategic decision-making is important.

The third research stream focuses on the impact of identity group heterogeneity on group dynamics and organizational functioning (O’Reilly, Caldwell, & Barnett, 1989). Ethnic
heterogeneity in workgroups has been found to lead to higher quality decisions (Cox, 1993; McLeod, Lobel & Cox, 1996) associated with the generation and use non-traditional perspectives and alternatives (Watson, Kumar & Michaelsen, 1993) that result in a more thorough identification and analysis of critical business issues (Jackson, 1992). Studies of group process skills (Jackson, 1992), conflict (Jehn, 1995), and social integration (O’Reilly, Caldwell & Barnett, 1989; Jackson Stone, & Alvarez, 1993) found these differences to have a negative impact on organizational functioning and group performance. Research on cooperative norm development (Chatman & Flynn; 2001) points to the role of organizational factors as moderators to these effects, but yet these constructs have not been studied in terms of how they affect the ability of firms to absorb knowledge arising from these identity group experiences.

A seminal work by Richard (2000), drawing on the effects of context on resource value (Barney & Wright, 1998), demonstrates that strategic constructs may mediate the relationship between workforce heterogeneity and firm performance. His research shows that racial heterogeneity is positively related to firm performance in growth contexts and that increases in strategic growth can enhance this effect. This study suggests that future research focusing on strategic constructs may shed more light on where the value in diversity lies and how to establish management practices that enhance their effect on firm performance.

MODEL OF THE TRANSLATION PROCESS

The model developed in this paper examines the effects of heterogeneous knowledge absorption practices on strategic decision process outcomes and their interaction with firm-level operating paradigms. The translation of heterogeneous knowledge into successful strategies is proposed to occur within the realm of strategic decision networks. Dimensions of the translation
process include 1) the presence of workforce heterogeneity in strategic decision networks, 2) the knowledge absorption practices utilized when incorporating tacit knowledge into strategic decisions, and 3) the structure of firm-level operating paradigms. Each of these components is presented in figure 2 and discussed in this section.

Firm Performance

The focus of this paper is on the translation process itself as a performance moderator rather than on the direct relationship between workforce heterogeneity and firm performance. The model proposes that the degree to which workforce heterogeneity affects firm performance positively or negatively depends on the extent to which knowledge absorption practices, when embedded in strategic decision networks, facilitate the translation of heterogeneous knowledge into successful strategic decisions.

Since knowledge that is relevant to firm performance is likely to be context dependent, performance criteria for different operating conditions may lend itself to different types of heterogeneity. The type of heterogeneity may lead to different performance outcomes depending on the overlap of it as a knowledge source with the firm’s strategic options and knowledge of operating realities. For example, a firm pursuing international markets may have a greater need for ethnic heterogeneity than would a domestic firm. As such, the model doesn’t address any particular identity group but rather focuses on the role of heterogeneous, tacit knowledge in improving strategic decisions. This is done, first, to elaborate on the potential effects of this
construct in understanding the translation process and second, to provide a unique arena for studying the mediating effects of organizational factors on the value in diversity hypothesis.

Strategic Decision Networks

Strategic decisions tend to have long time horizons, large expenditures, and significant departures from status quo and are difficult to undo whereas tactical decisions such as price changes tend to be relatively easy to adjust and have limited implications on firm performance (Chen, Smith, & Grimm, 1992). The model emphasizes strategic decisions since they, by definition, tend to have a greater impact on firm performance than do tactical decisions. Specifically, strategic decisions are characterized as having a high interdependence between knowledge of operating realities and degree of strategic success. Similar to the Hitt et al. (2002) study, these decisions are highly dependent on the tacit knowledge that is embedded in identity group experiences and on the relationship configurations of the strategic decision network.

Network decision-making is becoming increasingly important for firms that cross national boundaries and have multiple stakeholder constituencies since it facilitates the development of flexible and responsive strategies (Donnellon, 1996). Networks can provide firms with economies of specialization (Ahuja, 2000) by bringing together complementary knowledge (Arora & Gambardela, 1990; Powel, Koput, & Smith-Doerr, 1996). They are most useful when transactional considerations related to rapid change and degree of environmental complexity make networks structures a viable option (Mitchell & Sigh, 1996).

Strategic decisions made in a network configuration are dependent on the content and flow of knowledge. Knowledge content consists of 1) information, defined as facts or distinct data that can be transmitted directly through simple communication and 2) know-how or the tacit components of knowledge, in other words accumulated skills and expertise that is transmitted
through experience (Szulanski, 1996). Knowledge flows are comprised of knowledge-sharing routines (Dyer & Noboka, 2000), contractual transfers and uncompensated spillovers/leakages (Bernstein & Nadiri, 1989; Jaffe, Trajtenberg, & Henderson, 1993). These flows require sustained interaction of a mutually dependent network characterized by frequent communication on a narrow range of issues related to a specified subject (Gulati & Singh, 1998). Contractual transfers are more likely to involve information, knowledge-sharing routines primarily contain know-how, or tacit components of knowledge, and knowledge spillovers and leakages are more likely to include both.

Heterogeneous strategic decision networks are comprised of those considered dominant in or influential to the development of strategic decisions. What makes them heterogeneous is the degree to which tacit knowledge arising from identity group experiences is embedded in the network. Tacit knowledge, defined as knowledge that is difficult to abstract from the individuals in possession of it, is transmitted through direct experience (Polanyi, 1962) or through discussion with those who have direct experience with the context in which it is embedded. Embeddedness is the degree to which tacit knowledge resides in the network and in the way in which individuals in the network interact with each other when making strategic decisions. Heterogeneous strategic decision networks, therefore, are intra-firm networks in which heterogeneous knowledge arising from the diverse identity group experiences are embedded.

The degree of embeddedness of tacit knowledge in strategic decision networks is dependent on the relative degree to which weak vs. strong ties have been developed. Burt (1992) makes a strong case for weak ties. He argues that two network design mechanisms, 1) maximizing structural holes provides linkages to other networks and 2) developing weak ties with multiple clusters throughout the network creates opportunities to gather information and
control the benefits derived from network relationships. Others make a case for strong ties (Coleman, 1988; Walker, Kogut & Shan, 1997). They argue that densely embedded networks encourage knowledge sharing that fosters know-how transmission and joint problem-solving. Since the knowledge content varies with the strength of ties, I propose that the relative use of weak vs. strong ties depends on the content and flow of the knowledge that is required by the network to make strategic decisions.

Since weak ties tend to lead to information and strong ties to know-how benefits, I propose that for firms to translate heterogeneous knowledge into strategic decisions requires both strong intra-firm network ties and linkages to other networks. Strong ties tend to create the incentive and opportunity to share tacit knowledge so that knowledge relevant to strategic issues is either embedded in network practices, held by network members, or accessed by linkages to other networks. Since non-redundant linkages provide networks with access to new knowledge (Burt, 1992), the connections to other networks are more likely to occur when the strategic decision network is heterogeneous than when it is homogeneous.

Workforce Heterogeneity

The performance outcomes of the translation process are proposed to be based on the ability of strategic decision networks to absorb tacit knowledge when making strategic decisions. Knowledge absorption is an interrelational learning process of knowledge flow from individual cognition to the knowledge stocks residing in organizational practices (Brown & Duguid, 1991). Individual knowledge, therefore, is the essential component of organizational learning (Attewell, 1992; Crossan, Lane, & White, 1990, Stinchcombe, 1990) and the network’s ability to absorb tacit knowledge. Weick (1991) argues that individual learning is a process of replacing a routine with a new response based on new knowledge or understanding. The opposite is true for
organizational learning. It is the creation of a routine that enables individuals to respond similarly to different circumstances. This suggests that networks absorb new knowledge only when individual responses vary from the standard practice. Therefore, individuals, adept at knowledge transmission and routine modification, are a prime source of tacit knowledge.

The breadth and depth of knowledge exposure can influence the tendency to search for and utilize new sources of knowledge (Van Wijk, Van den Bosch, & Volberda, 2001) when making strategic decisions and to develop new organizational capabilities (McGrath, MacMillan, & Venkataraman, 1995) that facilitate effective future strategic decisions. Knowledge exposure, however, does not necessarily lead to higher levels of knowledge absorption unless the knowledge is related to and yet different from the knowledge already possessed by the network (Lofstrom, 2000; Matusik, 2000; Zahra & George, 2002). The ability to translate heterogeneous knowledge into successful strategic decisions, therefore, requires that people in the network transmit tacit knowledge that overlaps with the knowledge already in its possessed and is relevant to the strategic issues and environmental conditions in which the firm operates.

Workforce heterogeneity may be a means of absorbing new, tacit knowledge that is relevant to the firm’s strategic issues and yet different from the knowledge that is already embedded in network practices. Since tacit knowledge can only be accumulated through experience and active learning (Polanyi, 1962), it cannot be absorbed independently of the person in possession of the knowledge (Winter, 1987). The primary way for this knowledge to be absorbed is through face-to-face communication with individuals who have experience with the operating context in which the knowledge is embedded (Garvin, 1993; Inkpen, 1995; Nonaka, 1994) and who understand its interrelationship to the strategic issues of the firm. This suggests that workforce heterogeneity may be positively related to firm performance when the knowledge
possessed provides the strategic decision network with exposure to diverse operating realities and when the network is able to translate this knowledge into strategic decisions.

Heterogeneous Knowledge Absorption Practices

The primary objective of this paper is to begin to describe network practices that facilitate the translation of heterogeneous knowledge into strategic decisions. Heterogeneous knowledge absorption practices are defined as the ability to acquire, assimilate and translate tacit knowledge arising from identity group experiences into successful strategic decision process outcomes. Key dimensions of these practices are the presence, expression and interpretation of heterogeneous, tacit knowledge. Following Zahra and George’s (2002:192) model of ACAP, the presence of workforce heterogeneity is a source of heterogeneous knowledge. Expression is an activation trigger that facilitates the assimilation of complementary knowledge into the decision-making process. Interpretation is a social integration mechanism that transforms heterogeneous knowledge into strategic decisions.

To translate workforce heterogeneity into firm performance requires organizational practices that provide strategic decision networks with the ability to apply new knowledge to opportunities (Cohen & Leventhal, 1990) and to transform this knowledge into workable decisions (Kim, 1998). This is accomplished when knowledge absorption capabilities are developed that address the tacit components of knowledge (Mowery & Oxley, 1995) and embed this knowledge in strategic decision network practices.

Leonard-Barton (1992; 1995) argues that knowledge embeddedness is based on the interrelationship between 1) employee skills, 2) managerial processes, 3) firm values, norms and practices, and 4) the physical systems of organizations. This suggests that the key to the translation process is the development of knowledge absorption capabilities that enable tacit
knowledge that is embedded in identity group experiences of a heterogeneous strategic decision network to become embedded in the network decision practices. This also suggests that how knowledge absorption practices that are employed when making strategic decisions influence these four dimensions may impact whether or not heterogeneous, tacit knowledge is translated into successful strategic decisions.

As pressure for knowledge of operating environments intensifies and the conditions in which firms operate become more relationship intensive, tacit knowledge is likely to become more relevant to firm performance. Heterogeneous knowledge absorption practices, therefore, may be a critical capability in broadening the scope of tacit knowledge without increasing the complexity of the decision criteria so that calculated risks about opportunities in unfamiliar operating contexts can be made. As in the Hitt et al. (2002) study, strategic decision networks that embrace these practices can, over time, create workforce heterogeneity leveraging efficiencies and accumulate tacit knowledge about diverse operating conditions. There may be additional costs initially associated with this endeavor, but these costs are likely to decrease over time as these networks become more adept at absorbing tacit knowledge.

Operating Paradigms

The secondary objective of this paper is to begin to describe ways in which firm-level operating paradigms facilitate or inhibit the absorption of heterogeneous, tacit knowledge. The degree to which this knowledge translates into better strategic decisions depends not only on heterogeneous knowledge absorption practices but also on the operating paradigms of firms. Three such paradigms are; shared values, diversification, and organizational learning. These paradigms influence the form that heterogeneity takes in the network and the degree to which heterogeneous knowledge is present, expressed and interpreted when making strategic decisions.
The shared values paradigm defines heterogeneity in terms of task or experience and tends to lead to the presence but not the expression or interpretation of heterogeneous knowledge. The diversification paradigm demonstrates that focusing on knowledge diversity tends to tax the network’s cognitive abilities and limits expression while at the same time facilitates interpretation of tacit components of knowledge. The learning organization paradigm emphasizes idea diversity and demonstrates that even when knowledge is expressed and interpreted, knowledge absorption will always be limited by the degree to which heterogeneous knowledge is present.

HETEROGENEOUS KNOWLEDGE ABSORPTION PRACTICES

The degree to which identity group differences are effective in translating heterogeneous knowledge into strategic decisions is dependent not only on the presence of heterogeneous knowledge but also on the ability for these differences to be expressed and correctly interpreted. As indicated in figure 3, the combined effects of heterogeneous knowledge absorption practices have a moderating effect on the relationship between workforce heterogeneity and firm performance. These effects are sequential. The presence of heterogeneity in the network is a necessary condition if heterogeneous knowledge is to be available for strategic decision purposes. The presence of heterogeneous knowledge, therefore, is only a measure of potential. In order for this knowledge to be utilized in strategic decisions, it needs to be brought to the attention of the network through its expression. Expression, however, doesn’t guarantee that heterogeneous knowledge will be incorporated into strategic decisions or that the decisions contingent upon it will lead to successful outcomes. The knowledge must also be interpreted, meaning understood in its context and discussed in terms of its relationship to strategic issues. I
propose that when heterogeneous knowledge absorption practices are part of strategic decision networks, they improve firm performance by leading to better decision process outcomes.

Heterogeneous Knowledge Presence

Heterogeneous knowledge presence is an indication of the potential to access to new knowledge. It is derived from identity group heterogeneity, defined as the number of homogeneous groups and the degree of dispersion in the network among them (Blau, 1977). Presence opens the network to new sources of knowledge by increasing the network span (Burt, 1992) and providing potential access to new perspectives, cognitive resources and problem solving approaches that have been found in previous studies to improve group decision-making. Heterogeneous knowledge presence in strategic decision networks doesn’t necessarily lead to these outcomes, but without it, a knowledge contribution is unlikely to occur at all, much less be considered by networks to be complementary.

Since the process of making strategic decisions tends to direct strategic decision networks toward the critical issues facing the firm, the presence of heterogeneous identity groups in the network is likely to lead to an increased number of people throughout the firm who are knowledgeable about strategic issues. This arises irrespective of the degree to which informal communication and social integration occurs among those in the network. Recall that one of the ways in which knowledge flows through networks is informal spillovers or leakages. The presence of heterogeneous knowledge, therefore, is likely to lead to knowledge spillovers and leakages that flow out of the network and toward individual members. Since those present are
more likely to hear what is going on, they are more likely than those who are not present to be aware of a wider array of issues facing the firm. As this awareness is communicated to those outside the network, a greater amount and diversity of information will be accessible to organizational members since a greater number of social networks linkages (Burt, 1992) are represented in a heterogeneous network than in a homogeneous network.

Proposition 1: Heterogeneity knowledge presence is positively related organization-wide understanding of strategic issues.

Heterogeneity Knowledge Expression

Heterogeneous knowledge expression preserves cultural distinctions so that new knowledge can be available for making strategic decision. Expression typically involves knowledge flows related to such contractual transfers as facts about operating conditions or task expertise and to knowledge spillovers/leakages. Knowledge flow arising from expression brings the knowledge obtained from network members into the network in a fragmented form. When the content is information, expression tends to clarify issues. When it involves tacit knowledge, expression acts as an activation trigger that facilitates the search for additional information so that the tacit knowledge can be evaluated for its complementary fit to the strategic issue at hand. Expression of tacit knowledge, therefore, tends to generate of a wider range of perspectives, cognitive resources and problem-solving approaches when making strategic decisions.

Heterogeneous knowledge expression requires trust (Whitener, Bordt, Korsgaard, & Werner, 1998). Since trust is an attitude ensuing from perceptions and attributions of previous observations or experiences (Robinson, 1996), the presence of heterogeneity tends to reduce the degree of trust among those in the network. It has been argued (Whitener et al., 1998) that it is more difficult to exchange knowledge with someone who is different than with someone who has
similar characteristics. Therefore, the translation of heterogeneous knowledge into better strategic decisions isn’t as simple as assuming that tacit knowledge arising from identity group experiences will be expressed when the decision network is heterogeneous. It also requires developing trusting relationships among those in the network through norms and practices that value tacit knowledge contributions and equalize the power of those in the network.

The dispersion of power in strategic decision networks plays a critical role in the expression of complementary, tacit knowledge. Power is a necessary condition of strategic decision-making because it gives those in the network the ability to search for opportunities, formulate strategic initiatives and allocate firm resources to a number of different opportunities (Porter, 1980). Power also determines the degree of individual vs. collective and directive vs. consensual decision making (Peng & Heath, 1996). The way in which power is dispersed among strategic decision-makers, therefore, will determine the degree of decision-making participation and new knowledge expression by those in the network when making a strategic decision.

When new knowledge that is expressed is ignored or discounted, faultlines (Lau & Murnighan, 1998) may develop that divide the network into factions and/or silence the subordinated groups. These practices tend to reinforce dominant values (Caproni, 1997) and lead to organizational silence (Lau & Murnighan, 1998) or create organizational stressors like social traps (Barry & Bateman, 1996) that act as decision norms in which hypothesis confirming questions aren’t asked that challenge hidden premises to discover flaws and lapses in knowledge. When power is more evenly dispersed among decision-makers, the perspectives, cognitive resources and problem-solving approaches that arise from tacit knowledge spillovers/leakages are more readily utilized when making strategic decisions.
When tacit knowledge is expressed, the complexity of the operating environment is revealed which has a tendency to foster either a proliferation of proactive search activities or an evaluation of the expressed knowledge through committee assignment. The latter tends to isolate its assimilation to a network pocket rather than to the network as a whole. The former is likely to lead to further tacit knowledge spillovers/leakages. In either case, the fragmentary nature of the expressed knowledge tends to introduce a level of complexity to the process that increases the amount of knowledge spillovers/leakages especially in the form of perspectives, cognitive resources and problem solving approaches.

Proposition 2a: Heterogeneity knowledge expression is positively related to the breadth of perspectives, cognitive resources and problem-solving approaches generated when making strategic decisions.

Expressing heterogeneous knowledge also broadens the firm’s strategic focus since heterogeneous networks tend to have a wider range of experiences to draw upon (Watson, Kumar & Michaelsen, 1993) and broader external networks (Jackson, 1992) than do homogeneous networks. Knowledge of diverse ideas, perspectives and practices (Hitt, Hoskisson & Kim, 1997) facilitates the use of knowledge sources from diverse local operating conditions (Hammel & Prahalad, 1994). New solutions and technological capabilities are afforded to firms that understand many different consumption patterns, new technologies and approaches to business (Argryres, 1996a) and that initiate the search for new solutions into unfamiliar territory (Levett & March, 1988). As such, the utilization of new perspectives, cognitive resources and problem solving approaches is likely to the development of new strategic initiatives.

Proposition 2b: Heterogeneity knowledge expression is positively related to the scope of strategic initiatives.
Expression doesn’t necessarily lead to the absorption of tacit knowledge or to effective strategic decisions. Acting on expressed knowledge when the network is homogeneous is entirely different than acting on it when the network is heterogeneous. Heterogeneous networks often don’t have a common understanding of the issue, a common language for analysis or common practices with which to implement a solution. Further, researchers have demonstrated that accurate information expression doesn’t necessarily influence decision processes (Janis, 1982; Vaughn, 1996) and that effective action can be constrained due to cognitive and motivational barriers (Fiol, 1994; Szulanski, 1996). This suggests that something else other than expression is also required to translate heterogeneous, tacit knowledge into strategic decisions.

Heterogeneous Knowledge Interpretation

For heterogeneous knowledge to be translated into strategic decisions, it needs to be interpreted. Tacit knowledge arising from identity group experiences can be adequately interpreted as long as it isn’t locked away from the meaning it has in an ongoing pattern of life (Geertz, 1973). Since the meaning given to it depends on the cognitive frame (Kelly, 1955; Mischel & Shoda, 1995) through which it is evaluated, heterogeneous knowledge interpretation is a means to examine the relationship of tacit knowledge of network members to that embedded in network practices and its operating conditions. This involves looking at tacit knowledge in its original context and reframing strategic issues in light of this knowledge prior to generating, evaluating and selecting courses of strategic action.

Heterogeneous knowledge interpretation balances the commonality and uniqueness of identity group experiences through the extension and continuity of interactions (Chen, Smith & Grimm, 1992) among network members. Know-how or the tacit components of knowledge has been proposed earlier to be most successfully absorbed through knowledge-sharing routines. It is
a process that requires strong ties and is most successful in social settings because it provides the forum in which informal discussions can arise in a non-threatening way. Research has shown that social relationships are critical not only for obtaining knowledge (Grandovetter, 1973; Szulanski, 1996) but also for collectively solving cognitively complex tasks (Weick & Roberts, 1993; Hutchins, 1991).

Interpretation may be constrained by motivational or cognitive impediments (Dougherty, 1992; Szulanski, 1996) because social interaction tends to occur between those with similar sets of socially important attributes (Ibarra, 1993, 1995). This can be counteracted by efforts to include heterogeneous identity groups in top management social networks. Doing so can act as a signal reflecting the categorical valuation of membership in identity groups (Tajfel, 1982) and provide a sense of belonging (Ashforth & Mael, 1989) to the network that influences subsequent interactions and strengthens the relational power of the network. Heterogeneous knowledge interpretation, therefore, is conditioned by the way in which informal communication and social integration nurtures social relationships among strategic decision network members.

Proposition 3a: Heterogeneous knowledge interpretation is positively related to social integration and informal communication of strategic decision networks.

Heterogeneous knowledge interpretation puts tacit knowledge into a strategic context through discussion. It tends to enhance strategic decision effectiveness and the scope of decision paradigms through the accumulation of complementary, tacit knowledge that can be drawn upon for present and future decisions and to a build up of inter-firm social capital that facilitates further interpretive activities. Translating heterogeneous knowledge into strategic decisions involves coupling the tacit knowledge possessed by diverse network members through active participation in unstructured discussions about critical issues facing firms. As long as there is
diversity and a degree of knowledge overlap during these social interactions, interpretation is likely to lead to a greater degree of network understanding of operating conditions and to alignment of these diverse conditions with the strategic performance criteria of the firm.

Proposition 3b: Heterogeneous knowledge interpretation is positively related to knowledge of operating environments.

This suggests that firms can benefit from workforce heterogeneity when tacit knowledge arising from identity group experiences is absorbed by strategic decision networks through the presence, expression and interpretation of heterogeneous knowledge when making strategic decisions. Information brokerage benefits from heterogeneous knowledge presence arise from non-overlapping ties (Burt, 1992) that provide linkages to external networks so that intra-network information sharing occurs. Know-how benefits from the expression and interpretation of heterogeneous knowledge arise from strong intra-firm network ties that develop trust and cooperation (Coleman, 1988) so that tacit knowledge-sharing occurs between networks.

INFLUENCE OF OPERATING PARADIGMS

The degree to which heterogeneous knowledge translates into strategic decisions is also dependent on firm-level operating paradigms. These paradigms affect the type of knowledge heterogeneity present in networks and the ability of these networks to absorb new knowledge. Shared values paradigm illustrates the struggle with incorporating knowledge differences amidst prevailing practices and norms. Diversification paradigm demonstrates how firms that endorse the value in diversity hypothesis grapple with issues of new knowledge assimilation. Learning organization paradigm reveals that even when complementary knowledge is absorbed, the degree to which it is new is dependent on the degree to which network members are heterogeneous.
Shared Values

Firms with a shared values paradigm recognize that team performance is becoming increasingly important and have embraced group decision structures in an attempt to be more responsive and flexible to changing market conditions (Donnellon, 1996). To develop strategic decisions that are consistent with the firm’s shared mission and objectives, these workgroups are expected to share information, experiences and values (Jackson, 1992) on a regular basis.

With a shared values paradigm, workforce heterogeneity often fails to improve firm performance because group processes tend to compromise their productivity (Wagner, Pfeffer, & O’Reilly, 1984) and introduce problems of motivation, coordination and conflict (Jehn, 1995). Group motivation and coordination is typically addressed by developing group objectives and communicating shared values that are reinforced by monetary rewards. These practices tend to increase organizational understanding of strategic issues and develop a shared commitment to organizational goals. Performance measures direct the group’s activities toward these goals while conflict management techniques neutralize problems and facilitate effective workgroup functioning and performance.

Shared values, therefore, can lead to resistance to difference that manifests itself as “surface level” without the concurring “deep level” diversity (Harrison, Price, & Bell, 1998). Difference tends to be tolerated as long as it can be homogenized into a pool of common practices and understandings. This paradigm has a tendency to lead to task heterogeneity, but it also tends to reinforce dominant values (Caproni, 1997) so that perspective variety, shown to lead to higher group functioning, is minimized (Tsui & O’Reilly, 1989).

Firms with a shared values paradigm usually have heterogeneous knowledge present among decision-makers but are unable to translate it into strategic decisions because dominant
practices and norms get in the way. Acculturation, a learning process that exposes minority
groups to mainstream practices and provides membership in and access to (LaFromboise,
Coleman & Gerton, 1993) the business networks, has been criticized (Thomas, 1993) for being
“a unilateral process by which subordinated identity groups adopt the norms and values of the
dominant group in the organization” (Cox, 1991:35). This practice tends to homogenize
difference into a shared pool of understanding that prevents expression and interpretation of
heterogeneous knowledge. Without expression and interpretation, strategic decision networks
will be unable to transform new knowledge into strategic decisions.

Proposition 4: A shared values paradigm is unrelated to heterogeneous knowledge
presence and negatively related to heterogeneous knowledge expression and
interpretation.

Knowledge Diversification

The diversification paradigm focuses on market and capability differences and on identity
group heterogeneity as a means to capture and exploit valuable market, technological and
cultural knowledge. Firm exposure to diverse operating environments has been shown to
augment their technological abilities (Barkema & Vermeulen, 1998) and facilitate the
accumulation of diverse knowledge (Hitt, Hoskissin & Kim, 1997) and its deployment to local
circumstances (Hammel & Prahalad, 1994). Workforce heterogeneity, in this context, focuses
the role of cultural differences in developing strategies and business practices aligned with
market preference and capability differences.

Firms with a diversification paradigm are facing many of the same issues that firms
diversifying their business portfolios were in the 1970’s. Executives found it difficult to align
corporate goals to operating issues and transfer best practices across operations. The same issues
arise with knowledge diversification. Lessons from this era have led firms to tailor strategic
decisions to the diversity in operating conditions, however the variation in these conditions has
resulted in the same information overload and confusion that arose with business unit
diversification. As the complexity of diverse consumption patterns, cultural practices (Hofstede,
1980) and institutional environments (Kostova, 1999) taxes the firm’s cognitive abilities (Jones
& Hill, 1988), it becomes more costly to interrelate (Argyres, 1996a) and more difficult to
transfer knowledge across business units (Barkema & Vermeulen, 1998).

The heterogeneous knowledge expression is limited by the tendency to ignore, forget or
filter out complementary, tacit knowledge. There is so much knowledge entering the strategic
decision network that it is difficult to determine what knowledge is complementary unless the
knowledge focus is limited to what is already known or perceived to be relevant to the task at
hand. Therefore, a diversification paradigm can prevent heterogeneous knowledge from being
absorbed by strategic decision networks.

A diversification paradigm also tends to lead to knowledge heterogeneity based on
identity group fit to specific business opportunities (Thomas, 1993). There are two problems
with this approach. First, as market and capability coalitions shift, specific identity groups are
likely to emerge, dominate and recede in response to salient organizational issues (Nord, 1978).
This may lead to the commitment of these groups being replaced by organizational silence or
opportunistic behavior that inhibits the search for and expression of tacit knowledge. Second,
since these opportunities tend to be linked to market characteristics, dominant operating norms
and decision paradigms may develop around market idiosyncrasies that inhibit the search for and
expression of new tacit knowledge. Without expression, this knowledge is likely to remain
embedded within the operating context in which it was discovered and, thereby, limit the scope of strategic initiatives.

On the other hand, this paradigm emphasizes that diversity is a natural part of complex environments and embraces a multicultural agenda. Heterogeneous knowledge interpretation is a critical strategic activity of the network since tacit knowledge leaves the firm better equipped to improve communication with (Jackson & Alvarez, 1992) and perceptions of product/service quality and effectiveness (Triandis, Kurowski, & Gelfand, 1994) across heterogeneous markets. These ongoing, open discussions of operating realities and their relationship to a given strategic issue tends to provide strategic decision networks with a greater understanding of unique conditions under which they operate.

Proposition 5: A diversification paradigm is negatively related to heterogeneous knowledge expression and positively related to heterogeneous knowledge presence and interpretation.

Learning Organization Paradigm

Firms that embrace a learning organization paradigm see individuals as the prime source of knowledge (Attewell, 1992; Crossan, Lane, & White, 1999; Hayek, 1948 Penrose, 1959) and rely on them to formulate their knowledge into workable strategies. These firms recognize that knowledge doesn’t exist in concentrated forms, but is dispersed among individuals in incomplete and sometimes contradictory forms (Hayek, 1948). Since decisions contingent upon it can only be made by or in active cooperation with the person in possession of the knowledge, knowledge sharing and learning different ways of doing things are a natural part of organizational life. Informal communication, used to interpret new knowledge, is a major element of these social interactions.
A learning organization paradigm tends to lead to strategic decision networks comprised of creative, change-oriented individuals with strong ties to each other. Theoretically speaking, this paradigm is likely lead to well-informed networks adept at translating heterogeneous knowledge into strategic decisions. Practically speaking, however, expression and interpretation of tacit knowledge can exist without the presence of heterogeneous knowledge. If network exchanges are among those with homogeneous characteristics, there may be a tendency for the knowledge expressed and interpreted to be homogeneous.

When strategic decision networks have homogeneous characteristics, it may limit the interconnectivity to other social networks. The lack of linkages other heterogeneous networks can prevent complementary, tacit knowledge that is unfamiliar to network members from entering the network and thereby limit the focus of decision-making to redundant knowledge that reinforces common understandings and standard practices. This can lead either to strategic decisions skewed by these knowledge limitations or to the absence of knowledge necessary to generate an appropriate decision. This suggests that strategic decision networks not only need to be able to express and interpret knowledge but also to have access to heterogeneous knowledge that arises from the presence of identity group heterogeneity in these networks.

Expression and interpretation of knowledge suggests that these firms do not lose knowledge from the lack of absorption capabilities. These firms, however, tend to lose knowledge when the knowledge that enters the network is relatively similar to that which has already been absorbed by the network or when knowledge that is unfamiliar to the network doesn’t enter the network. It is expression and interpretation that, when coupled with the presence of heterogeneous knowledge, leads to the absorption of heterogeneous knowledge by the network when making strategic decisions.
Proposition 6: A learning organization paradigm is unrelated to heterogeneous knowledge presence and positively related to heterogeneous knowledge expression and interpretation.

RESEARCH IMPLICATIONS

Future research needs to address the role of intra-firm networks in knowledge transmission and capability building. This model demonstrates that collaborative networks within organizations are increasingly important for firms when knowledge is a critical component of their performance. Researchers and practitioners have embraced network structures related to international, entrepreneurial and innovative ventures (Miles & Snow, 1995; Peng & Heath, 1996; Podolny & Stuart, 1994). Inter-firm alliances typically occur in these situations when there are significant knowledge and capability gaps and when the transactional costs of these resources are lower to access externally than they are to develop internally. While this research indicates that network structures facilitate effective knowledge and capability transmission, little theoretical and practical attention has been given to the role of intra-firm networks in these areas.

This model demonstrates that the structure of the network depends on the nature of the knowledge that is transmitted. Identifying the benefits of the knowledge content and flow is critical in determining the form that network structures take within firms. Sharing tacit knowledge related to identity group experiences so it can be utilized when making strategic decisions is a personal matter. For personal knowledge to be shared, strong network ties are required. A network composed of many weak, non-redundant ties provide the linkages that enable firms to access new knowledge, but it isn’t likely that members will be willing to share
knowledge related to their personal experiences with people they don’t know well. A degree of redundancy in network ties may also be required for tacit knowledge to be interpreted in social exchanges since its transmission into strategic decision may involve repeated discussions in a number of different settings. Since the content and flow of knowledge depends on the nature of the network task, it is likely to influence the form that intra-firm networks take.

Zahra and George (2002) suggest that future research may benefit from a study of specific practices that facilitate the acquisition, assimilation, transformation and exploitation of knowledge. The concept of heterogeneous knowledge absorption practices is an attempt to describe how such practices relate to specific dimensions of ACAP and demonstrate how these practices interrelate to each other. The theoretical model focuses on complementary knowledge sources, activation triggers and social integration mechanisms to demonstrate how potential can be translated into realized knowledge absorption capacities. Further research that investigates the relationship of these constructs with firm-level operating paradigms may shed more light on how management practices and operating paradigms facilitate or inhibit absorption capacities.

The concept of heterogeneous knowledge absorption practices contributes to the growing body of literature on dynamic organizational capabilities (Teece, Pisano, & Schuen, 1997; Winter, 2000) by unraveling the process in which tacit knowledge can improve competitive performance. The use of heterogeneous knowledge absorption practices during strategic decision-making extends the work of Eisenhardt and Martin (2000) by illustrating that these practices may create strategic maneuverability advantages through a process in which strategic decision networks can reconfigure knowledge resources as environmental conditions change.

Future research could also benefit from evaluating the relationship between heterogeneous knowledge absorption practices and strategy process models. There are two
traditional approaches to strategy process; synoptic and incremental (Fredrickson, 1983). This typology is based on the tension between making decisions based on pre-defined criteria and allowing decisions to unfold from ongoing circumstances. Unfolding decisions may restrict the amount of relevant knowledge that is considered when making strategic decisions when conditions may call for a more complete understanding of diverse operating realities. On the other hand, difficulties in understanding a multiplicity of critical context-specific decision variables or determining the causal relationships among them may hinder the firm’s ability to attain pre-established goals by increasing the complexity of decision criteria and with it decision uncertainty. It may be helpful to understanding the impact that knowledge absorption has on these two strategy processes.

Previous theoretical arguments (Barney & Zajac, 1994; Lepak & Snell, 1999) and empirical research (Hitt, Hoskinsson, & Kim, 2001; Pennings, Lee & van Witteloostuijn, 1998) on human capital as a strategic resource demonstrate that the direct and indirect effects of human capital determine the degree to which firms can attain human resources advantages. The model provides further understanding on how organizational constructs may moderate the relationship between human capital and strategic performance. Future research on the direction and magnitude of these effects could enhance understanding of the role of human capital in creating value for firms.

Finally, the model constitutes a paradigm shift for workforce heterogeneity. Instead of viewing workforce heterogeneity as a negative construct that requires the removal of the conditions under which disadvantage occurs, the model examines workforce heterogeneity from a resource advantage perspective, essential to providing the firm with new knowledge contributions that arise from positive outlier tendencies (i.e. perspectives, cognitive resources,
problem solving abilities, social skills, etc.) associated with unique identity group experiences. In this light, the focus of workforce heterogeneity research shifts from a disadvantage to an advantage construct and establishes a theoretical framework for further exploration of the processes associated with translating workforce heterogeneity into firm performance.

CONCLUSION

This paper is a response to the call for organizational constructs (Pfeffer, 1994; Williams & O’Reilly, 1998) to study the translation of workforce heterogeneity into firm performance by identifying two organization-level constructs that moderate the relationship between workforce heterogeneity and firm performance. The model also explains why previous research endorses two conflicting hypotheses. It posits that it is possible for the value in diversity and ineffective workgroup functioning hypotheses to coexist since each of these effects arises from different absorption practices. Heterogeneous knowledge expression has been proposed to facilitate the network’s generation of diverse perspectives, cognitive resources and problem solving approaches that have been shown to lead to higher quality decisions (Cox, 1993; MeLead, Lobel, & Cox, 1996; Watson, Kumar, & Michaelsen, 1993). The absence of heterogeneous knowledge interpretation has been suggested to be the reason for the problems with informal communication (Jackson et al., 1991) and social integration (Smith et al., 1994). The model suggests that solution to these problems may be better addressed by shifting the focus to power configurations, trust building and collaborative knowledge-sharing and to firm-level operating paradigms that affect the type of and degree to which heterogeneous knowledge is available for strategic decision purposes.
REFERENCES


Zahra, S. A., Ireland, & Hitt, M. 2000. International expansion by new venture firms:

International diversity, mode of market entry, technological learning, and performance.

Previous Research on Decision Process
Outcomes of Workforce Heterogeneity

Figure 1

- Workforce Heterogeneity
  - (+) Cognitive Skills
  - (+) Perspectives
  - (+) Problem Solving
  - (-) Social Integration
  - (-) Informal Communication
A Process Model of the Translation of Workforce Heterogeneity into Firm Performance

Figure 2

Strategic Paradigms
• Shared Values
• Diversification
• Learning Organization

Workforce Heterogeneity ➔ Strategic Decision Network ➔ Firm Performance

Knowledge Absorption Practices
• Presence
• Expression
• Interpretation
Heterogeneous Knowledge Translation Process in the Formation of Strategic Decisions

Figure 3
The University of Rhode Island is one of eight land, urban, and sea grant universities in the United States. The 1,200-acre rural campus is less than ten miles from Narragansett Bay and highlights its traditions of natural resource, marine and urban related research. There are over 14,000 undergraduate and graduate students enrolled in seven degree-granting colleges representing 48 states and the District of Columbia. More than 500 international students represent 59 different countries. Eighteen percent of the freshman class graduated in the top ten percent of their high school classes. The teaching and research faculty numbers over 600 and the University offers 101 undergraduate programs and 86 advanced degree programs. URI students have received Rhodes, Fulbright, Truman, Goldwater, and Udall scholarships. There are over 80,000 active alumnae.

The University of Rhode Island started to offer undergraduate business administration courses in 1923. In 1962, the MBA program was introduced and the PhD program began in the mid 1980s. The College of Business Administration is accredited by The AACSB International - The Association to Advance Collegiate Schools of Business in 1969. The College of Business enrolls over 1400 undergraduate students and more than 300 graduate students.

**Mission**

Our responsibility is to provide strong academic programs that instill excellence, confidence and strong leadership skills in our graduates. Our aim is to (1) promote critical and independent thinking, (2) foster personal responsibility and (3) develop students whose performance and commitment mark them as leaders contributing to the business community and society. The College will serve as a center for business scholarship, creative research and outreach activities to the citizens and institutions of the State of Rhode Island as well as the regional, national and international communities.

The creation of this working paper series has been funded by an endowment established by William A. Orme, URI College of Business Administration, Class of 1949 and former head of the General Electric Foundation. This working paper series is intended to permit faculty members to obtain feedback on research activities before the research is submitted to academic and professional journals and professional associations for presentations.

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