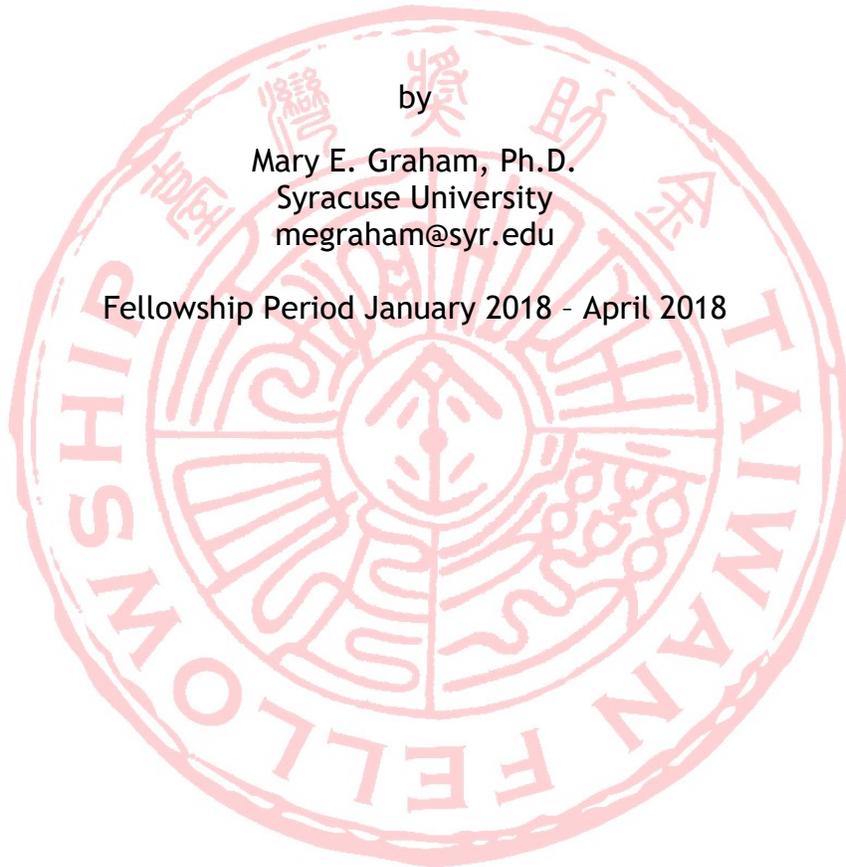**Final Report to the Taiwan Fellowship Office**

Human Resource Management in Manufacturing Supply Chains:

A Cross-Cultural Examination

by

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Fellowship Period January 2018 – April 2018

Summary (excerpt from original proposal)

"I am requesting funds to conduct research with colleagues in Taiwan for three months. The research topic is the influence of human resource management (HR) strategy on firm outcomes, in the context of buyer-supplier relationships in the manufacturing industry. I am proposing collaboration on this research with Dr. Meiyu Fang, Professor of Management at National Central University in Zhongli and Dr. Ying-Jung Yeh, Associate Professor and director of the global MBA program at National Taiwan University of Science and Technology (NTUST) in Taipei, both of whom are accomplished management scholars. Using theories of intra- and inter-firm strategic human resource management, cross-cultural management models, and multiple research methods, our team will extend to the Taiwan context research a model that compares the use of three HR strategies: internally-oriented high performance work systems (HPWS), externally-oriented HPWS, and collaborative HR practices. My time in Taiwan will be spent working with my Taiwanese colleagues to learn about manufacturing and management culture in Taiwan, and to design and conduct qualitative interviews of HR managers, procurement professionals, and plant managers. The ultimate goal of this research project is an empirical, mixed method, three-country (France, Taiwan, the United States) examination of a model of supply chain / HR management relationships."

Work Plan and Results

In my Taiwan Fellowship application, I proposed several objectives to accomplish in Taiwan. I performed these activities January 21 to April 30, 2018.

Objective 1. I worked closely with my colleagues Dr. Fang and Dr. Yeh in Taiwan to finalize the conceptual model for the study and receive Syracuse University Institutional Review Board (IRB) approval for the study. The literature review in Dr. Graham's fellowship proposal served as the research foundation:

"Today's firms are concerned not only with managing their own employees but also with the management and qualifications of the workers of its business partners, such as other companies in their supply chains. This shift suggests a potentially new form of HR-based competitive advantage, available to firms who strategically manage their human resources both internally and externally. Unfortunately, strategic human resource management research has not kept pace with these new work processes, and with the management of workers who are "external" to the firm. At the same time there has been insufficient attention to the use of strategic human resource management in the supply chain literature [a supply chain is "the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer" (Christopher, 1998)]. In our study, we propose to address these gaps by collecting survey data from manufacturing firms regarding the management of their own employees and the workers of their key suppliers.

Qualitative case studies of the efficacy of human resource management for enhancing firm performance suggest positive effects from considering and aligning the people management activities of supply chain partners (Koulikoff-

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Souviron and Harrison, 2007; Marchington et al., 2011; Scarbrough, 2000). However, there is a need for qualitative work in a wider variety of countries and contexts, as well as theory-based quantitative studies. Fortunately, there is a growing theoretical literature in the strategic human resource management field that focuses on leveraging external value, or creating value jointly, with other organizations (Fisher, Graham, Vachon, and Vereecke, 2010; Lengnick-Hall et al., 2012; Lepak and Snell, 1999). Based upon this literature, my French colleagues and I have conceptualized three types of HR strategy: the *high performance work systems (HPWS)* used by buyer firms to manage their own employees in all aspects of their performance (e.g., Combs et al., 2006); *externally-oriented HPWS* implemented by buyer firms to encourage their manufacturing plant employees to work cooperatively and effectively with strategic suppliers (e.g., Chuang and Liao (2010); and *collaborative HR practices*, or practices implemented by buyer and supplier firms in order to create a fit between their HR systems (e.g., Koulikoff-Souviron and Harrison, 2007; Marchington et al., 2011). The primary research question is, "Do HR strategies enhance the link between supply chain (SC) strategy (i.e., degree of relationship closeness between buyers and suppliers) and firm operational, innovation, and financial performance?"

For the research in Taiwan, we relied heavily on the Claye-Puaux, Graham, and Koulikoff-Souviron (2013) model, depicted below:

THEORETICAL MODEL
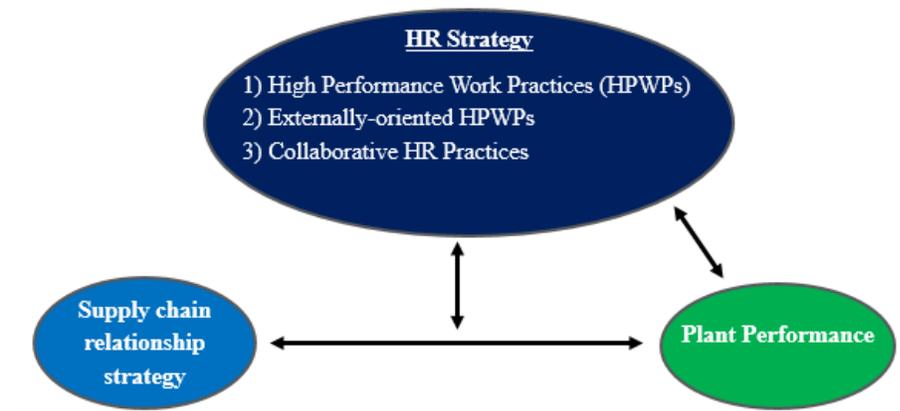
Dr. Fang, Dr. Yeh, and Dr. Graham made a practical decision to observe cultural differences across countries as they emerged from our in-person survey administrations and discussions with study participants. In preparation, we discussed extensively how human resource management (HRM) in the United States might be expected to differ from HRM in supply chains in Taiwan due to cultural differences between the two countries. A starting point was Hofstede's country culture dimensions (Hofstede, 2001) as updated by his continuing work on the subject (see https://www.hofstede-insights.com). The Appendix of this report defines and explains the six cultural dimensions. According to Hofstede's research group, the following is a cultural comparison of the U.S. and Taiwan on six cultural dimensions (https://www.hofstede-insights.com/product/compare-countries/):

Taiwan ×   United States ×
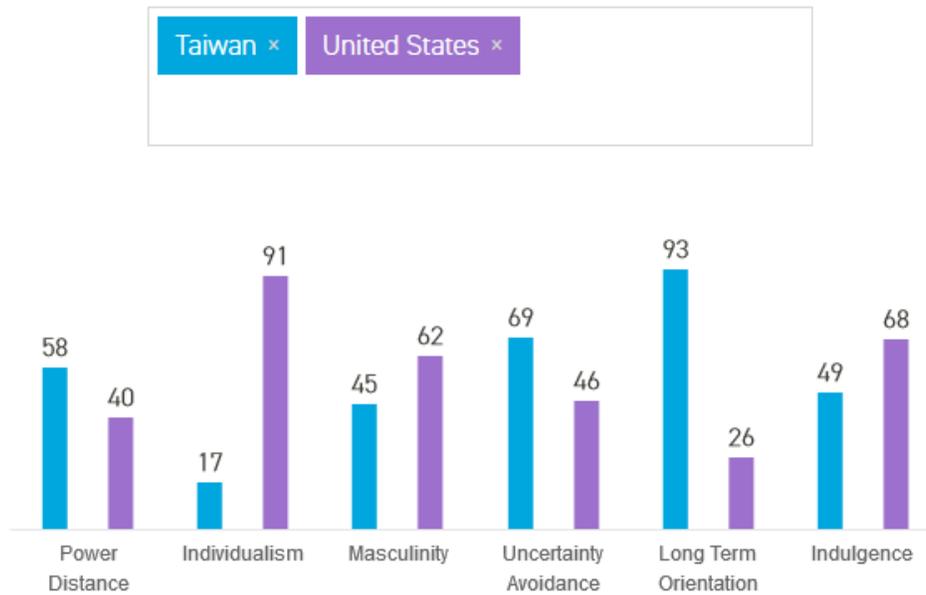
We believe that the cultural differences between Taiwan and the U.S. have the potential to affect the supply chain relationship strategy between buyers and suppliers, and the degree of adoption of focused and collaborative HR strategies. Supply chain relationship strategy refers to the closeness of the relationship between buyers and suppliers in terms of the integration of systems and their long-term commitment to the relationship. The culture in Taiwan is more collectivistic than in the United States, with Taiwanese managers being more likely to consider the needs of the entire firm and supply chain than their U.S. counterparts. Therefore, we expect closer relationships between buyers and suppliers in Taiwan, all else equal. This highlights the importance of supplemental qualitative information on the relationship between buyers and suppliers to augment the quantitative scales in our study. A more collectivist culture also might suggest a closer relationship between the supply chain and HR functions within firms, perhaps necessitating a two-way arrow between Supply Chain Relationship Strategy and HR Strategy in the model. Finally,

the more collectivist culture of Taiwan may be reflected in initial evidence that procurement may be a more centralized function in Taiwan as compared to the United States, so that plant managers do not necessarily handle purchasing. This necessitates a re-thinking of the model in terms of the unit of analysis (i.e., plant versus company) and the practical aspects of finding the best informants to provide plant-level information.

Long-term versus short-term orientation is the other major cultural difference between Taiwan and the United States. This dimension is a bit more complex, with a low long-term orientation indicating a strong commitment to current country norms and a strong long-term orientation indicating adaptable behavior where practical. Arguably, close and cooperative supply chain relationships and two of the HR strategies we are examining – focused HR practices and collaborative HR practices – are breaking norms of transactional market relations between buyers and suppliers. To the extent that Taiwan is more open to these innovations, we might expect to see closer buyer-supplier relationships and greater use of outward-facing HR practices.

Dr. Graham received Institutional Review Board approval from Syracuse University to conduct the research described in this proposal (IRB approval #18-009). As part of the approval process, Dr. Fang and Dr. Yeh completing Collaborative Institutional Training Initiative (CITI) course (https://about.citiprogram.org/en/homepage/) on working with human subjects.

Objective 2. Dr. Fang, Dr. Yeh, and Dr. Graham finalized an electronic survey that was piloted at four manufacturing sites, given in person to one HR manager and one plant/procurement manager per site. The focus of the survey interviews was on the

relationships between plant managers, HR managers, procurement professionals and the suppliers with which they work. We also allowed time for respondent feedback on and questions about the survey items.

We designed two separate surveys – one for plant/procurement managers and one for plant-level HR managers. Each survey was designed to stand alone and covered the following topics:

a. Consent forms in English and Mandarin Chinese.

b. Supply chain relationship strategy. Sample item (5-point strongly disagree to strongly agree scale): To what extent does the following statement describe your plant strategy as it pertains to its relationship with key suppliers? To foster mutual trust and respect with our key suppliers.

c. Plant performance. Sample item (5-point scale, much worse to much better): Rate your plant's performance relative to competitor plants in calendar year 2017. Financial performance, net profits, etc.

d. HR function. Sample item (5-point strongly disagree to strongly agree scale): The HR function in my company operates as an internal business partner.

e. High performance work system practices. Sample item (5-point strongly disagree to strongly agree scale): My plant is considered to be a good place to work.

f. Focused HR practices. Sample item (5-point strongly disagree to strongly agree scale): My plant's employees participate in cross-functional groups within the plant.

g. Collaborative HR practices. Sample item (5-point strongly disagree to strongly agree scale): My plant's leadership communicates with the leadership of key suppliers.

h. Respondent and plant background information. For example, demographics, plant size, product lines.

Objective 2 (continued). Dr. Fang, Dr. Yeh and Dr. Graham scheduled and visited four manufacturing sites and conducted survey-based interviews with managers. On average, we spent three hours at each site, and we interviewed a total of eight respondents. The results of the research are presented in the *Research Findings* section later in the paper. Table 1 summarizes the firms we visited.

Table 1. Pilot Test Sites

Firm	Primary Product	Number of Key Suppliers	HR Manager Title	Plant Manager Title
1	Vehicle Frames	15	HR Manager	Procurement Manager
2	Wafers	100	Senior HR Manager	Supply Chain Manager
3	Microchips	50	Manager	Director of Operations
4	Connectors and cables	20	Director	Manager

Objective 3. A final goal of Dr. Graham's proposal was to live, travel, and meet new colleagues in Taiwan for a period of three months, in order to be introduced to the culture and norms of Taiwan. Dr. Graham lived in the Da'an Park neighborhood of

Taipei where she and her family became friendly with neighbors, shop owners, and the Shida night market vendors. Dr. Graham and her family traveled extensively in Taiwan, including to Kaosiung, Keelung, Jiufen, Yilan, and Zhongli, and learned a great deal about the culture, economic activity, political issues, and history of Taiwan.

Dr. Graham interacted with students and faculty at National Taiwan University of Science and Technology, including the following:

a) A meeting with the Dean and administrators.

b) Two guest lectures in the MBA course of Dr. Yeh.

c) A picnic outing with the MBA students of Dr. Yeh.

Dr. Graham also interacted with students and faculty at National Central University, including the following:

a) A research talk to Ph.D. students and faculty.

b) A guest lecture in the MBA class of Dr. Fang.

c) A student luncheon with MBA students of Dr. Fang and their corporate mentors.

Research Findings

Overview

This is a multi-stage research project that we will be conducted in the United States, Taiwan, and France. The research in Taiwan served to refine the conceptual model and to test the survey instrument with eight managers in Taiwan manufacturing plants. Previously, Dr. Graham conducted a pilot test in the United States with managers of manufacturing firms. These data will be reported in comparison to the

Taiwan pilot test. In addition, substantial previous work on the model and on the survey was done by French scholars Dr. Marie Koulikoff-Souviron and Dr. Sophie Claye-Puaux. A data collection in France may be done in the future.

Descriptive statistics and observations – Taiwan Pilot Study

Dr. Graham and colleagues collected data from eight managers of four manufacturing plants, using an electronic survey. Study participants were recruited to the study by Dr. Fang and Dr. Yeh from their business contacts and former students, following the guidelines in the Syracuse IRB proposal. The survey was primarily quantitative in nature and yielded descriptive statistics on the constructs of supply chain relationship strategy, HR strategy, firm performance, and control variables, all of which are necessary to examine empirically the proposed theoretical model. Because the data collection in Taiwan was a pilot test of a small number of respondents, we do not examine these relationships in the data. Instead, in Table 2 we present descriptive statistics on our key constructs.

Table 2. Descriptive Statistics – Taiwan Pilot Test

	HR Manager Average (Std. Dev.)	Plant Manager Average (Std. Dev.)	Combined Average (Std. Dev.)
Supply Chain Relationship Strategy	4.19 (.38)	4.56 (.38)	4.38 (.38)
Plant Performance scale	3.51 (.60)	3.13 (.87)	3.32 (.73)
Plant Performance:	n/a		n/a
Percent Return on Investment		13% (25%)	
Profits Before Tax as a % of Sales		16% (26%)	
Sales Growth Percent		14% (25%)	
Supplier Positive Contribution to Plant Performance	n/a	3.20 (.35)	n/a
Role of the HR Function in the Firm	4.06 (.13)	4.17 (.58)	4.11 (.35)
High Performance Work Practices	3.77 (.65)	3.31 (.90)	3.54 (.77)
Focused HR Practices	3.53 (.42)	3.94 (.46)	3.73 (.44)
Collaborative HR Practices	3.54 (.53)	4.03 (.74)	3.78 (.64)
Number of pilot survey respondents	4	4	8

Note 1: For all scales except Plant Performance and Supplier Contribution to Plant Performance, survey participants responded to statements using a 5-point scale (1=strongly disagree ... 5=strongly agree).

Note 2: Participants responded to Plant Performance survey items, relative to competitors, using a 5-point scale (1=much worse ... 5=much better).

Note 3: Participants reported Key Supplier Positive Contributions to Plant Performance using a 5-point scale (1=almost none ... 5=very high).

Several observations can be made about the descriptive statistics in Table 2. First, the firms we visited reported employing a strong, close, and long-term relationship strategy with their key suppliers. Self-reported plant performance was moderate, but there was substantial variation in performance across the four firms. The human resources management function in the firms seems to function as an internal business partner, although we would have expected higher scores on high performance work practices if this was the case. Focused HR practices and collaborative HR practices appeared to be employed to the same extent as the high performance work practices, in contrast to the result for the U.S. companies. Put differently, Taiwan firms, as expected, utilized focused HR practices and collaborative HR practices to a greater extent than in the U.S. Table 3 displays this comparison, although we urge caution in drawing conclusions due to the small sample size and uncertainty regarding the representativeness of the samples in each country.

Table 3. HR Strategies Used by Taiwan versus U.S. Firms

	Taiwan Firms (n=4)	U.S. Firms (n=26 or 33)*
High Performance Work Practices	3.54 (.77)	3.57 (.93)
Focused HR Practices	3.73 (.44)	2.89 (1.00)
Collaborative HR Practices	3.78 (.64)	2.32 (.90)

*Note 1: The High Performance Work statistics reflect the responses of HR managers from 26 firms. The Collaborative HR Practices statistics reflect the responses of Plant managers from 33 firms.

Examination of the statistics on the individual survey items comprising the HR indexes (i.e., high performance work practices, focused HR practices, and collaborative HR practices) revealed which activities were most common in each country. Firms from Taiwan and the U.S. reported the greatest commonality in the use of focused HR practices. Table 4 presents this information by country.

Table 4. HR Strategy Details by Country

Practices Emphasized, by Category	Taiwan Firms (n=4)	U.S. Firms (n=26 or 33)*
High Performance Work Practices	• Promotion opportunities • Employment security • Pay for performance	• Internal promotion • Use of orientation programs • Placing high priority on job candidates' ability to learn

Focused HR Practices	• Participation in internal cross-functional teams • Supporting employees with the necessary equipment and resources • Working with key suppliers is a performance expectation	• Supporting employees with the necessary equipment and resources • Participation in internal cross-functional teams • Performance appraisals assess employees ability to work with key suppliers
Collaborative HR Practices	• Frequent interaction between buyer and supplier personnel • Communication between leadership of buyers and suppliers • Cross-functional teams with suppliers' employees • When HR practices of buyers and suppliers conflict, they will discuss the matter.	• Frequent interaction between buyer and supplier personnel • Using industry-standardized jobs • Cross-functional teams with suppliers' employees

*Note 1: The High Performance Work statistics reflect the responses of HR managers from 26 firms. The Collaborative HR Practices statistics reflect the responses of Plant managers from 33 firms.

We had also expected a difference in the supply chain relationship strategy across the two countries based upon the more collectivist culture of Taiwan and its longer-term orientation, as compared to the United States. The procurement managers from Taiwan reported a much closer supply chain relationship strategy with key suppliers (M=4.56, SD=.38) than did their U.S. counterparts (M=3.58, SD=.44). Again, this finding is from small, not necessarily representative samples, but provides an initial indication that differences between the two countries may exist.

Pilot Test Insights

One purpose of conducting a pilot test of surveys for HR Managers and Procurement Managers in manufacturing plants in Taiwan was to identify and correct problems with the survey and any of our assumptions, prior to conducting a full-scale study. We learned a great deal from study participants who were generous with their time in providing feedback on their research experience with us. Based upon their feedback we learned and/or concluded the following:

a. Our English language survey needs to be translated into Mandarin Chinese to enhance survey participant understanding of the survey items and comfort with the survey. For the pilot we had proceeded with only the consent forms available in Mandarin Chinese. Although Dr. Fang and Dr. Yeh assisted survey-takers where the English survey was not understandable, this is not sustainable for a large-scale study.

b. Perhaps relatedly, study participants identified several places where wording was not clear. For example, multiple people had difficulty with the word "discretion" and we found that substituting the word "flexibility" made the survey item more understandable. Study participants found other terminology confusing, and we learned that we will need to avoid academic jargon (e.g., HR strategy; Best practices) or find a way to embed definitions into the survey.

c. A couple of research participants in Taiwan requested guidance on whether to report "actual" plant performance because their management expected

them to be "humble." We explained that we were looking for accuracy, and now plan to guidance on this topic to the instructions.

d. Similarly, some survey respondents felt "bad" that their firms were not doing more of what the survey items described. For example, not many firms required their key suppliers to conduct their HR practices in a certain way, but it was important to the study to ask this question. We plan to add a note explaining that we do not expect that firms will necessarily do all or even any of the activities asked about.

e. Three of the firms we visited were key suppliers to large multinational companies. Going forward, we will need to account for this in drawing the sample of firms and by adding survey questions on this topic. Relatedly, one respondent made the case that it matters the type of supply chain in which the firm is situated (e.g., simple vs. complex).

f. We received several excellent suggestions on other issues to consider, including the complexity of work arrangements in Taiwan (permanent employees, contract employees, foreign guest workers), membership in key supplier associations, firm ownership structure, and worker treatment and labor standards.

Next Steps

The research team of Dr. Fang, Dr. Yeh, and Dr. Graham plan a theoretical paper on HR strategy in supply chains, conceptualizing and explaining the three types of HR strategies: high performance work practices, focused HR practices, and

collaborative HR practices. A central feature of the paper will be consideration of country culture, informed by the pilot test results from Taiwan and the United States. This work will build upon the previous work of Dr. Sophie Claye-Puaux and Dr. Marie Koulikoff-Souviron and will likely include consideration of the French context.

The research team also needs to develop a research strategy for a comparative study of Taiwan and the United States. This will include several key decisions, including the following:

a. How to handle the different supply chain and human resource management structures in the two countries;

b. How to ensure comparable sampling of firms in terms of industry and the nature of the supply chains in which buyer firms are embedded;

c. Where to locate large, reliable databases of firms and key informants in manufacturing supply chains, to whom survey invitations could be sent.

d. Where to apply for research funding to cover the costs of purchasing a database, survey administration, and data analysis.

Conclusion

The Taiwan fellowship provided to Dr. Mary E. Graham permitted the formation of a Taiwan – U.S. research partnership between Dr. Graham of Syracuse University, Dr. Fang of National Central University, and Dr. Yeh of National Taiwan University of Science and Technology. The fellowship supported progress on the development of a cross-cultural theoretical model of human resource management strategy in buyer-supplier relationships, and on-site pilot tests of two surveys in Taiwan manufacturing firms.
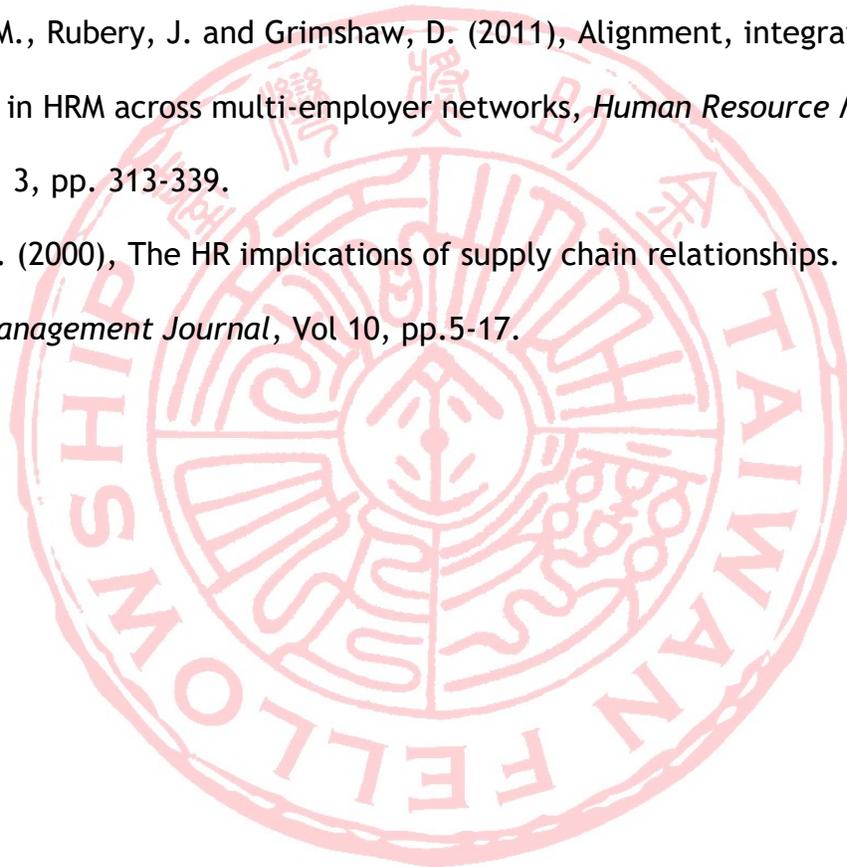
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Appendix – Dimensions of National Culture

The following material is from the source:
https://www.hofstede-insights.com/models/national-culture/

The Hofstede model of national culture consists of six dimensions. The cultural dimensions represent independent preferences for one state of affairs over another that distinguish countries (rather than individuals) from each other.

The country scores on the dimensions are relative, in that we are all human and simultaneously we are all unique. In other words, culture can only be used meaningfully by comparison. The model consists of the following dimensions:

Power Distance Index (PDI)

This dimension expresses the degree to which the less powerful members of a society accept and expect that power is distributed unequally. The fundamental issue here is how a society handles inequalities among people.

People in societies exhibiting a large degree of Power Distance accept a hierarchical order in which everybody has a place and which needs no further justification. In societies with low Power Distance, people strive to equalise the distribution of power and demand justification for inequalities of power.

Individualism versus Collectivism (IDV)

The high side of this dimension, called Individualism, can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families.

Its opposite, Collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular ingroup to look after them in exchange for unquestioning loyalty. A society's position on this dimension is reflected in whether people's self-image is defined in terms of "I" or "we."

Masculinity versus Femininity (MAS)

The Masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness, and material rewards for success. Society at large is more competitive. Its opposite, Femininity, stands for a preference for cooperation, modesty, caring for the weak and quality of life. Society at large is more consensus-oriented.

In the business context Masculinity versus Femininity is sometimes also related to as "tough versus tender" cultures.

Uncertainty Avoidance Index (UAI)

The Uncertainty Avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen?

Countries exhibiting strong UAI maintain rigid codes of belief and behaviour, and are intolerant of unorthodox behaviour and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles.

Long Term Orientation versus Short Term Normative Orientation (LTO)

Every society has to maintain some links with its own past while dealing with the challenges of the present and the future. Societies prioritize these two existential goals differently.

Societies who score low on this dimension, for example, prefer to maintain time-honoured traditions and norms while viewing societal change with suspicion.

Those with a culture which scores high, on the other hand, take a more pragmatic approach: they encourage thrift and efforts in modern education as a way to prepare for the future.

In the business context, this dimension is referred to as "(short-term) normative versus (long-term) pragmatic" (PRA). In the academic environment, the terminology Monumentalism versus Flexhumility is sometimes also used.

Indulgence versus Restraint (IND)

Indulgence stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint stands for a society that suppresses gratification of needs and regulates it by means of strict social norms.