



NATIONAL CULTURE AND THE PREFERENCE FOR MANAGEMENT CONTROLS: AN EXPLORATORY STUDY OF THE FIRM-LABOR MARKET INTERFACE*

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Abstract

This study uses Hofstede's taxonomy of work-related national cultural dimensions to analyze preferences for specific management controls at the interface between the organization and the external labor market. Four experiments were conducted with samples of last-semester Japanese and U.S. MBA students. Most of the results did not provide support for the four hypotheses. These findings are used as the basis for suggesting potential directions for future empirical refinements and theory construction.

With the accelerating globalization of business, the extent to which any particular management control can be effectively used in different countries has become an increasingly important issue. This issue has arisen because much evidence exists that people from different countries have diverse work-related national cultures (Adler *et al.*, 1986; Hofstede, 1980, 1991; Kagitcibasi & Berry, 1989; Laurent, 1983), and that people of different cultural origins have different attitudes toward, or reactions to, the same management controls (Birnberg & Snodgrass, 1988; Chow *et al.*, 1991b; Daley *et al.*, 1985; Harrison, 1992; Horovitz, 1980; Kreder & Zeller, 1988). These cultural differ-

ences suggest that management controls which are effective in one country may be ineffective, or even dysfunctional, in another. Such cross-cultural differences can arise both internally (e.g. by affecting the work-related behavior of a given set of employees) and at the interface between the organization and the external labor market (e.g. attracting and retaining employees).

A large number of empirical studies have examined relationships between national culture and various aspects of management (e.g. long-range planning, strategic decision making). However, only a few have specifically focused on the relation between national culture and employees' attitudes toward, or reactions to,

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basis for predicting differences between Japanese and U.S. nationals' preferences for management controls.

Prior to developing such predictions, three potential concerns regarding Hofstede's cultural dimensions should be addressed. First, since Hofstede's cultural scores were obtained in the 1970s, their continued applicability to Japan and the U.S. in the 1990s may be open to question. Second, most of Hofstede's subjects were employed by the same firm, and his culture scores may have been confounded by firm-specific factors, such as industry, size and corporate culture. Third, Hofstede's definition of the cultural dimensions may be biased because they are a product of Western culture and thinking.

While it may not be possible to prove conclusively the validity of Hofstede's taxonomy, there is evidence to suggest its applicability to the current study. Specifically relating to Hofstede's cultural dimensions, two studies have collected more recent data from more diverse subjects and using different instruments than that of Hofstede (1980). In a study of subjects from nine Asian and Pacific countries, Ng *et al.* (1982) obtained culture measures using an instrument (the Rokeach Value Survey) designed for assessing values in the U.S. For the six countries in their sample which overlapped those of Hofstede (1980), four discriminant function scores were obtained. Three of these scores were significantly correlated with Hofstede's four cultural dimensions (Hofstede & Bond, 1984). Another validation of Hofstede's taxonomy used an instrument which was based on Asian culture and thinking (Chinese Culture Connection, 1987). This instrument was developed by a sequential process of analyzing the Asian literature on work and culture, and surveying respected researchers on Asian culture. Data then were collected from university students from 22 countries (both Asian and Western) who had work experience. These data yielded a four-dimensional model in which three dimensions significantly correlated with three of Hofstede's dimensions: individualism, power distance, and masculinity.

Other studies have reported findings which corroborated Hofstede's taxonomy in the case of individualism vs collectivism. Students of Japanese culture have emphasized Japanese individuals' tendency to place the interests of the collective over those of the self (Befu, 1980; Kamata, 1982; Morsbach, 1980; Ouchi, 1981; Reischauer, 1977; Smith, 1983). Despite Japan's tremendous economic and technological advances in recent years, it has exhibited no discernible change in such basic values (Trommsdorff, 1983, 1985). In contrast to the Japanese' collectivistic culture, the individualistic motive has been identified as the cornerstone of U.S. world view and management theories (Harris & Moran, 1987; Locke & Latham, 1984; Mitchell, 1974; Sampson, 1977; Spence, 1985).

Finally, Ronen & Shenkar (1985) have reviewed eight studies which had used attitudinal data to cluster countries (including Hofstede, 1980, and a related, earlier work, Hofstede, 1976). Substantial overlap was found to exist between Hofstede's clusters and those of the other studies.

Related prior studies

Four prior empirical studies on management controls are of particular relevance to this study. All four have examined national differences in attitudes toward, or reactions to, management controls. Two of these have involved a comparison between Japan and the U.S.

Daley *et al.* (1985) surveyed Japanese and U.S. divisional managers and corporate controllers in the 500 largest corporations in each country. For each type of employee, the Japanese and U.S. respondents' attitudes toward 35 aspects of a management control system were obtained. Comparing the attitudes of the Japanese and U.S. respondents towards these 35 aspects, 27 (25) of the controllers' (managers') responses were statistically significantly different. Of particular relevance to this study, Daley *et al.* (1985) found that the U.S. respondents agreed more with the use of controllability filters, purchase autonomy (a type of decentralization), slack in budgets (standard difficulty), expressing budget goals in monetary terms, top-

down (as opposed to participatively set) budgets, and using budgets to evaluate performance. The Japanese respondents, however, agreed more with using budgets to communicate goals, and less with budget-contingent compensation. Overall, Daley *et al.* (1985) have increased the level of understanding about Japanese and U.S. managers' attitudes toward the components of a management control system. However, since this study lacked an explicit theoretical cultural framework and its results were largely inconsistent with expectations (findings for seven of the ten stated directional expectations were contrary to predictions), it provides no clear basis for developing expectations in the current study.

In contrast, Birnberg & Snodgrass (1988) focused on three functions of a management control system (monitoring, evaluating, rewarding) and based their empirical analysis on a variety of anthropological and sociological studies. Data were collected from 1051 managers and workers in 22 large Japanese and U.S. firms. The results indicated that the Japanese managers and workers had more similar values about monitoring and evaluating than did the U.S. managers and workers. However, when considering rewarding, the U.S. respondents were more homogeneous than the Japanese. Birnberg & Snodgrass (1988) also found that the Japanese firms had more implicit or informal control systems while the U.S. firms had more explicit or formal control systems. Finally, the Japanese respondents were found to view their control systems as being more explicit in disseminating information, while the U.S. respondents saw their control systems as being more explicit in defining roles. For the purposes of the current study, while the Birnberg & Snodgrass (1988) results are driven by theory, their focus on aggregated functions of a control system does not provide much guidance for examining specific control system components.

Chow *et al.* (1991b) applied Hofstede's (1980) taxonomy of national culture to an examination of relationships between components of control systems and national culture. Their laboratory experiment used student sub-

jects from Singapore and the U.S. to test how individualism interacts with two types of control system interdependence (work flow and pay) to affect performance. Overall, the results supported the notion that national culture and management controls have independent, not interactive, effects on performance. While this finding is of interest, a limitation of the Chow *et al.* (1991b) study is that it only examined two control system components.

Finally, Harrison (1992) used Hofstede's (1980) taxonomy to study the moderating effects of participative budgeting on the relationship between performance evaluation style and job-related tension and job satisfaction. He argued that participation is negatively related to power distance and individualism. Since Hofstede (1980, 1983a) reports that most countries have either high power distance and low individualism or low power distance and high individualism, Harrison hypothesized that participation would have the same moderating effect on the relationship between performance evaluation style and job-related tension and job satisfaction for both combinations (high-low and low-high) of these cultural dimensions. Using data obtained from managers from Australia (low power distance and high individualism) and Singapore (high power distance and low individualism), Harrison found that, as predicted, national culture did not affect the moderating effect of participative budgeting. Hence, Harrison's study only provides indirect evidence on the effects of national culture, in addition to being limited to one component of the management control system.

In summary, these prior studies have increased the level of understanding about national differences relating to management controls, but they offer limited guidance for the development of cross-cultural predictions at the level of specific controls.

HYPOTHESIS DEVELOPMENT

This section is organized into three parts. The first briefly describes the 11 components of a

management control system which are included in this study. The second discusses three complications in analyzing the effects of national culture on preferences for these components. It also develops predictions of differences between Japanese and U.S. nationals' preferences for these components. The third part presents four hypotheses which are empirically tested in this study.

Components of a management control system

A management control system has several major functions, including organizing, planning, evaluating and rewarding (Birnberg & Snodgrass, 1988; Flamholtz *et al.*, 1985; Otley, 1980; Rockness & Shields, 1984, 1988). In turn, each of these functions encompasses numerous components. Table 1 lists 11 components of a management control system which span these four major functions. These components have been shown by prior research (see below) to affect beliefs about, or behavioral reactions to, management controls. These 11 components are the focus of this study; they are organized by function and briefly described below.⁴

TABLE 1. Control system and components

Function	Components
Organizing	Environmental uncertainty
	Hierarchy height
	Centralization
	Horizontal interdependency
	Formal rules
Planning	Top-down planning
	Standard difficulty
Evaluating	Controllability filters
	Relative evaluation
Rewarding	Team-based rewards
	Preset pay

Organizing. Environmental uncertainty is a key determinant of how a firm is organized because it affects the extent to which employees possess knowledge about the environment and how to transform inputs into outputs (Gordon & Narayanan, 1984; Govindarajan, 1984; Khandwalla, 1972; Lawrence & Lorsch, 1967; Thompson, 1967). *Hierarchy height* is the number of vertical layers into which the organization is structured (Bruns & Waterhouse, 1975; Otley, 1980; Rockness & Shields, 1984). *Centralization* is the extent to which decision-making authority is retained at higher levels in the hierarchy (Bruns & Waterhouse, 1975; Merchant, 1981). *Horizontal interdependency* is the nature and extent of horizontal resource and information flows among individual employees and/or organizational subunits in discharging their responsibilities (Chenhall & Morris, 1986; Chow *et al.*, 1991b; Hayes, 1977; MacIntosh & Daft, 1987). Finally, *formal rules* are used by many organizations to establish responsibility for, and the methods of, accomplishing work-related activities (Bruns & Waterhouse, 1975; Merchant, 1985; Rockness & Shields, 1984; Waterhouse & Tiessen, 1978).

Planning. Top-down planning is the extent to which employees at lower hierarchical levels are allowed to have input into the development and selection of the plan which they will be held responsible for achieving (Birnberg *et al.*, 1990; Shields & Young, 1993). *Standard difficulty* is the *ex ante* probability that an employee can attain his or her performance plan (Birnberg *et al.*, 1990; Chow, 1983; Merchant & Manzoni, 1989).

Evaluating. A controllability filter adjusts for or eliminates the effects of uncontrollable factors from an employee's performance app-

⁴ The argument can be made that other components of control systems (e.g. subjective vs objective performance evaluation, long-term vs short-term compensation) also are appropriate for inclusion. The current state of the literature is not sufficiently developed to guide the prioritization of specific control system components for inclusion. While we acknowledge that our list of components can be expanded, we maintain that our current list still captures many important aspects of management control systems in general. We decided to limit the number of control components because one of our experiments involved choosing the levels of all the control system components, and prior research has found that a person can simultaneously hold and process in working (i.e. short-term) memory only a limited number of information items (Birnberg & Shields, 1984).

raisals (Demski, 1976; Merchant, 1989). *Relative evaluation* is a specific controllability filter whereby an employee's measured performance is evaluated against that of others who faced similar uncertainty (Janakiraman *et al.*, 1992; Maher, 1987).

Rewarding. Team-based reward is the degree to which an employee's rewards are determined by his or her own performance as opposed to that of a team of employees (Chow *et al.*, 1991a, b). *Preset pay* is periodic pay which is predetermined and not affected by the current period's measured performance (Demski & Feltham, 1978; Waller & Chow, 1985).

Complications in predicting the effects of national culture on preferences for management control components

Three complications arise in analyzing the effects of national culture on preferences for specific control components. First is that for any individual, the four cultural dimensions are operating simultaneously (Hofstede, 1980, 1991). Hence, the (net) preference for any particular control component may be subject to the mutually reinforcing or opposing effects of different cultural dimensions.

The second complication is that, in practice, the various control system components operate simultaneously and can act as substitutes or complements for one another (Chow *et al.*, 1991a; Merchant, 1985; Otley, 1980; Rockness & Shields, 1984). An example of controls acting as substitutes is that an organization can shield employees' rewards from environmental uncertainty by using either controllability filters or a higher proportion of preset pay. An example of complements is a greater use of team-based rewards when interdependency among employees or organizational subunits is high.

Third, the operation of a management control system may involve trade-offs across both control components and objectives. An example of the former is an organization seeking to motivate its employees with a higher proportion

of performance-contingent pay. A side-effect of this approach is increased employee exposure to environmental uncertainty, which may generate demands for higher expected pay as well as efforts to secure easier performance standards. An example of trade-offs among objectives is the use of individual-based rewards. While such rewards can increase employees' work effort, they also can reduce the incentives for cooperative behavior.

Because of these three complications, in general, either the design of an organization's management controls or a potential employee's selection of management controls is more likely to require the simultaneous design of, or choice from, a set of controls, rather than a series of sequential and unrelated designs or choices. However, there do exist decisions which only involve specific management control components. An example is a firm considering modifying a particular aspect of its existing system, or a labor market participant evaluating two competing control packages which are substantially equal in other aspects. In such cases, *ceteris paribus* predictions of univariate differences in preferences may be feasible. The feasibility would depend on whether the control component in question is subject to the influence of only one, or more than one, cultural dimension and, in the latter case, whether the relevant cultural dimensions are reinforcing or opposing.⁵

If the 11 control components are considered individually, then the prior theoretical and empirical literatures do provide some guidance for predicting how Japanese and Americans' preferences for them would differ. Below, these prior literatures are used to derive directional predictions for eight of the 11 control system components. We are unable to derive unambiguous directional predictions for the remaining three components. Each of these is subject to the potentially conflicting influences of multiple cultural dimensions, and there is insufficient guidance from the extent literature to resolve these ambiguities. Table 2 summarizes

⁵ Given the potential for interdependencies among controls, such univariate predictions would necessarily be conditional on the current levels of the other controls.

TABLE 2. Univariate predictions of relative preferences for control system components

Control system function component	Operative national culture dimension(s)	Predicted direction
Organizing		
Environmental uncertainty	Uncertainty avoidance	U.S. > Japan
Hierarchy height	Power distance	Japan > U.S.
Centralization	Power distance	Japan > U.S.
Horizontal interdependency	Individualism	Japan > U.S.
Formal rules	Uncertainty avoidance	Japan > U.S.
Planning		
Top-down planning	Power distance	Japan > U.S.
Standard difficulty	Uncertainty avoidance	U.S. > Japan
	Masculinity	Japan > U.S.
Evaluating		
Controllability filters	Uncertainty avoidance	Japan > U.S.
Relative evaluation	Uncertainty avoidance	Japan > U.S.
	Individualism	U.S. > Japan
Rewarding		
Team-based rewards	Individualism	Japan > U.S.
Preset pay	Masculinity	U.S. > Japan
	Individualism	Japan > U.S.
	Uncertainty avoidance	Japan > U.S.

the directional predictions for the control system components. Each component is labelled such that a higher value denotes a higher preference for it.

Organizing. Because of their higher uncertainty avoidance, the Japanese are predicted to have a lower preference for *environmental uncertainty*. The Japanese are predicted to have

a higher preference for greater *hierarchy height* owing to their higher power distance: a taller hierarchy is a means of visibly establishing seniority relationships and power or status differentials.⁶ The higher power distance of the Japanese also is predicted to produce a higher preference for *centralization* because this would be consistent with power differentials in which individuals higher in the hierarchy would direct those below.⁷ In contrast, Americans are predicted to prefer decentralization as a consequence of their lower power distance.⁸

The preference for, or at least acceptance of, *horizontal interdependency* is predicted to be higher among the Japanese because of their lower individualism (i.e. higher collectivism). Since *formal rules* (e.g. standard operating procedures, policy manuals) provide guidance on how to operate in uncertain situations, the Japanese are predicted to have a higher preference for them owing to their higher uncertainty avoidance.⁹

Planning. The higher power distance of the Japanese leads to the prediction that they would have a higher preference for *top-down planning* (i.e. imposed budgets).¹⁰ However, we are unable to make a directional prediction for *standard difficulty* because of the conflicting influences of two cultural dimensions. The higher uncertainty avoidance of the Japanese would imply a higher preference for easier standards since they are more likely to be

⁶ This prediction is consistent with the analysis of Lincoln *et al.* (1986) and Lincoln & McBride (1987). These prior studies suggested two major reasons why Japanese firms have more vertical layers. First, to accommodate their practice of long-term employment, they need more vertical layers to provide more opportunities for advancement. Second, more vertical layers makes it easier to clearly specify superior-subordinate roles.

⁷ Lincoln *et al.* (1986) and Lincoln & McBride (1987) also predict that relative to U.S. firms, Japanese firms would have higher centralization. However, they distinguish between two types of centralization: formal and de facto. Our analysis focuses on de facto centralization.

⁸ It is of interest to note that Daley *et al.* (1985) also predicted that, relative to the Japanese, the Americans would prefer decentralization (purchase autonomy), but their empirical results indicated the opposite.

⁹ This prediction is consistent with the finding by Lincoln *et al.* (1986) and Lincoln & McBride (1987) that formalization is higher in Japanese than in U.S. firms.

¹⁰ This prediction is contrary to the expectation of Daley *et al.* (1985), though it is consistent with their reported result. It also is of interest that even though this directional prediction is a direct implication of Hofstede's (1980) theory, an opposite prediction is implied by other literature on Japanese management (e.g. Ouchi, 1981; Pucik & Hatvany, 1983). While resolving this conflict is an important research topic, it is beyond the scope of the current study.

achieved. However, the higher masculinity of the Japanese would imply that they would have a higher preference for more challenging standards.¹¹

Evaluating. The Japanese are predicted to have a higher preference for *controllability filters* due to their higher uncertainty avoidance.¹² We are unable to derive a directional prediction regarding preferences for *relative performance evaluation*. To the extent that relative evaluation is a type of controllability filter, the Japanese can be expected to have a higher preference for it. However, relative evaluation also involves interpersonal comparisons and overt competition. This would be inconsistent with the preference of high-collectivism individuals to avoid interpersonal competition and to preserve interpersonal harmony.

Rewarding. The Japanese are predicted to have a higher preference for *team-based rewards* owing to their more collective culture. However, the Japanese and Americans' relative preferences for *preset pay* are subject to the potential influences of three cultural dimensions. While the higher masculinity of the Japanese would suggest a higher preference for proportionally more monetary rewards tied to performance, such rewards tend to introduce or accentuate pay differences across co-workers, which is inconsistent with high-collectivism cultures' preferences for relatively equal pay (Bond *et al.*, 1982). Another potentially relevant cultural dimension is uncertainty avoidance. The Japanese' higher score on this cultural dimension would suggest a higher preference for preset pay to reduce pay uncertainty due to uncontrollable influences on performance.¹³

Hypotheses

This subsection presents four hypotheses for empirical testing. Each of the first three hypotheses focuses on a single control component.

This univariate focus was aimed at avoiding the ambiguities arising out of the interrelationships among control components and the potentially conflicting influences of multiple cultural dimensions. The fourth hypothesis addresses the preference for a set of controls which are subject to the influence of all four cultural dimensions.

Three features of the univariate hypotheses should be noted. First is that they are a subset of the eight directional predictions developed in the preceding subsection. The decision to include only three of these predictions was based on two considerations. One was to keep the time requirement of the experimental session from becoming excessive from the subjects' perspective. The second was to focus on these components of control systems which have relatively greater accounting content.

Second, to ensure broad coverage of both control functions and cultural dimensions, each of the three control system components came from a different control function (planning, evaluating and rewarding). Each of these control components also relates to a different cultural dimension (uncertainty avoidance, power distance and individualism). In the preceding subsection, these three dimensions had provided the basis for directional predictions regarding individual control system components (Table 2). The fourth dimension, masculinity, was excluded because it was not associated with any unambiguous directional prediction.

Third, each of these three control system components was paired with a component of the remaining control function (organizing) which is related to the same cultural dimension. The organizing component paired with each control system component was one which we expected to affect the importance of the latter. Table 3 shows the three pairings of organizing components and control components. In addition,

¹¹ Relating to this control system component, Daley *et al.* (1985) predicted, but obtained contrary results, that U.S. subjects would agree more with having slack in budgets.

¹² This prediction is consistent with Daley *et al.*'s (1985) results but not their stated expectation.

¹³ In contrast to our lack of a directional prediction, Daley *et al.* (1985) hypothesized and found that U.S. subjects agreed more than did the Japanese subjects with using budget-based compensation.

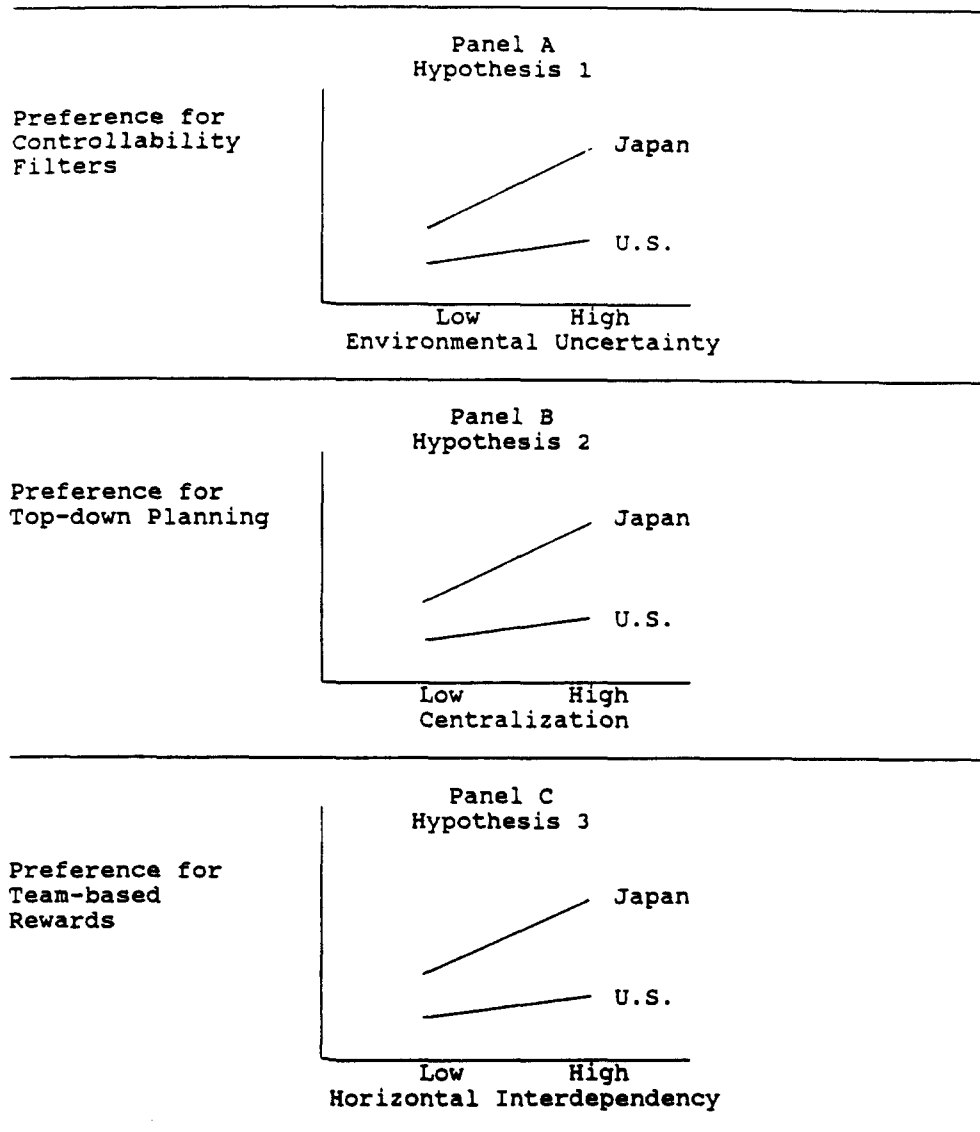


Fig. 1. Univariate predictions.

it shows their common cultural dimension which is used as a basis for developing an hypothesis about the preference for each pairing. For example, environmental uncertainty was paired with the use and non-use of controllability filters. Both are associated with the cultural dimension of uncertainty avoidance, and the uncertainty reduction effect of a controllability filter is expected to increase with the level of environmental uncertainty. Inclusion of the organizing component in this manner is based on the contingency theory perspective

that how a firm is organized provides the context and/or structure in which the planning, evaluating and rewarding control system components are designed and operated, and hence employees' reactions to, and preferences for, them (Birnberg *et al.*, 1990; Kren & Liao, 1988; Merchant & Simons, 1986). Thus, we expect that the level of the organizing component would affect the extent to which culture-based preferences would differ for the paired control component. Each of the first three hypotheses (see below) predicts an ordinal interaction effect between

TABLE 3. Independent and dependent variables of the univariate hypotheses

Dependent variable	Independent variables	
Control system component	Organizing component	Cultural dimension
	Hypothesis 1	
Controllability filters	Environmental uncertainty	Uncertainty avoidance
	Hypothesis 2	
Top-down planning	Centralization	Power distance
	Hypothesis 3	
Team-based rewards	Horizontal interdependency	Individualism

an organizing component and national culture on the preference for a control system component. The form of each interaction is graphed in Panels A, B and C of Fig. 1.

First consider uncertainty avoidance. The Japanese have a higher score on this cultural dimension than do the Americans. Based on the preceding discussion, we predict that for any level of environmental uncertainty, the Japanese would have a higher preference for controllability filters than would the Americans (Tables 2 and 3). Further, since the level of environmental uncertainty increases the uncertainty reduction effect of controllability filters, we predict that the difference between Japanese and U.S. preferences for controllability filters would increase with the level of environmental uncertainty:

H1. Japanese and American preference for controllability filters is an ordinal interaction of environmental uncertainty and national culture.

Considering power distance, the Japanese' higher score on this dimension leads to the prediction that they would have a higher preference than would the Americans for top-down, as opposed to participative, planning. This difference is predicted to hold across levels of centralization and to be a positive function of it:

H2. Japanese and American preference for top-down planning is an ordinal interaction of centralization and national culture.

Relating to individualism, we predict that, because the Japanese are lower on this cultural dimension, they would have a higher preference for team-based rewards than would the Americans. We also predict that this difference would increase with the level of horizontal interdependency:

H3. Japanese and American preference for team-based rewards is an ordinal interaction of horizontal interdependency and national culture.

Finally, to address the choice of a set of controls, we had noted the lack of extant evidence on both the interrelationships among control components and the relative effect of each cultural dimension on the preference for each component (Table 2). Thus, we are only able to predict that the Japanese and Americans would have different preferences for the set of 11 control system components:

H4. Japanese and American preference for a set of control components is a function of national culture.

EMPIRICAL METHOD

Experimental design

All subjects participated in four independent experiments. Each experiment focused on a separate hypothesis.

Each of the first three experiments had a 2 × 2 between-subjects design. The dependent variable in each experiment was the subject's stated preference for a particular control system component. A two-level, between-subjects variable included in each experiment was national culture (Japan vs the U.S.). The other two-level, between-subjects variable in each experiment was the organizing component paired to the particular control system component for which the subject was asked to indicate his or her degree of preference.

TABLE 4. Preference for controllability filters*

Environmental uncertainty	Japan	U.S.
High		
Cell mean	126.1	115.0
S.D.	48.6	49.0
No. observations	23	30
Low		
Cell mean	113.1	102.8
S.D.	44.2	44.6
No. observations	14	24

* 0 = Strong preference for no controllability filters; 100 = indifference; 200 = strong preference for controllability filters.

TABLE 5. Preference for top-down planning*

Centralization	Japan	U.S.
High		
Cell mean	65.6	61.1
S.D.	34.7	18.4
No. observations	18	22
Low		
Cell mean	75.9	59.1
S.D.	30.4	33.3
No. observations	20	32

* 0 = Strong preference for participative planning; 100 = indifference; 200 = strong preference for top-down planning.

between national culture and centralization was not significant ($p = 0.34$) in a 2 by 2 ANOVA. The main effect for national culture was marginally significant ($p = 0.10$) while the main effect for centralization was not significant ($p = 0.52$). Table 5 shows that, consistent with the prediction, the Japanese subjects' mean preference for top-down planning exceeded that of the U.S. subjects in both the high and low centralization conditions. However, only the difference in the low centralization case was statistically significant ($t = 1.87, p < 0.05$, one-tailed test). Also, the form of the ordinal interaction was contrary to the prediction. The difference in preference between the Japanese and U.S. subjects decreased (instead of increased) as centralization increased (mean = 16.6 for low centralization and 4.5 for high centralization). Thus, these results do not support H2.

Test of H3. H3 predicted that Japanese subjects would have a higher preference for

TABLE 6. Preference for team-based rewards*

Horizontal interdependency	Japan	U.S.
High		
Cell mean	102.5	115.1
S.D.	46.6	45.5
No. observations	16	30
Low		
Cell mean	95.4	73.7
S.D.	41.2	41.7
No. observations	20	24

* 0 = Strong preference for individual-based rewards; 100 = indifference; 200 = strong preference for team-based rewards.

team-based rewards under both low and high horizontal interdependency, and that the mean difference between Japanese and U.S. subjects would increase with interdependency (Fig. 1, Panel C). There was a marginally significant ($p = 0.07$) interaction between national culture and horizontal interdependency in a 2 by 2 ANOVA. However, its form was contrary to that predicted. When horizontal interdependency was low, the Japanese subjects had a significantly ($t = 1.75, p = 0.04$, one-tailed test) higher preference for team-based rewards (mean = 95.4 vs 73.1) than did the U.S. subjects (Table 5). But when interdependency was high, the U.S. subjects had a non-significantly ($p = 0.19$) higher preference for team-based rewards (mean = 115.1 vs 102.5). Finally, while both subject groups' preference for team-based rewards increased with horizontal interdependency, this significant ($p = 0.01$) main effect should be cautiously interpreted because of the presence of the significant interaction effect. Thus, H3 was not supported.

Test of H4. H4 predicted that Japanese and U.S. samples would have different preferences for the set of 11 control system components. Table 7 presents the mean values for the Japanese and U.S. subjects' preferences for these components.

A 2 by 11 MANOVA was used to test the significance of these differences in means. The between-subjects factor was a two-level variable for national culture, and the within-subject variable had 11 levels for the control system

TABLE 7. Cell means and standard deviations of stated preferences*

Variable	Japan		U.S.		<i>t</i>	<i>p</i>
	Mean	S.D.	Mean	S.D.		
Environmental uncertainty	6.38	1.77	6.09	1.87	0.56	0.58
Hierarchy height	3.46	0.97	3.57	1.27	0.58	0.56
Centralization	3.10	1.60	3.30	2.20	0.37	0.71
Horizontal interdependency	4.82	1.76	5.24	2.12	0.80	0.43
Formal rules	6.18	1.83	4.28	1.89	4.78	0.01
Top-down planning	3.39	1.76	2.98	1.90	1.06	0.29
Standard difficulty	5.36	1.83	4.83	1.80	1.16	0.25
Controllability filters	6.95	1.69	6.48	2.70	0.91	0.37
Relative evaluation	5.21	2.12	5.87	2.10	1.44	0.15
Team-based rewards	5.69	2.43	5.04	2.54	1.34	0.18
Preset pay	6.10	1.89	5.96	2.24	0.11	0.91

* 0 = Extremely low preference, and 10 = extremely high preference.

Number of observations: Japan, 39; U.S., 54.

components. The main effect for national culture was not significant ($F = 0.52, p = 0.47$). Both the control system components main effect and the interaction between these components and national culture were highly significant (respectively, $F = 31.00, 3.35; p = 0.000, 0.001$). The significant interaction indicated that the Japanese and U.S. subjects had made systematically different choices among the 11 control system components. To investigate which of the 11 controls were differentially preferred by the two groups, a *t*-test was performed on each one. As shown in Table 7, only one of the 11 tests indicated a significant difference: for formal rules, the Japanese had a higher preference than did the U.S. sample (means = 6.18, 4.28; $t = 4.78, p < 0.01$).¹⁷ Overall, these results provided support for H4.

DISCUSSION AND SUMMARY

Understanding how cultural differences affect individuals' preferences for, and reactions to, management controls is both an important and challenging issue. Prior research has either used cultural theories to empirically examine aggregated functions of a control system (e.g. monitoring, evaluating) or empirically examined specific controls (e.g. standard tightness, participation) without using cultural theories as a basis for predicting or interpreting the results. This study has tried to adopt the strengths of each previous approach by using Hofstede's (1980, 1991) taxonomy of work-related cultural dimensions to guide an experimental investigation of preferences for specific management controls.

A major departure of this study from prior

¹⁷ To gain insights into the subjects' groupings of the 11 control components, we factor-analyzed their vectors of stated preferences. A varimax rotation identified five orthogonal factors with eigenvalues above 1.0. Together, these factors explained 62% of the total variance. Using a loading criterion of | 0.50 |, every control component loaded on a single factor. This result suggested that the subjects viewed the 11 control components as comprising distinct subsets. However, we were unable to interpret the five factors, owing to the disparate nature of their constituent components. This finding suggests that the interrelationships among control components and the effects of the four cultural dimensions are highly complex. We also used each subject's five factor scores as the dependent variable in a 2×5 MANOVA, with national culture as the two-level between-subjects independent variable, and control factor as the five-level within-subjects variable. Consistent with the expectation of a difference between Japanese and U.S. subjects' preferences, the factor score by national culture interaction was significant ($p = 0.002$). A *t*-test on each factor indicated that only the means for one of the factors were significantly different between the two samples ($p = 0.002$).

research is the focus on the interface between the organization and the external labor market. It is suggested that the fit between an organization's control and national culture can affect more than the job-related actions of a given set of employees. Rather, it also may affect the costs of attracting employees and the job-related characteristics of the employees attracted to the organization.

The results of the first three experiments provided, at best, very weak support for the three univariate hypotheses. Each of these experiments tested a theory-based hypothesis about how national culture and an organizational context or structure variable interactively affect an individual's preference for a management control. In contrast, the results of the fourth experiment provided support for the multivariate hypothesis.

Many potential explanations exist for this study's findings. Addressing the validity and relative impacts of these explanations presents fruitful directions for future research. Consider first the results of testing the three univariate hypotheses. One reason for the unexpected findings is that some of the cultural dimensions may not have had strong effects on preferences. For example, Hofstede (1991) has suggested that the uncertainty avoidance dimension may not be a universally applicable construct. This could have explained the lack of support for the predictions regarding preferences for controllability filters. Hofstede (1991) presents evidence that a new dimension, called Confucian dynamism (or long-term vs short-term orientation in life), has recently been empirically found in studies using Western and/or Eastern samples. Perhaps this dimension could explain an individual's preference for budgeting, performance measurement and rewards which cover different lengths of time.

Alternatively, the cultural dimensions may be important determinants of preferences for management controls, but the Japanese and U.S. samples did not diverge enough on these dimensions to provide sufficiently strong tests of the predictions. For example, both national cultures have scores on power distance in the

middle range of Hofstede's 100-point index (54, 40). On each of the other three dimensions, one national culture has a high score (> 90) and the other culture has a score in the middle range of the index (46, 46, 62). We had selected the Japanese and U.S. cultures for study because of their important roles in the global economy. While their cultures did differ on Hofstede's dimensions, *ex post*, these differences may not have been extreme enough to provide sufficiently powerful tests. Future research could provide more powerful tests of hypotheses by selecting national cultures which are more divergent than the two used in this study.

Similarly, the experiment may have been limited by the degree to which extreme manipulations of the organizational context or structure variables had been used. While the manipulation checks supported the success of inducing low and high levels of each treatment, more extreme levels of each treatment may have provided more powerful tests of the predicted effects.

At the multivariate level of choosing multiple control components, a limitation of the current study is that it did not examine how cultural differences affect preferences for subsets of controls. This limitation was due to the absence of extant theoretical and empirical literatures on the complementary and substitute relationships among controls, as well as the relative effects of different cultural dimensions on the preference for a particular control. Because of this lack of guidance from the extant literature, we could only predict a difference between the Japanese and U.S. samples, but we had very limited ability to explain the significant difference that was found. Hence, an important implication of this study is the need for theoretical and empirical research to identify how preference structures for management controls are affected by national culture.

One way to further refine theoretical development in the area is by means of empirical research which integrates two related activities. One is to use multivariate preference scaling and estimation methods (e.g. multidimensional scaling conjoint analysis, LINMAP, PREFMAP) to

develop multidimensional representations (i.e. "mental models") of individuals' preferences for sets of management controls. By itself, this research activity could provide inductive evidence on how individuals view control system components as being independent, substitutes, or complements.

The second research activity is to construct such representations for individuals from different national cultures to test how variation in national culture is associated with variation in these representations. For example, to isolate the effects of each of Hofstede's four cultural dimensions on such preference representations, one could dichotomize each cultural dimension (e.g. low, high) and gather data from 16 countries (= 2⁴) which occupy these 16 cells of a factorial design.

More focused studies also are possible by selecting a set of nations that are similar on some cultural dimensions but not on others. For

example, Hofstede's (1980, 1991) results indicate that Norway and Sweden have about equal scores on three of the four cultural dimensions (power distance, individualism and masculinity). Thus, a comparison of the preference representations between samples from these two nations can be used to study the effects of uncertainty avoidance.

In closing, this experimental study has presented evidence that some differences exist between Japanese and American preferences for controls at the organization-external labor market interface. Many of the observed differences, however, were inconsistent with predictions based on Hofstede's (1980, 1991) model. As such, the findings of this study suggest that the relationship between management control preferences and national culture is complex and probably influenced by many variables. Much opportunity exists for additional research on this important and interesting topic.

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