

CULTURAL RECEPTIVITY: PREDICTING CONSUMPTION IN THE INTERNATIONAL BEVERAGE MARKET

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ABSTRACT

The purpose of this study was to further explore the potential of the Hofstede paradigm as a predictor, and to uncover some meaningful interaction effects. Hofstede's Cultural Dimensions as predictors, rather than correlates, of consumer behavior at the national level are presented and discussed as an example. Potential for methodological application cuts across many fields. National cultures and volume consumed were studied in these empirical analyses of the international beverage market. The purpose was to discern patterns of variability in nations' receptivity to products offered by The Coca-Cola Company, as predicted by Hofstede's six Cultural Dimensions, urbanization, and income using regression analyses. Results indicated that, including Hofstede's recently published dimension of Indulgence Versus Restraint (IVR), cultural dimensions alone predicted up to 63% of the variability in volume consumed. Predictive models containing Uncertainty Avoidance Index (UAI), Individualism (IDV), and variable interactions were worthy challengers to models including urbanization, a known correlate with product distribution and advertising. This research should be of particular interest to any multi-national company, marketing researchers or practitioners, psychologists, sociologists, and behavioralists interested in the cultural context of acceptance. Results for BRIC countries, Mexico, Indonesia, and other nations were discussed.

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KEYWORDS: Culture, Coca-Cola, Coke, Consumption, Equation, Hofstede, International, Marketing, Predict, Regression

INTRODUCTION

The main objective of this study was to further explore the potential of the Hofstede paradigm as a predictor as well as investigating meaningful interaction effects. Hofstede's Cultural Dimensions as predictors, rather than correlates, of consumer behavior at the national level were presented and discussed in simple language. Hofstede, Hofstede, and Minkov (2010) indicated that product performance as related to cultural dimensions was only recently introduced in scholarly literature. Furthermore, they stated that, "understanding the variations in what motivates people is important for positioning brands" (p. 94). Variable receptivity to branding, at least in the case of The Coca-Cola Company, was shown to be driven by national cultural dimensions and in some cases interactions between two or more cultural dimensions (Lanier, 2011).

Bhushan (2001) remarked that urbanization adds fuel to the fire of evolving consumer preferences because it eases the difficulty of distributing products to the masses. Urbanization is also linked to per capita income, which makes affordability less of a barrier for consumers as well. Evolving beverage trends have paralleled the rapid growth of markets including the so-called BRIC countries of Brazil, Russia, India, and China. Rapid growth and market changes have also occurred in certain African nations, such as Ghana and Nigeria.

Although culturally different, each of these countries has become more modern, urban, and economically powerful in its own way over the past 50 years. Furthermore, each has exhibited a different profile of

cultural dimensions (Hofstede, 1980; www.geert-hofstede.com, 2011). Using these measures of culture, one may explore relationships between culture and the evolution of beverage markets. In fact, it may be possible to determine the cultural receptivity of a nation to The Coca-Cola Company's brands and other available beverage products.

LITERATURE REVIEW

Seminal works containing concepts applied directly to the research topic included *Culture's Consequences: International Differences in Work-Related Values* (Hofstede, 1980), *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations* (Hofstede, 2001), and *Cultures and Organizations: Software of the Mind* (Hofstede, Hofstede, & Minkov, 2010). Minkov's (2007; 2011) extension of cultural dimensions from the World Value Survey included the addition of Indulgence Versus Restraint (IVR), a new cultural dimension to Hofstede's five previously defined dimensions: Power Distance Index (PDI), Individualism Versus Collectivism (IND), Masculinity Versus Femininity (MAS), Uncertainty Avoidance Index (UAI), and Long-term Versus Short-term Orientation (LTO). Each of these works fulfilled an important need in the research goal. Along with data available from The Coca-Cola Company and gapminder.org, Hofstede's cultural dimensions potentially linked national behavioral tendencies with national product results. Additionally, Hofstede's and Minkov's research facilitates a more simple understanding of complex data by allowing the reader, manager, or leader to glean meaning from cultural dimension data with renewed perspective.

As a social psychologist, Geert Hofstede has been considered the father of cross-cultural research due to his creation of a paradigm for national cultures. His definition of culture in *Culture's Consequences* (Hofstede, 1980) was "the collective programming of the mind which distinguishes the members of one human group from another" (p. 25). When Hofstede's study of culture within IBM was published, it immediately drew attention. Before that time, human nature was widely considered a natural tendency attributable to all humans, but Hofstede determined that human nature must be redefined in terms of cultural context. Since much of the world's business, social, and psychological research had been conducted in North America and Europe, the conceptual framework for human nature was incomplete. Hofstede's findings strongly influenced the fields of business, sociology, psychology, and many others. The perspective of researchers was introduced as a variable dependent upon culture rather than independent or constant.

Hofstede's research is ongoing and he has suggested several areas for future research. For example, he suggests that Asian researchers have an important role to play in trading ideas with colleagues from other parts of the world in order to escape from the cultural restrictions of one's own Western research perspective (Hofstede, 2001). Hofstede suggested future replications, simulations, and acculturation studies to develop a better understanding of personality and other human traits. Finally, he encouraged research in the business arena where he predicted that cultural norms of a long-term view and more responsibility toward society will outlast somewhat recent obsessions with growth and personal wealth.

Standard criticisms of Hofstede's work include: weaknesses of surveys in general, that nations are not suitable for studying culture, that the use of one company weakens the implications, that old data was used, and that additional dimensions must be developed to explain human behavior. Even Hofstede himself raises questions about how American ideas for business may have been imported by businesses in other countries (Goodstein, Hunt, & Hofstede, 1981). However, some of these weaknesses may also act as strengths, depending on uses of the data, because Hofstede's cultural dimensions proved to be concise and powerful.

Notably, researchers have analyzed applications of Hofstede's work (Kirkman, Lowe, & Gibson, 2006; Taras, Kirkman, & Steel, 2010) to suggest limitations and make recommendations for researchers who

plan to envelop their study within Hofstede's paradigm. Despite the critics of Hofstede's (1980, 2001, 2010) *Culture's Consequences*, users of the cultural paradigm have often found it to be revealing in many fields of research and practice. Taras, Kirkman, and Steel (2010) noted that a quantitative examination of Hofstede's cultural value dimensions was "conspicuously absent" (p. 405) from the body of research. Therefore, they conducted a meta-analysis of nearly 600 empirical studies encompassing at least 200,000 participants. Relationships between cultural dimensions and measurable outcomes such as emotions, attitudes, behaviors, and job performance were explored. In the course of their research, the use of cultural values in general and Hofstede's cultural dimensions specifically as the focus of research was questioned and resolved. Ultimately, the recommendation for scholars to continue using Hofstede's framework in research was strongly supported, as long as culture was relevant to the research question and national dimensions of culture were suitable (Taras, Kirkman, & Steel, 2010).

One of the primary motivations for the extensive study conducted by Taras, Kirkman, and Steel (2010) was to determine the overall value of Hofstede's dimensions as predictors. Each of the four initially described cultural dimensions (PDI, IND, MAS, and UAI) were analyzed for predictive power. Although IND was the most popular subject of study (Kirkman, Lowe, & Gibson, 2006; Oyserman, 2002), no evidence existed to suggest this dimension was the best predictor for expressions of culture (Taras, Kirkman, & Steel, 2010).

The decision proposed by Taras, Kirkman, and Steel (2010) to refrain from making predictions about relationships between specific cultural dimensions and specific outcomes "but rather to take a higher level overview of Hofstede's cultural value effects," did not prevent them from publishing some very useful results. For example, regarding emotions and attitudes, cultural dimensions provided stronger predictive power than measures of personality. Furthermore, cultural dimensions proved to be a relatively valuable predictor of emotions, attitudes and perceptions, and behaviors.

Perhaps most relevant to this research were the following statistically significant positive relationships when studying data at the national level (Taras, Kirkman, & Steel, 2010): Individualism with Wealth (0.70), Innovation (0.65), Income Equality (0.64), and Satisfaction (0.64); Masculinity with Corruption (0.29) and Wealth (0.11); Power Distance with Corruption (0.83), Agreeableness (0.46), Conformity (0.42), and Family Importance (0.34); Uncertainty Avoidance with Neuroticism (0.59), Corruption (0.43), and Conformity (0.26). Marketing messages often make reference to attitudes or behaviors such as those listed above. Therefore, direct relationships between cultural dimensions and attitudes affecting consumer choices are almost certain to exist. Moreover, characteristics of nations pertaining to these behaviors could certainly affect a population's receptivity to beverage products.

Conversely, the following negative relationships were among those found to be statistically significant at $p < 0.05$ (Taras, Kirkman, & Steel, 2010): Individualism with Corruption (-0.84), Family Importance (-0.55), External Locus of Control (-0.46), Agreeableness (-0.42), and Conformity (-0.42); Masculinity with Gender Role Equality (-0.50) and Satisfaction (-0.16); Power Distance with Income Equality (-0.60), Openness (-0.54), Gender Role Equality (-0.49), Extraversion (-0.48), and Human Rights (-0.45); Uncertainty Avoidance with Satisfaction (-0.49), Innovation (-0.45), Income Equality (-0.25), and Wealth (-0.23).

Results of these meta-analyses signify the importance of cultural dimensions as significant predictors of many emotions and attitudes. Purchases of beverage products are commonly linked to the products' emotional appeal. Therefore, it may be reasonable to expect that these cultural dimensions are also related to consumer decisions such as beverage choice.

In fact, Punyapiroje (2002) found that the most commonly used approach in Thai advertising for food and beverage products was fun and pleasure value. Similarly, Strauss (1998) found that culture-specific

tendencies were responsible for the emotional appeal of advertisements in Japan and Korea. The web of relationship between cultures, emotions, and beverages seemed likely to exist and may be quite strong.

DATA AND METHODOLOGY

Populations of countries used in this study were represented primarily by national data available from The Coca-Cola Company's 2010 annual report (2011); Hofstede, Hofstede, and Minkov (2010); and gapminder.org (2011). The Coca-Cola Company provided a ubiquitous product line upon which to study relationships between products and cultures. Data was available for the volume of beverage products distributed throughout each of 35 countries. Gapminder.org provided data by country regarding urbanization, per capita income, and other characteristics of each nation.

Scores for each of five cultural dimensions were reported by nation and by world region (Hofstede, 2010). Although Hofstede's fifth and sixth dimensions of Long Term Orientation and Indulgence versus Restraint, respectively, were only available for a select subset of nations, the nations of primary interest in this research were included in that subset. Populations of world regions may be represented by the aggregated data of nations making up Latin America, Asia, Europe, and North America.

In some cases, not all countries in the region were included under that data label. That is, the data from some nations may be missing when aggregated. However, national data was the level of analysis most appropriate for this study (Hofstede, 2010). Therefore, world regions were not a primary focus.

Examining prediction equations of the following form led to a cultural model for product volume consumed:

$$VOL = \beta_0 + \sum \beta_i H_i + \beta_7 URB + \beta_8 PCI + \varepsilon, \text{ where } i = 1 \text{ to } 6, \quad (1)$$

where H_i represents each of Hofstede's six cultural dimensions.

Eventually, interaction effects were examined and their role in prediction equations of the form

$$VOL = \beta_0 + \sum \beta_i H_i + \sum \beta_{ij} H_i H_j + \varepsilon, \text{ where } i = 1 \text{ to } 6, j = 1 \text{ to } 6, \quad (2)$$

where each pair $H_i H_j$ represents a cross-product potentially resulting in a positive interaction effect between two cultural dimensions.

This formula can be extended further to include trios of variables. The objective of designating a model for volume consumed, potentially including interactions among Hofstede's Cultural Dimensions, was met by presenting models and discussing preferences for model selection to maximize efficiency of the prediction process.

The dependent variable represented by VOL was the per-person-volume of The Coca-Cola Company's beverages consumed in each country annually. The brands appearing in Table 1 below, and some smaller brands, were measured for 32 different countries (The Coca-Cola Company, 2010) which also were measured using Hofstede's Cultural Dimensions (Hofstede, Hofstede, and Minkov, 2010). This dependent variable, VOL, represents a measure of national receptivity to the company's products.

The independent variables used to predict VOL fall into two categories: cultural dimensions and societal norms. The cultural dimensions used were described in detail by Hofstede (2010) to include Power Distance Index (PDI), Individuality (IDV), Masculinity (MAS), Uncertainty Avoidance Index (UAI),

Long Term Orientation (LTO), and Indulgence Versus Restraint (IVR). These dimensions have been routinely maintained, and are available for 76 countries (PDI, IDV, MAS, and UAI) or 93 countries (LTO and IVR) depending on the publication edition in which each dimension first appeared.

Table 1: A List of the Coca-Cola Company’s Largest Beverage Brands

Sparkling Beverages		Still Beverages	
	Juices and Juice Drinks	Coffees and Teas	Waters
Coca-Cola	Minute Maid	Nestea Teas	Ciel
Sprite			
Diet Coke / Coca-Cola Light	Simply	Georgia coffees	Dasani
	Dobriy	Sokenbicha teas	Bonaqua /Bonaqa
	del Valle	Leao / Matte Leao	Ice Dew
Coca-Cola Zero / Coke Zero	Cappy	Teas	Kinley
Schweppes		Dogadan teas	Glacéau Smartwater
Thums Up			
Fresca	Energy Drinks	Other Still Beverages	Sports Drinks
Barq's			
Lift	Burn	Glacéau Vitamin Water	Powerade
Pop			
Inca Kola	Relentless	FUZE	Aquarius
Kuat	NOS		
	Full Throttle		

This table shows the Coca-Cola company’s largest brands.

The societal norm measures including urbanization (URB), and Per Capita Income (PCI), were available for 205 countries. URB represents the percentage of total population living in areas defined as urban, as reported to the United Nations. PCI represents per capita income calculated using gross domestic product converted to international dollars using purchasing power parity (PPP) ratings. Data were reported in constant 2005 international dollars.

In order to construct a complete dataset to be used in analyses, only the 32 countries with measures for each of the dependent and independent variables were studied. The Coca-Cola Company distributed two or more brand names within each of the 32 countries.

The first research question of interest was, “Are national measures of cultural dimensions, urbanization, and economic success statistically significant predictors of a nation’s receptivity to beverage categories?”

A model using seven of the eight independent variables (without IVR) explained 61.35% of the variability in national consumption of The Coca-Cola Company’s products ($F = 3.85, p < 0.05$). All of the correlations between independent variables and VOL were relatively low with one notable exception: Urbanization, URB, was significantly correlated with product volume, VOL, ($r = 0.7048, p < 0.0001$), as seen in Table 2 below. The literature indicated that urbanization contributed to mass distribution of beverage products (Bhushan, 2001), although no empirical evidence was provided. Therefore, this correlation came as no surprise, but did help to quantify and formalize the relationship between urbanization and volume consumed.

Could it be that urbanization dominates culture when predicting beverage consumption? Or that an “urban culture” exists to explain variability in the volume consumed of The Coca-Cola Company’s beverages? In fact, urbanization alone accounted for 49.67% of the variability among countries’ product consumption, and the model was statistically significant ($p > 0.0001$). Both the intercept and the coefficient for URB were statistically significant with $p = 0.0154$ and $p < 0.0001$ respectively.

At this point, one could be satisfied that URB dominates the prediction of VOL and decide that no further study is worthwhile. However, with at least 11.68% (61.35 minus 49.67) of product consumption

explained by other variables in the full model of the first equation, and *possibly more* due to interactions between dependent variables or the addition of IVR, this question was pursued further.

Table 2: Correlations between Cultural Dimensions and the Dependent Variable, VOL

	(PDI) Power Distance Index	(IDV) Individualism	(MAS) Masculinity	(UAI) Uncertainty Avoidance Index	(LTO) Long-Term Orientation	(URB) Urbanization	(PCI) Per Capita Income
VOL Correlation Coefficient	-0.2547	0.2928	0.0985	0.3382	-0.0445	0.7048	0.3134
Probability	0.1595	0.1039	0.5917	0.0583	0.8328	<0.0001	0.0807

This table shows the correlations between Hofstede’s Cultural Dimensions and Product Volume Consumed.

The equation listed below is a first model for cultural receptivity in that it predicts volume of product consumed using *only* Hofstede’s Cultural Dimensions as predictors:

$$VOL = -612.86097 + 6.02334(INV) + 0.51502(LTO) - 1.23483(MAS) + 3.49094(PD) + 6.04430(UA) \quad (3)$$

The ANOVA in Table 3 below indicates that 45.97% of the variability in product consumption was explained by Hofstede’s cultural dimensions alone. This brings into question the dominance of URB for predicting VOL.

The model was statistically significant, and parameter estimates for IDV and UAI were also statistically significant. A model that successfully predicts 46% of variability in consumption of The Coca-Cola Company’s beverage products using only cultural dimensions has been identified.

The analyses of this research question established several new pieces of evidence:

1. URB was significant, accounting for 49.67% of the variability in VOL.
2. Hofstede’s Cultural Dimensions alone explained *at least* 45.97% of the variability in product volume, and possibly more when interactions are considered.
3. These equations could likely be improved and refined by modifying the regression model and applying statistical techniques.

These results successfully led to a second research question: “Do interaction effects exist between cultural dimensions, thereby improving prediction models of the same form when predicting receptivity?”

Regressions on many possible variations of the equations given above were conducted using one, two, three, four, five, and six predictor variables. Typically the contributions of predictor variables may overlap and therefore the model’s overall effectiveness is less than the sum of its parts. However, it is possible for variables to interact in such a way that the overall effect is *greater* than the sum of its parts.

For example, IDV alone explained 9% of the variability observed in VOL, and UAI explained 11% of that variability. One might expect that these two variables together predict no more than 20% of the variability observed in VOL. Surprisingly, the model with both IDV and UAI entered as predictors of VOL yielded an R² of 0.27, explaining 27% of the variability in VOL. This synergetic relationship is indicative of an interaction effect. There also appeared to be a rather strong interaction effect between LTO, IDV, and UAI. These three variables combined to increase R² by 0.21, from a sum of 20% added individually to a total of 41% when entered into the model as a trio.

Table 3: Linear Regression Results Using Hofstede’s First Five Cultural Dimensions as the Lone Predictors

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	336,147	67,229	3.23	0.028**
Error	19	395,041	20,792		
Corrected Total	24	731,188			
Root MSE	144.193	R-Square	0.4597		
Dependent Mean	207.36	Adj R-Sq	0.3175		
Coeff Var	69.5376				
Variable	Parameter Estimate	Standard Error	t Value	Pr > t	
Intercept	-612.8610	318.4419	-1.92	0.0694*	
PDI	3.4909	2.8768	1.21	0.2398	
IDV	6.0233	2.1000	2.87	0.0098***	
MAS	-1.2348	2.4986	-0.49	0.6268	
UAI	6.0443	1.7296	3.49	0.0024***	
LTO	0.5150	1.3232	0.39	0.7014	

This table shows the Analysis of Variance when Hofstede’s Cultural Dimensions are the lone predictors of Product Volume Consumed.

Of the 62 possible combinations of six independent variables, 11 combinations displayed a positive change in R² greater than the sum of individual variable contributions. These synergetic relationships resulted in increases to the R² statistic ranging from 1% to 21%. Table 4 displays each significant model’s terms, predictor variables entered, and R² increase achieved due to interaction effects between each combination of variables. Although other interactions may exist and be useful, in this case two of the strongest interaction effects were pursued using cross-products of predictor variables.

Table 4: Selected Models from a Comprehensive Search for Interactions

Predictor variables	Model’s R-square	Statistical Significance	Change in R ² due to interaction
IDV	9%	No	n/a
MAS	1%	No	n/a
UAI	11%	No	n/a
LTO	0%	No	n/a
URB	50%	p < 0.05	n/a
PDI, UAI	20%	P < 0.05	+3
IDV, UAI	27%	p < 0.05	+7
PDI, IDV, UAI	27%	p < 0.05	+1
IDV, MAS, UAI	27%	p < 0.05	+6
IDV, UAI, LTO	41%	p < 0.05	+21
IDV, MAS, UAI, LTO	42%	p < 0.05	+21
PDI, IDV, UAI, LTO	45%	p < 0.05	+19
PDI, IDV, UAI, LTO, PCI	45%	p < 0.05	+9
PDI, IDV, MAS, UAI, LTO	46%	p < 0.05	+19
LTO, URB	54%	p < 0.05	+4
MAS, LTO, URB	54%	p < 0.05	+3

This table shows possible models from a comprehensive search for interactions.

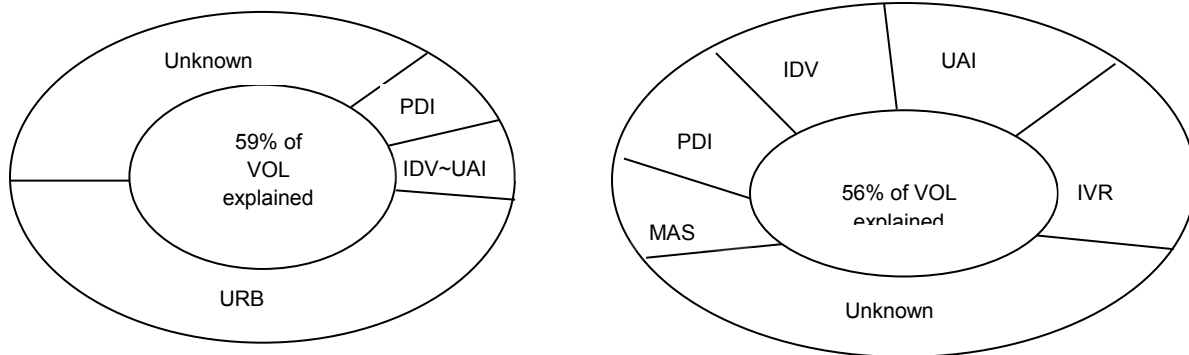
The existence of interaction effects among Hofstede’s cultural dimensions led to third research question: “What parsimonious model could be determined to predict volume consumed?”

Initially, the most powerful and relatively simple variable for predicting product consumption was Urbanization, as URB alone predicted about 50% of the variability in VOL. However, an R² statistic of 0.61 was obtained when all variables were included in the regression model. Hopefully, a regression model with fewer variables could yield a similar R² and therefore be a more efficient way to predict VOL.

In fact, the addition of IVR was a huge improvement of the predictive model. The model was more highly significant, statistically speaking; had three statistically significant predictors instead of only two;

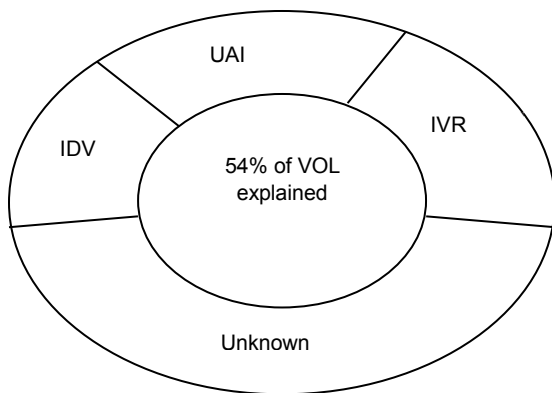
and improved R^2 by 10 percentage points, an increase in predictive power of 21% from 0.4597 to 0.5582. Furthermore, prediction power increased while the number of variables in the model was reduced.

Figure 1: Models for Volume Consumed With and Without Urbanization as a Predictor



This figure shows the effect of urbanization as a predictor.

Figure 2: A Three-variable Model for Volume Consumed



This figure shows the three-variable model for volume consumed.

CONCLUSIONS

This study has taken a broad view of the relationships between cultural dimensions and the products of one company, in one industry, and in only a few of the world's countries. However, there is enough material contained within the above models, equations, and results to encourage further study of these, and other, relationships. Only some of the many potential findings, examples, and implications are given here.

Overall, analyses conducted for this study revealed some surprising results. First and foremost was the discovery that Hofstede's first five cultural dimensions *alone* predicted nearly half, 46%, of the variability observed in national consumption of The Coca-Cola Company's beverages. With the addition of IVR, the predictive power jumped to 63%. This information should be of particular interest to both The Coca-Cola Company and their competitors, but also to any multi-national company, marketing practitioners, marketing researchers, and behavioralists. This research validates Hofstede's original work for use in consumer behavior, at least at the national level, as well as for its well-recognized usefulness in studying organizational behavior.

Secondarily, the belief that urbanization was a factor in product consumption (Bhushan, 2001) was upheld. Urbanization appears to be a key factor in the distribution and consumption of products offered internationally by The Coca-Cola Company. However, it is also clear that Hofstede's cultural dimensions enhance the understanding of these relationships, and that Hofstede's dimension of Indulgence versus Restraint was at least as valuable as Urbanization.

Furthermore, interaction effects were discovered between Hofstede's cultural dimensions. In this case, Hofstede's Individuality measure appeared to interact with his Uncertainty Avoidance Index to predict product consumption. This finding alone uncovers the potential for nine more paired variables based on Hofstede's five cultural dimensions, and 14 more when using IVR. These potential interactions may facilitate research in any behavioral setting.

A case was supported for developing predictive equations for marketing purposes. Marketing is a field that is data rich, but much of the available information is not used to its fullest purpose. Opportunities abound for the marketing researcher to glean information from the many sources of data, and produce meaningful models that enhance our understanding of human interactions. This understanding continues to evolve with new developments such as Hofstede, Hofstede, and Minkov's (2010) recent presentation of the cultural dimension Indulgence versus Restraint.

Finally, it is reasonable to conclude that the evolution of tastes takes place differently in each country, and that cultural variables are at least partially, if not largely, responsible for these patterns. Beverage choices, and the evolution thereof, are dependent on the measurable cultural and societal variables researched for this study. Hofstede's cultural dimensions can and should also be used to measure beverage categories within companies, new product introductions, and to predict future directions of the global beverage market.

Taras, Kirkman, and Steel (2010) alluded to the predictive power of Hofstede's Cultural Dimensions, but concrete business examples of predictive equations and interactions between dimensions are scarce. Therefore, the practical implications of this 32-nation study should be clear for market researchers, beverage companies, and any other multinational company. Theoretical implications are clear for researchers in psychology, sociology, consumer behavior, and other fields: interaction effects between cultural dimensions deserve further study, and recently introduced IVR may be a powerful idea for better understanding culture in the context of behaviors.

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