Launching Rockets: Introducing Hofstede Pairs to Business Analyses, and the Risks of Ignoring Them

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Abstract for the *Global Business Research Symposium*

Abstract:
This paper describes a methodological approach for discovery of mathematical relationships between national measures of behavior and compound variables created from Hofstede's Cultural Dimensions (1980, 2001, 2010). Weak, inversely correlated predictors referred to as "Hofstede Pairs" were found to yield statistically significant contributions when used conjointly. An example from rocket science is used to demonstrate the methodology. In each of three cases, convolutions significantly contributed to an improved regression model, often displacing a previously-dominant predictor established via multiple prior studies.

*Outcomes described in this primer demonstrated that predicting the dependent variables of product consumption (Lanier, 2011 & 2013), happiness (Hordvik, 2018), and corruption perception (Lanier, 2018) resulted in statistically significant interactions between Hofstede's published dimensions: IDV*UAI, both IDV*MAS and LTO*IVR, and LTO*IVR respectively. In each case, these convolutions were found to explain between 27% and 60% of variability in the dependent variable. Findings consistently indicated that extreme values of Hofstede's dimensions were less than ideal, and moderate values interacted for improved modeling of these dependent variables (maximizing consumption, minimizing corruption, and maximizing happiness). Implications include improved understanding of relationships between culture and behavior. Further research is needed to establish other contexts where convolutions/interactions dominate or strengthen the most parsimonious and effective regression models.*

INTRODUCTION

The main objective of this study was to further explore the potential of cross-product variables in the Hofstede paradigm to predict behavioral outcomes, thereby determining methods for

investigating meaningful interaction effects among cultural dimensions. Hofstede's Cultural Dimensions as predictors, rather than correlates, of dependent variables measured at the national level were presented and discussed. Examples indicate that dependent variable measures were consistently shown to be driven by national cultural dimensions and particularly interactions (or mathematical convolutions?) between two cultural dimensions.

Although culturally different, each country in these analyses has an opportunity to influence the behavior of its governmental units and citizens. Furthermore, each has exhibited a different profile of cultural dimensions (Hofstede, 1980; www.geert-hofstede.com, 2011). Using measures of culture, one may explore relationships between culture and the evolution of behaviors. In this case, these relationships are used to demonstrate the value of including cross-product terms during regression modeling procedures .

LITERATURE REVIEW

Hofstede's Cultural Dimensions

Seminal works from Geert Hofstede containing concepts applied directly to this 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, as a relatively new variable to Hofstede's data matrix.

IVR was the most recently defined cultural dimension added in 2010 to Hofstede's five previously defined dimensions of Power Distance Index, PDI; Individualism Versus Collectivism, IND; Masculinity Versus Femininity, MAS; Uncertainty Avoidance Index, UAI (Hofstede, 1980); and Long-term Versus Short-term Orientation, LTO (Hofstede, 2001). 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).

Before Hofstede's work, human nature was widely considered a tendency attributable to all humans. Hofstede determined that human behavior 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 psychology, sociology, business, and many other areas.

Hofstede's research is ongoing and several areas were suggested for future research. For example, he suggested that Asian researchers have an important role to play in conversing 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

encouraged research in the business arena where he predicted that cultural norms of a long-term view and more responsibility toward society will outlast the focus on 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 more 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 have often proved to be concise and powerful.

Mathematical Statistics and "Hofstede Pairs"

As Draper and Smith (1981) indicated in their applied regression text, "Often there exists a functional relationship which is too complicated to grasp or to describe in simple terms." Therefore, one of the purposes of regression techniques is to explain "the main features of the relationships hidden or implied" by way of a mathematical equation.

Regression equations typically employ independent variables to help to explain the variability in a selected dependent variable. However, Draper and Smith (1981) also pointed out that, "Terms for possible inclusion in the model might involve not only the principal variables but also variables such as cross products, squares, or other combinations, or transformations of the principal variables." These less-often-used variables are exactly the kind found to be useful in this study.

Mathematical combinations or transformations of two functions, used to create a third function, are referred to in literature as a convolution (Hogg & Craig, 1978). However, examples are challenging to find in applied cross-cultural business literature. Still, cross-product terms and other combinations should be considered as independent variable candidates for regression equations when they can be used to improve modeling (Draper & Smith, 1981). In this study, cross-product mathematical convolutions created from Hofstede's Cultural Dimensions (simply multiplying one cultural dimension score by another) will be referred to as Hofstede Pairs.

Culture, Correlation, and Regression

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 utilize Hofstede's paradigm. 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.

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 of 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, perceptions, and behaviors. 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.

The following statistically significant ($p < 0.05$) positive and negative correlation relationships presented in Table 1, were reported when studying data at the national level (Taras, Kirkman, & Steel, 2010):

Table 1: Correlations between Cultural Dimensions and Corruption, Happiness, or Consumption

IDV, Individualism vs Collectivism				
	Positive		Negative	
	Wealth	0.70	Corruption	-0.84
	Innovation	0.65	Family Importance	-0.55
	Income Equality/Satisfaction	0.64	External Locus of Control	-0.46
MAS, Individualism Masculinity vs Femininity				
	Corruption	0.29	Gender Role Equality	-0.50
	Wealth	0.11	Satisfaction	-0.16
PDI, Power Distance Index				
	Corruption	0.83	Income Equality	-0.60
	Agreeableness	0.46	Openness	-0.54
	Conformity	0.42	Gender Role Equality	-0.49
UAI, Uncertainty Avoidance Index				
	Neuroticism	0.59	Satisfaction	-0.49
	Corruption	0.43	Innovation	-0.45
	Conformity	0.26	Income Equality	-.025

Results of these meta-analyses signify the importance of cultural dimensions as significant predictors of many emotions, attitudes, and behaviors. At the time of the above studies, Long-term Versus Short-term Orientation, LTO, was a relatively new variable. Likewise, Indulgence Versus Restraint, IVR, had been only recently defined by Minkov (2007; 2011). Therefore, neither LTO nor IVR were included in the comprehensive work by Taras, Kirkman, and Steel (2010).

Other studies (Getz & Volkema, 2001; Davis & Ruhe, 2003; Seleim & Bontis, 2009; Tong, 2014; Yeganeh, 2014) from Western, Middle Eastern, and Asian perspectives have also reported findings relating behavior to dimensions of culture. This study rests on a methodology utilized in several previous studies applying Hofstede's framework of cultural dimensions used to predict dependent behavioral measures. Lanier (2011; 2013; 2018) previously employed linear regressions to study behavior within nations. These techniques revealed interactive relationships (or convolutions, now referred to as "Hofstede Pairs") among two cultural dimensions that were otherwise masked by the independent variables. Such relationships may exist among cultural dimensions in the context of studying other behaviors, and this study serves as encouragement to such exploration.

The nature of cultural dimensions suggests that, although independent by design, some combination of such variables must be at work in any given context. This is intuitive to anyone who has spent time in a culture other than their own. It is not merely one variable that is of interest for the traveler, but a unique combination of differences that make for that unique experience. Therefore, previously unexplored Hofstede Pairs were expected to provide improved modeling information.

Another analogy: A single one of the five senses would not be considered sufficient information to describe any experience. Neither would a single dimension of culture be sufficient to describe any behavior. Therefore, it is the combination of variables, indeed the *relationship among variables*, that should prove useful in describing behavior.

METHODOLOGY

The general methodology considered appropriate for this study included correlations and least squares linear regression. Of particular interest was the possibility of discovering Hofstede Pairs that would be especially useful in explaining the variability within a dependent variable. Therefore, after initial model replications, the primary new research question revolved around interactions of variable pairs.

Moreover, useful mathematical convolutions in the form of Hofstede Pairs were discovered for studies of international behaviors regarding beverage consumption (Lanier, 2011; 2013), happiness (Hordvik, 2018), and corruption (Lanier, 2018). Therefore, similar cases might exist when studying other international behaviors, and perhaps new behavioral models could be constructed.

As part of this methodology, a test case from rocket science was used to demonstrate the usefulness of paired variables. In the realm of physical sciences, many variable relationships are completely known. This test case may serve as a way to quantify some potential benefits of Hofstede Pairs. Perhaps more importantly, the case should quantify the potential risk of ignoring such pairs.

Correlations and Regressions

In each of the previous studies, the first step was to create a correlation matrix including the dependent variable and all six of Hofstede's Cultural Dimensions. Next, linear regressions were

performed to construct a prediction equation for each of the independent cultural variables. These single-variable prediction equations took the following form:

$Y = a + b_iX_i + e$, where X_i represents one of Hofstede's six cultural dimensions, and i = 1 to 6.

The first two research questions were, "Are correlations between the dependent variable and Hofstede's Cultural Dimensions stable, as reported by earlier research?" and "Are Hofstede's Cultural Dimensions significant predictors of the dependent variable in the constructed datasets, as previously observed by other researchers?" To replicate most of the studies reviewed in the literature, the multi-variable equation was purely additive. Using only Hofstede's six dimensions resulted in

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e$

However, interaction effects – mathematical convolutions – were examined of the form

$CPI = a + b_{ij}X_iX_j + e$, where i = 1 to 6, j = 1 to 6, and $i \neq j$

or more simply $CPI = a + b_{ij}X_{ij} + e$, where X_{ij}, is a convolution of functions X_i and X_j . The term Hofstede Pair represents each given convolution. Fifteen such Hofstede Pairs exist:

PDI*IDV, PDI*MAS, PDI*UAI, PDI*LTO, PDI*IVR
IDV*MAS, IDV*UAI, IDV*LTO, IDV*IVR
MAS*UAI, MAS*LTO, MAS*IVR
UAI*LTO, UAI*IVR, and
LTO*IVR (interestingly this last pair is highly significant in two of the three initial studies).

The third, and perhaps most compelling, research question was "Do one or more Hofstede Pairs act as a statistically significant predictor of the dependent variable?" In theory, a new compound variable could displace one or more of the commonly identified cultural dimensions predicting consumption, corruption, or happiness. The null hypothesis is that such a variable does not exist (i.e., b_{ij} is not significantly different from zero).

Each pair of cultural dimensions, X_iX_j , represents a cross-product potentially resulting in a beneficial interaction effect between two cultural dimensions. That is, the function X_i and the function X_j can be expressed as a third function X_{ij} . Such an interaction may be referred to as a convolution of the original functions, and defines the term Hofstede Pair for this study.

For mathematical purposes, it is important to note here that each of Hofstede's Cultural Dimensions does in fact behave as a 'function.' That is, for each participating country there is only one value provided for each dimension. It is not possible for a country to have two values for Power Distance Index for example.

Finally, the fourth research question was "Does a parsimonious model for predicting the dependent variable include one of the studied Hofstede Pairs?" The expectation was that a statistically significant model constructed using stepwise regression procedures exists. However, whether or

not one of the paired variables X_{ij} would be useful was completely unknown at the outset of each study.

Theoretically, these formulae could be extended further to include trios of variables, X_{ijk} and even more complex functions. Future studies could potentially make pragmatic use of such constructions. However, this study was limited to pairs of variables to simplify the interpretation of outcomes.

Test Case

A test case from the physical sciences – rocket science to be specific – allowed for a comparison between regression models with and without paired variables. The variable *momentum* was used as the dependent variable. The singular pair of variables producing calculations of momentum are *mass* and *velocity*. Typically, mass is expressed in kilograms, kg, and velocity is expressed in meters per second, m/s. The mathematical product, interaction, or convolution of this pair of variables (similar to Hofstede Pairs) yields momentum in kgm/s also called a Newton second.

That is, mass*velocity = momentum which is a completely known relationship in physics.

The value offered by this example would be to effectively analyze how least squares linear regression accounts for known relationships between variables and variable pairs. Additionally, pedagogical value existed because the relationship between mass, velocity, and momentum is widely known. Quantifying the risks of ignoring variable pairs, or the benefits of including them - especially Hofstede Pairs but also any variable pairs - is the primary goal of applying this methodology.

FINDINGS

The first research question of interest was, "Are correlations between the dependent variable and Hofstede's Cultural Dimensions stable, as reported by earlier research?" This was found to be true in each study of consumption (Lanier, 2011; 2013), happiness (Hordvik, 2018) and corruption (Lanier, 2018), and findings were presented in each of those articles.The purpose of this study was not to replicate those studies, but rather to identify a pattern in the results across the three studies. Verification of this first research question lays the foundation for each of the next questions.

However, the physics test case was new to this study. Correlations were performed and analyzed in a similar fashion to the initial studies of Hofstede Pairs:

Table 2: Correlations among momentum, mass, and velocity

(n = 41)	*Momentum*	*Mass(kg)*	*Velocity(m/s)*
Momentum	1		
Mass(kg)	-0.711	1	
Velocity(m/s)	0.532	-0.967	1

The second research question was, "Are Hofstede's Cultural Dimensions significant predictors of the dependent variable in the constructed datasets, as previously observed by other researchers?" Again, the findings in all three cases were consistent with published studies. Naturally, different variables were found to be statistically significant predictors of consumption, happiness, and corruption. However, the pattern of Hofstede's Cultural Dimensions predicting outcomes was consistent across studies.

In the physics test case, regressions were performed and analyzed in a similar fashion to the initial studies of Hofstede Pairs:

Table 3: R-square calculations dimensions when predicting momentum in isolation (alone).

Momentum (n = 41)	Mass(kg)	Velocity(m/s)
Coefficient of Determination	0.506*	0.283*
Probability	< 0.0001	< 0.0005

This table shows the prediction strengths and significance of mass and velocity for momentum.
**Indicates very strong statistical significance.*

To this point, one could be satisfied that findings were consistent with previously described relationships between consumption, happiness, corruption and cultural dimensions. However, the third research question asks, "Do one or more Hofstede Pairs act as a statistically significant predictor of the dependent variable?" Alternatively stated, "Do interaction effects exist between cultural dimensions thereby improving prediction models of the same form when predicting the consumption, happiness, and corruption?" To answer this question, one must study pairs of variables.

In each of the previous studies, at least one or two Hofstede Pairs showed promise. An interesting interaction between LTO and IVR was found to be significant in two of the three studies. The analyses of this research question established two new pieces of evidence in each study:

1. Hofstede's Cultural Dimensions were significant predictors in each case.
2. Prediction equations could likely be improved and refined when Hofstede Pairs were included in the regression models.

The results in Table 4 demonstrate the convolution represented by mass*velocity. The Hofstsede Pairs (also a convolution) behaved similarly, and in many ways the magnitude was similar(!):

Table 4: Selected models from a comprehensive search for interactions

(n = 41) Predictor variables	Model's R-square	Statistical Significance	Change in R^2 due to interaction
Mass(kg)	50.6%	$p < 0.0001$	n/a
Velocity(m/s)	28.3%	$p < 0.0005$	n/a
Mass*Velocity	100.0%	$p = 0.0$	+21.1

This table shows univariate models to predict momentum, and one convolution.

Often the contributions of predictor variables may be expected to 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. This synergetic effect could be explained by mathematical convolution, and was present in some Hofstede Pairs.

Finally, the fourth research question could be answered. It was, "What form does a parsimonious model for predicting the dependent variable take, and does such a model include one of the studied Hofstede Pairs?" Stepwise linear regression procedures were employed to conduct the analyses. In the previous studies LTO and IVR appeared to contribute little or nothing to the model's predictive power when used in isolation. Yet the compound variable LTO*IVR was one of two Hofstede Pairs significant in predicting happiness, and represented the second-most significant contribution to predicting corruption.

In the physics test case, when the compound variable mass*velocity was used to predict momentum, there was an increase of about 14% in effectiveness of the model over using mass and velocity in isolation (an increase of 0.122 in the Coefficient of Determination, R-square). Tables 5 and 6 present the regression results:

Perhaps obviously, momentum is predicted perfectly by the product pair mass*velocity because momentum is defined by this very product. However, it is helpful to see how this progression of steps follows closely the patterns established in each previous study. First, correlations between variables potentially involved. Then results that pairs of variables (mass*velocity in the test case, but Hofstede Pairs when predicting consumption, happiness, or corruption) offer significant model improvements over regressions with the independent variables alone.

Table 5: Linear regression results using mass and velocity as predictors (unpaired)

Analysis of Variance, R-square = 0.878

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1.14E+20	5.71E+19	136.89	4.29E-18
Error	38	1.59E+19	4.17E+17		
Corrected Total	40	1.3E+20			

Variable	Parameter Estimate	Standard Error	F-Value	Pr > |t|
Intercept	1.76E+10	1.16E+09	15.17909	1.02E-17
Mass(kg)	-6566.29	481.87	-13.6267	3.31E-16
Velocity(m/s)	-1255000	116467.1	-10.7756	4.11E-13

This table shows the Analysis of Variance when Mass and Velocity are the lone predictors of Momentum

Finally, the recognition that a single pair (or Hofstede Pair) of variables may result in a better model than the full unpaired model.

Table 6: Linear regression results using the product pair mass*velocity as a predictor (paired)

Analysis of Variance, R-square = 1.0

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	1.3E+20	1.3E+20	2.45E+32	0
Error	39	2.07E-11	5.31E-13		
Corrected Total	40	1.3E+20			

Variable	Parameter Estimate	Standard Error	F-Value	Pr > |t|
Intercept	1.43E-06	2.22E-07	6.453079	1.22E-07
Mass*Velocity(kgm/s or Ns)	1	6.39E-17	1.57E+16	0

*This table shows the Analysis of Variance when Mass*Velocity is the only predictor of Momentum*

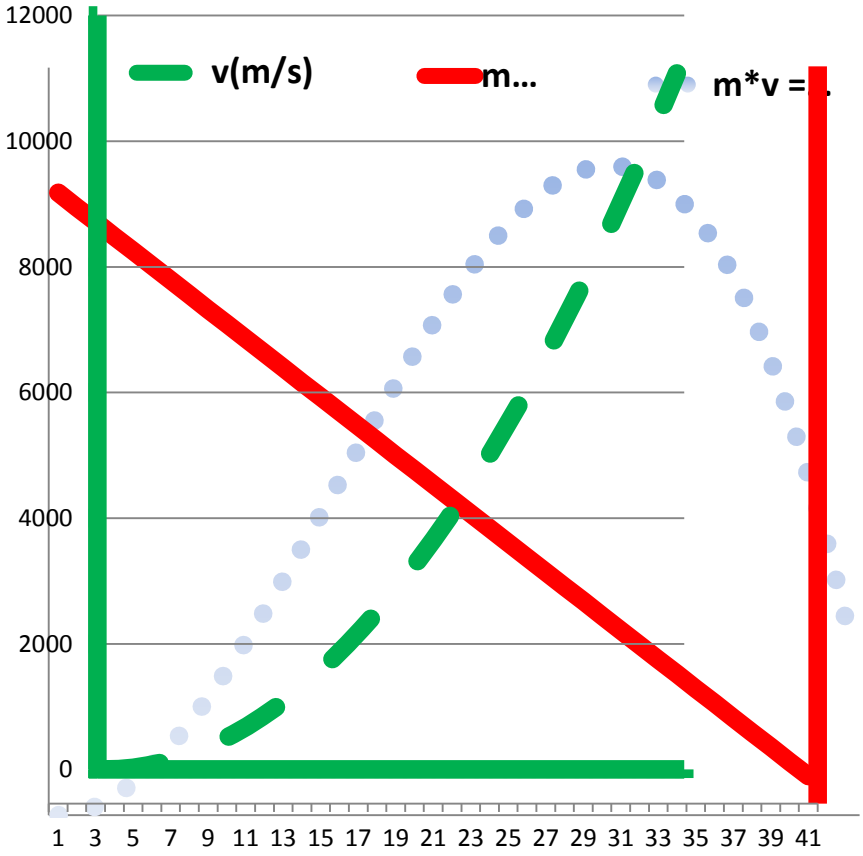
CONCLUSIONS

This study has taken a broad view of the relationships between Hofstede Pairs and 2010 product consumption data from The Coca-Cola Company; relationships between Hofstede Pairs and 2017 national data from the World Happiness Report; relationships between Hofstede Pairs and the 2017 Corruption Perception Index; and finally, relationships between paired mass and velocity to predict momentum (a known calculation). Hopefully, 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.

Upon further review of the data, one discovers that each Hofstede Pair contained two, often inversely related, but related variables similar to mass and velocity (see Table 2). The statistically significant contribution of Hofstede Pairs may have been masked by the nature of these inverse relationships (as the potential seemed limited for either component of a Hofstede Pair to contribute in predictive modeling of consumption, happiness, and corruption.). However, in each case a significant interaction between two cultural dimensions was observed:
A Hofstede Pair of Individualism vs Collectivism with Uncertainty Avoidance Index enhanced the modeling of consumption in the first study (Lanier, 2011; 2013); a Hofstede Pair (Individualism vs Collectivism with Indulgence vs Restraint) greatly enhanced the modeling of happiness; and the Hofstede Pair of Long-term Orientation with Indulgence vs Restraint enhanced the understanding of corruption.

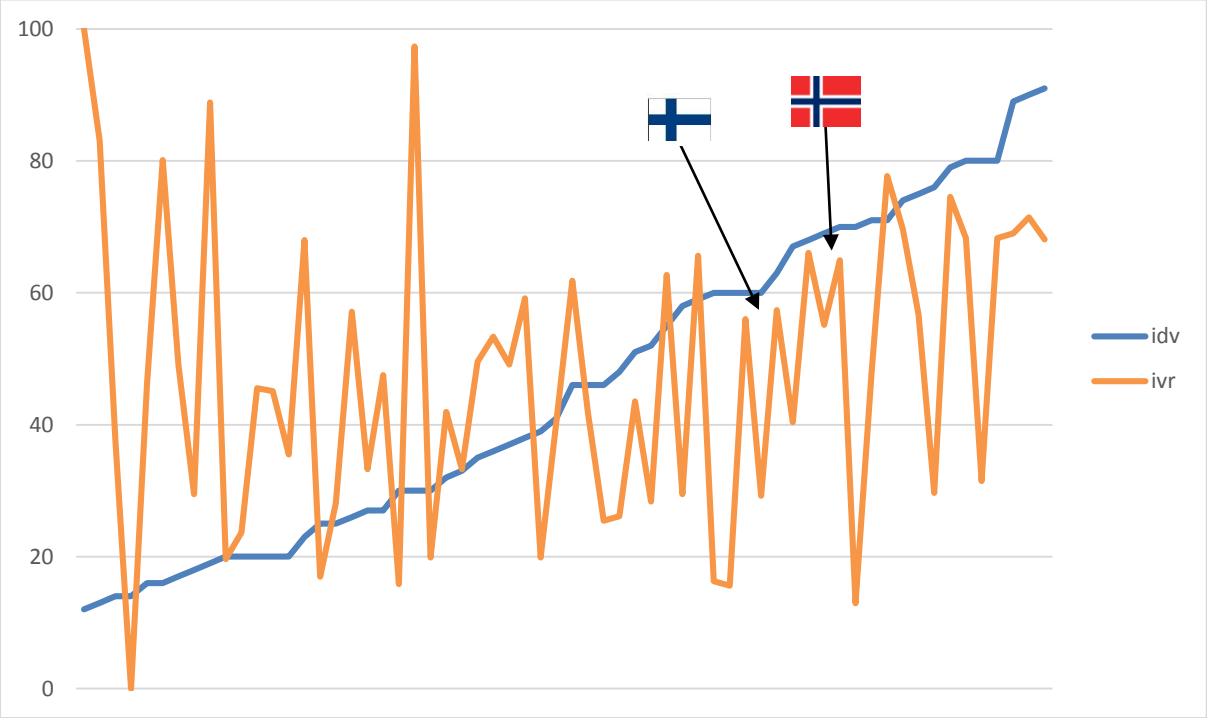
For comparative purposes, Figure 1 demonstrates the nature of the inverse relationship between mass, velocity, and momentum. 100% of the variability in momentum is explained by the product pair mass and velocity. This relationship exists by the definition of momentum. Furthermore, momentum peaks slightly to the right of the intersection between the two independent variables.

Figure 1: Mass and velocity are inversely related; momentum is a function of the two.



Similarly, Figure 2 represents the Hofstede Pair of Individualism vs Collectivism with Indulgence vs Restraint. Variability in this Hofstede Pair explained 60% of variability in the dependent variable measure of happiness (R-square = 0.60). This variable alone produced a more predictive regression model than those found in other studies reviewed. Where are the happiest countries found? Norway and Finland are the happiest, found slightly to the right of the intersection between these two variables.

Figure 2: Happiness and the Hofstede Pair IDV*IVR are directly related; sorted by IDV



When one interaction effect can be demonstrated among Hofstede's cultural dimensions, the promise exists for more. Hofstede Pairs in other contexts, with other variables, may help researchers understand complex cultural relationships. These cases support the development of new predictive equations for a variety of purposes. Business as a field is rich with data, but much of the available information may not be used to its fullest purpose. Opportunities abound for the business researcher to glean information from many sources of data, and produce meaningful models that enhance our understanding of human interactions.

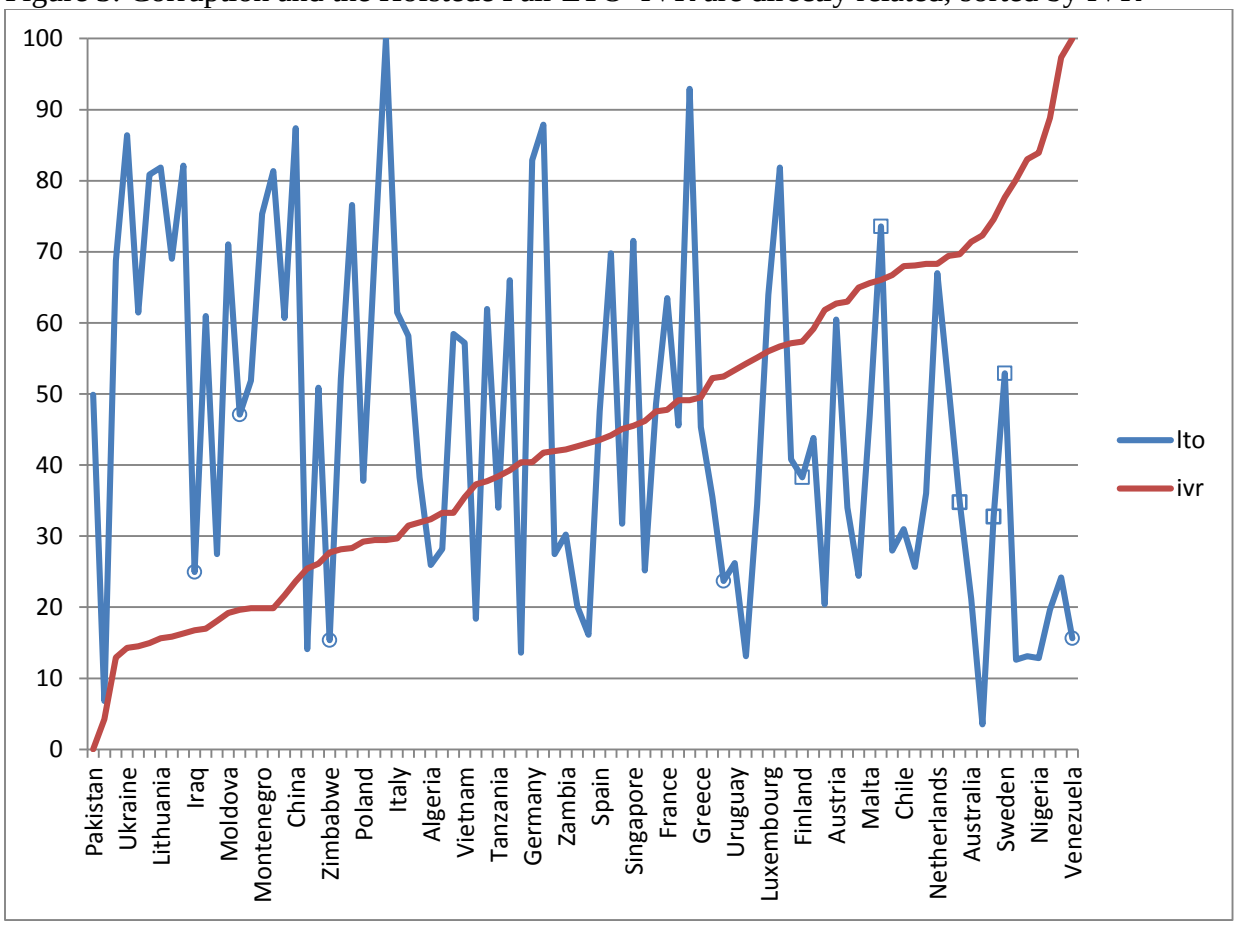
When studying the Corruption Perception Index, the Hofstede Pair LTO*IVR showed powerful potential. Extremes of neither LTO nor IVR appear to be ideal for minimizing corruption. The concept "more is better" - if LTO is good then higher is better, or if Indulgence is helpful then let's be more so – cannot apply to inversely related variables. More of one is, by definition, less of the other. Therefore, a balance must be struck between the two variables.

The interaction among these two variables is required for better understanding of corruption. If extremes on these scales are shown to be problematic, perhaps there is a point of equilibrium balancing the forces of corruption. People with a long-term view may indulge in corrupt behavior partly because participation in corrupt systems has been unfortunately rewarded over long periods of time. Long-Term Orientation then is not 'good' or 'bad' but interacts with other cultural elements to deter or encourage corruption.

Only continued research will disclose the nature of relationships among these variables. In the case of modeling corruption, a Hofstede Pair of Long-term Orientation with Indulgence vs Restraint

may have uncovered the potential for other paired variables. These potential interactions and statistical techniques may facilitate research in any behavioral setting. Figure 3 demonstrates the nature of the inverse relationship between LTO and IVR.

Figure 3: Corruption and the Hofstede Pair LTO*IVR are directly related; sorted by IVR



The risk lies in leaving Hofstede Pairs and other mathematical convolutions unexplored. It is reasonable to conclude that the evolution of many other socio-political or socio-emotional behaviors take place differently among nations. Cultural variables are at least partially, if not largely, responsible for these patterns. What other behaviors might benefit from similar modeling?

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 were scarce. Therefore, the practical implications of these studies of Hofstede Pairs should be clear for business researchers, economists, political scientists, and many multinational companies. Theoretical implications are clear for researchers in psychology, sociology, business, and other fields: Interaction effects among cultural dimensions deserve further study. The cultural dimension Indulgence vs Restraint was only published in 2010, and it may be a powerful construct for better understanding culture in the context of behaviors.

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