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INFLUENCING CONSUMER ENGAGEMENT IN ENVIRONMENTALLY RESPONSIBLE BEHAVIOR

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ABSTRACT

The objective of green marketing campaigns is to influence consumer behavior by communicating the benefits of engaging in environmentally responsible behavior (ERB), such as recycling, conserving energy, purchasing locally or regionally grown/raised food, etc. Marketers use a variety of communication channels to diffuse these influential messages to their target segments. These messages convey a range of individual and socially collective benefits of ERB. They commonly stress its behavioral advantages in one of two contexts: ecological or economical. Yet, an insufficient amount of research exists towards understanding if one (or either) context is more influential in increasing the likelihood of consumers' willingness to engage in this increasingly essential social behavior. The findings of this study suggest that although communications rooted in a context presenting the economic upside of environmentally responsible behavior have a greater influence on consumers' likelihood to recycle, environmentally themed messages were seen as being more honest.

JEL: M3

KEYWORDS: Green Marketing, Consumer Behavior, ERB, Advertising, Public Policy

INTRODUCTION

Green marketing is a concept that has become an intersection for traditional advertising, social media, cause-related marketing, and public policy concerns. The idea of expanding and applying basic marketing principles and approaches to non-commercial organizations, as well as marketing to individuals who follow a more natural or organically oriented lifestyle, has existed for almost half a century (Kinnear, Taylor, and Ahmed, 1974). However, the popularity among academic researchers and marketing practitioners of this once borderline disciplinary niche is increasing at a very rapid pace these days. This is partly attributable to increased media coverage of the warnings issued by the scientific community regarding the Earth's climate and environment (Hanas, 2007, Rosenthal and Revkin 2007, Trenberth 2011). United Nations' Intergovernmental Panel on Climate Change Chair R. K. Pachauri recently declared that although there were many solutions to limiting climate change, all that was needed is the will to change (IPCC, 2014). The common theme of these reports and studies is that if human activities are not drastically altered immediately, there is a great likelihood of life on Earth, including human life, becoming extinct during the 21st century (Stern 2006, Swim, Clayton, and Howard, 2011, Hajat, Vardoulakis, Heaviside, and Eggen, 2014).

Studies have shown that increases in media coverage of events precede increases in the importance the public attaches to them (Sharp, 1992, Smith, 1987). Not surprisingly, calls for such imperative action regarding the environment have received widespread media exposure in hopes that the public will appreciate the consequential severity of not changing their environmental behaviors. The majority of the attempts to increase media coverage via public service announcements, electronic (including online and

mobile) and print advertisements, and other similar approaches have tended to stress either the economical or the ecological benefits of engaging in ERB. However, an uncertain financial future may have consumers less concerned with the green of their environment and more with the green (or lack thereof) in their pockets. To help offset this argument, many pro-ERB communications suggest the immediate realization of financial savings for consumers. A magazine ad, for example, may point out how the purchase of a single reusable water bottle and filter (as opposed to repeatedly buying bottled water) is not only greener ecologically, but is economically sounder as the financial costs involved in reusable bottles are only a fraction of the money consumers spend on bottled water every year (Clapp, 2012).

If consumer behaviors are to be successfully altered in this area, those advocating ERB would more effectively be able to serve their cause if they focused on the more constructive of these two different streams of thought. It is with this thought in mind that the purpose of this study is to determine whether consumers perceive an ecologically or an economically themed communication to be more constructive in either persuading non-ERB consumers to re-evaluate their activities and in re-enforcing existing ERB consumers to continue theirs. This current study contributes to the field of Marketing, specifically Green Marketing, by addressing the impact of the motivational framing of internal and external facilitators on the willingness of consumers to engage in environmentally responsible behavior. An examination of the relevant academic research on the areas applicable to this study will be provided next, followed by an overview of the methodology used to collect the data. After this, the authors will present their summarization and interpretation of the results achieved through statistical data analysis. Lastly, concluding comments will discuss the implication of these results and possible directions for further research on this topic.

LITERATURE REVIEW

A tremendous amount of work exists on environmentally responsible behavior regarding organizational and corporate actions. Much is focused on consumer impact and inference of organizational environmentally ethical behavior (Vitell, 2015). However, too few articles directly address consumers' personal performance of ERB. Stone, Barnes, and Montgomery (1995) define environmental responsibility as, "a state in which a person expresses an intention to take action directed toward remediation of environmental problems, acting not as an individual concerned with his/her own economic interests, but through a citizen consumer concept of societal-environmental well-being." This study helps to fill the void of research on direct consumer personal ERB and what drives it. The majority of ER studies have been concerned with the determinants of consumer ERB (Schwartz, 1977, Balderjahn, 1988, Diamantopoulos, Schlegelmilch, Sinkovics, and Bohlen 2003). Several studies conducted outside of North America focused on identifying and modeling the determinants of environmentally conscious behavior (Abdul-Muhmin 2007, Collins, Steg, and Koning, 2007). Marketing's role in repositioning environmentally responsible behavior as being the norm, instead of the exception, was the subject of Rettie, Burchell, and Barnham's (2014) research.

Minton and Rose's (1997) study on the effects of consumers' environmental concerns on the likelihood of environmentally friendly behavior found the primary driver of such behavior to be the personal norm of the individual, while the individual's attitude drove their intent. Schwartz and Miller (1991) reported that according to the 1990 Roper Organization's Green Gauge Study, the three most environmentally active groups were those: 1) higher in income and education; 2) female; and 3) had white-collar (either executive or professional) employment. Diamantopoulos, et al (2003) further showed that females are more likely to undertake recycling activities more often and display greener shopping habits than their male counterparts and that older people are more likely to perform higher levels of recycling activities. At the same time, the findings of do Paço, A. M. F., and Reis (2012) indicate that gender made no difference regarding skepticism of environmentally themed advertising. Similarly, Neuman (1986) claimed that spousal influences do not shape an individual's environmental concern.

Abdul-Muhmin's (2007) study, which serves as the primary conceptual inspiration for the present study, utilizes not the concept of behavioral intentions, but rather behavioral willingness; i.e., not whether individuals intend to perform the desired behavior, but whether they would be willing to perform environmentally responsible behaviors, such as recycling. This research indicated that psychological consequences serve as a key determinant of willingness. Hence, consumers' willingness to engage in recycling may simply be a matter of their understanding the consequences of doing such. Research conducted by Gifford and Comeau (2011) found that the use of motivational framing rather than sacrificial framing increased climate-related engagement and activation of community members to help mitigate climate change. Hornik and Cherian (1995) found that consumer understanding and commitment to recycle (internal facilitators), as well as monetary rewards and social influence (external facilitators), were the two best predictors of consumer recycling behavior.

Perceived honesty is a determinant of the extent that consumers scrutinize messages, according to Priester and Petty (1995). They found that consumers with a high need for cognition (NFC) were not impacted by the source of the message, while those with a low NFC did not scrutinize those messages they assumed were honest. Much of the existing research on the role honesty plays in green marketing is, not surprisingly, limited to a product context, (Newell, Goldsmith, and Banzhaf, 1998, Nyilasy, Gangadharbatla, and Paladino, 2014, Xie, 2014). However, a recent study by do Paço and Reis (2012) found that the greater the level of environmental concern a consumer had, the greater their level of skepticism toward green claims on packages or featured in ads. Tucker, Rifon, Lee, and Freece (2012) claimed that consumers with an existing positive attitude towards environmental protection were more likely to be receptive to ecologically themed ad claims. These studies, as do the majority of green marketing and consumer behavior research, focus on product claims of environmental responsibility (i.e., eco-friendly products) that target consumers, not on the environmental responsibilities of the consumers themselves as influenced by their attitude toward environmentally or economically themed messages, which is the focus of the present study.

Recycling was chosen as the desired environmentally responsible behavior given its role as the primary weapon in the battle against the many detrimental environmental issues facing society (Wan, Shen, and Yu 2014). It was also selected due to the lack of existing research on the various marketing strategies that have been initiated to increase its practice. McCarty and Shrum (1994) found that attitudes towards its perceived inconvenience negatively influenced the likelihood of recycling behavior. Ramayah and Rahbar (2013) claimed recycling behavior is significantly influenced by resistance to change. Domina and Koch (1999) reported, almost two decades ago, that increasing awareness of, and sensitivity to, environmental issues has triggered a dramatic escalation in consumer recycling of product waste. Simmons and Widmar's (1990, p. 13) highly cited prophetic article stated in its abstract (emphasis added): "...recyclers were more likely to hold to a conservation ethic or to feel a sense of responsible action. However, such positive attitudes might not lead to corresponding behavior if individuals professed *a lack of knowledge about recycling*... Thus, public education programs should provide a mix of motivations for recycling, as well as methods for overcoming informational and attitudinal barriers."

DATA AND METHODOLOGY

The focal construct of this study is consumer willingness to engage in environmentally responsible (consumer) behavior ($WILL_{ERCB}$). It will be operationalized through the practice of recycling. The study's measurements focuses on the strength of the relationship between consumers' attitude towards a print ad depicting either the economical or environmental benefits of this practice and their willingness to engage in various forms of recycling, including recycling itself, their willingness to encourage others to recycle, and their willingness to purchase either recycled or recyclable products. This study proposes that a consumer's economical ($MESS_{ECON}$) attitude (i.e., saving money) is a stronger motivator to engage in recycling than is their environmental ($MESS_{ENV}$) attitude (i.e., saving nature). Further, it suggests that

how honest they perceive the actual message being delivered to be has a positive effect on the desired behavior. One constructs is used to corroborate the importance (RECY_{IMPO}) people place on recycling have a positive influence on the willingness to recycle. This leads to the following four hypotheses:

H₁ There will be a positive relationship between ERB messages (MESS) and consumer willingness to engage in environmentally responsible behavior (WILL_{ERCB}).

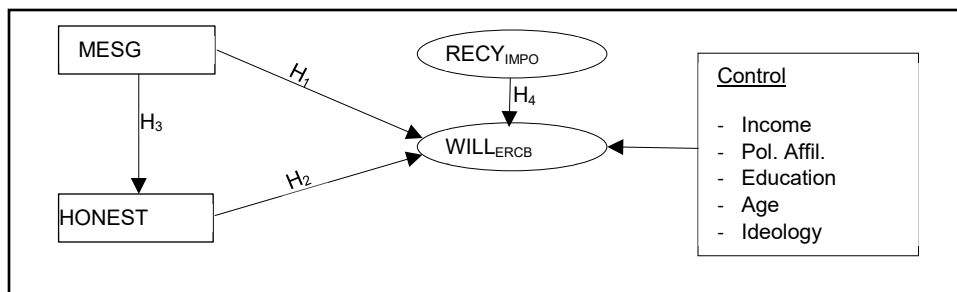
H₂ There will be a positive relationship between Perceived Honesty (HONEST) and consumer willingness to engage in environmentally responsible behavior (WILL_{ERCB}).

H₃ The relationship between ERB messages (MESS) and Perceived Honesty (HONEST) will be significantly stronger for those with an economically themed message.

H₄ There will be a positive relationship between consumers perceived importance of recycling (RECY_{IMPO}) and their willingness to engage in environmentally responsible behavior (WILL_{ERCB}).

There are two latent variables used in the present research, the willingness to engage in environmentally responsible (consumer) behavior (WILL_{ERCB}) and the importance of recycling (RECY_{IMPO}). These two variables are measured through different indicators that capture perceived values. The variables, Honesty (HONEST) and Message (MESS) are measured using single indicators. The variable Message (MESS) is a dummy variable with two distinct values: (1) for the economic message and a (2) for the environmental message. Besides the variables mentioned above, five control variables are included into the research model: Income, Political Affiliation, Education, Age, and Ideology. A conceptual model is shown below:

Figure 1: Conceptual Model



A basic survey was compiled and distributed in person to residents of two cities in south Texas. One-hundred and seven (107) surveys were distributed, of which eighty-nine (89) were determined viable after the data was coded, entered, screened, and cleaned. This resulted in a response rate of eighty-three percent (83%). Economically themed messages were provided, at random to 46 of the respondents (52%), while the remaining 43 volunteer respondents (48%) received the ecologically themed version.

Participants were informed that their participation was voluntary, that they would not be compensated in any manner for their involvement, and that their responses were completely confidential and would only be used for the purpose of this study. Study participants were randomly provided with one of two versions of a survey. One version contains a mock print ad showing the economic benefits of recycling, including its impact on the economy (i.e., jobs, revenue, and payroll created). The other version extolls the environmental benefits of recycling (i.e., number of trees saved, amount of savable water, and energy savings). Demographic information regarding age, marital status, household ownership, type of home, the presence of others in the household (roommate, spouse, children and/or grandchildren), education, income levels, as well as psychographic information (political party affiliation and ideology) was collected from all participants. Additionally, the consumer-respondents' attitudes towards the environmentally responsible behavior of recycling were measured using items adopted from Bohlen, Schlegelmilch, and Diamantopoulos' (1993) and Stone, Barnes, and Montgomery's (1995) well-

respected and established environmental attitude scales. General demographic characteristics of the respondents are provided in Table 1 below.

Table 1: Respondent Demographic Attributes

Respondent Attribute	Attribute Categories	Percentage of Respondents
Age	Under 40 years old	58 (66%)
	Over 40 years old	31 (34%)
Education	Never attended college	10 (11%)
	Attended college	75 (85%)
	College degree	40 (45%)
Children	Graduate degree	04 (05%)
	No children	58 (66%)
	Have children	31 (34%)
Marital Status	Have grandchildren	14 (16%)
	Single	56 (63%)
	Married	25 (28%)
Income	Divorced	07 (08%)
	Did not provide response	01 (01%)
	Less than \$25,000	25 (28%)
	Between \$25-75,000	31 (35%)
	More than \$75,000	28 (31%)
	Did not provide response	05 (06%)

This table shows basic demographic characteristics (age, level of education, if they have children their marital status and current income level) of those who participated in the survey that was conducted for this research study. It indicates that the majority of the survey respondents are under age 40, college educated, childless, single, and make less than \$75,000 annually.

After completing these first two sections, respondents were randomly shown either an economically or an environmentally themed print advertisement to view. After a few minutes of studying the ad and its message, respondents voluntarily completed a 7-point Likert-scale questionnaires designed to measure (a) their attitude towards the advertisement's message and (b) the extent of their willingness to engage in recycling, encourage others to recycle, buy products made from recycled materials, and buy products that were recyclable. Copies of the advertisements are provided in the Appendix. The data was analyzed using WarpPLS 4.0 (Kock, 2011) software that analyzes data using variant-based structural equation modeling. This multivariate analysis is extremely useful as a predictive model in highly complex scenarios (Anderson and Gerbing, 1988, Hsu, Chen, and Hsieh, 2006). Partial Least Squares (PLS) is a variant-based structural equation modeling technique in which the overall model consists of an inner and an outer model. The inner model is represented by the relationships between latent variables while the outer model consists of the relationships between the indicators and their respective latent variables.

PLS does not provide a single or global goodness-of-fit criterion. Rather, an index of criteria to assess partial model structures is used to evaluate the overall model (Chin, 1998). A systematic application of these criteria is a two-step process that encompasses the assessment of both (inner and outer) models. The first step includes the evaluation of the outer model including the reliability and validity of reflective constructs. The second step focuses on the assessment of the inner model. It includes the variance explanation of endogenous constructs, effect sizes, and predictive relevance of the model.

RESULTS

For the first step and evaluation of the outer model a test for validity and reliability was conducted through the implementation of factor analysis, coefficients of reliability, Cronbach's alpha coefficients (Hair, Anderson, and Tatham, 1987), and average variance extracted (AVE) for each latent variable (Fornell and Larcker, 1981). The results of the validity and reliability tests for the reflective measurement model used for the perceptual control variables are presented in Table 1.

Convergent Validity explains how well the indicators associate to each latent variable, in other words, if the questions asked in the survey were understood by respondents in the same way intended by the designers (Kock, 2011). Convergent validity was measured using indicators loadings. Hair et al. (1987) allows that a model can have acceptable convergent validity when the *P* values associated with the loadings are lower than 0.05 and that the individual loadings are greater than or equal to 0.5. Table 2 shows that all the *P* values are significant at the 0.01 level and that all the loadings are greater than 0.5. Reliability explains how well the measurement instrument was designed and how well questions measure what it was intended to measure by the designers. In this study, reliability was measured by both composite reliability and Cronbach’s Alpha coefficients; both coefficients should be equal to or exceed 0.7 for the instrument to be deemed valid (Fornell and Larcker, 1981; Nunnally and Bernstein, 1994). The values achieved by the questions used in this research exceeded the minimum required levels. They are provided in Table 2 below.

Table 2: Reliability Results

	Component		Cronbach’s Alpha
	RECY _{IMPO}	WILL _{ERCB}	
RIMPO1	0.865***	-0.273	0.852
RIMPO2	0.745***	-0.227	
RIMPO3	0.867***	0.143	
RIMPO4	0.843***	0.104	
RIMPO5	0.641***	0.302	
WILL1	-0.273	0.884***	0.947
WILL2	-0.227	0.919***	
WILL3	0.143	0.957***	
WILL4	0.104	0.954***	

This table shows Convergent Validity and Reliability of the PLS Outer model. As can be observed all the individual indicator loadings for the latent variables RECY_{IMPO} and WILL_{ERCB} are greater than 0.5 and significant at the 0.01 level. Also, Cronbach’s Alphas for both latent variables are greater than the threshold of 0.7

Discriminant Validity confirms that questions that measure a specific Latent Variable in the measurement instrument are not confused with questions measuring a distinct Latent Variable in that same instrument. A combination of the Average Variance Extracted (AVE) and Latent Variable correlations measure discriminant validity; for each latent variable, the squared root of the AVE should be higher than any correlation involving that latent variable (Fornell and Larcker, 1981). The values achieved in this study regarding discriminant validity also exceeded minimum requirements. They are provided in Table 3 below.

Table 3: Average Variance Extracted (AVE), Square Root of AVE, and Correlation Results

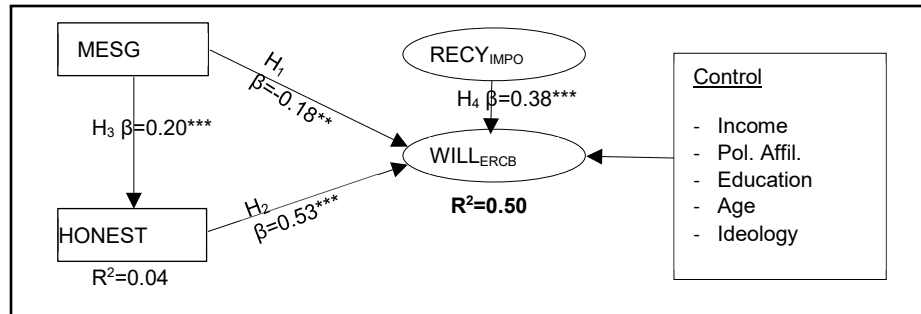
	CR	AVE	WILL _{ERCB}	RECY _{IMPO}
WILL _{ERCB}	0.962	0.863	0.929	
RECY _{IMPO}	0.896	0.635	0.538	0.797

CR – Composite Reliability; AVE – Average Variance Extracted. Diagonal elements are the square root of AVE; Off diagonal elements are the correlation between the constructs. This table shows Reliability and Discriminant Validity of the Outer PLS Model. A combination of the Average Variance Extracted (AVE) and Latent Variable correlations measure discriminant validity; for each latent variable, the squared root of the AVE should be higher than any correlation involving that latent variable

The second step and evaluation of the inner model include the analysis of the partial correlations betas (β) and R squares (R^2) or explained variance. Figure 2 illustrates the structural model with the results of the PLS analysis. In the model Betas (β) followed by three asterisks are significant at $P < 0.01$ in a one-tailed T-test; Betas (β) followed by two asterisk are significant at $P < 0.05$ in a one-tailed T-test; Betas (β)

followed by NS are non-significant. The $P < 0.05$ level can be seen as the upper threshold of acceptability (Rosenthal & Rosnow, 1991). The P values in the model were calculated using a re-sampling method called bootstrapping and 100 samples were set in WarpPLS for re-sampling (Kock, 2011).

Figure 2: Hypothetical Model with Results



As shown in Figure 2, Hypothesis 1 was supported with a beta of -0.18 at the .05 significance level, meaning that the economic message was significantly stronger than the environmental one. Hypothesis 2 was also supported by the statistical analysis with a beta of 0.53 at the .01 significance level, implicating that the more honest the message is perceived to be, the higher the willingness of the user to get involved in recycling. Hypothesis 3, even though it was significant with a beta of 0.20 at the .01 level of significance, the sign of the relationship was opposite of the expected not supporting it. Finally, Hypothesis 4 was supported with a beta of 0.38 at a .01 significance level, implying that people that think recycling is important the higher their willingness to get involved in recycling.

This study takes into consideration many control variables that are tested as part of the model that was presented in figure 1. The control variables are measured by adding them to the main PLS Model pointing to the dependent variable WILL_{ERCB}. The control variables are Income, political affiliation, education level, age, and ideology. None of the control variables had a significant effect at the $P < 0.05$ level on the main dependent variable WILL_{ERCB}. The first hypothesis, H₁, stated that the relationship between MESS and WILL_{ERCB} would be significantly stronger for the financial message than for the environmental message. Consistent with Hornik and Cherian's (1995) findings the statistical analysis shows support for H₁. Hypothesis 2 expected to find a positive relationship between Perceived Honesty and consumer willingness to engage in environmentally responsible behavior (recycling).

Data analysis supports H₂. The third hypothesis, H₃, that the relationship between the advertisement's message and its perceived honesty would be stronger when the context of the message was economical, was not supported by the statistical analysis of the data. This finding extends the consumer skepticism regarding environmental claims on product packaging (do Paço and Reis, 2012), it also contradicts Tucker, Rifon, Lee, and Freece's (2012), research that reported consumers with an existing positive attitude towards environmental protection were more likely to be receptive to ecologically themed ad claims. The upside here is the potential for future research that this dichotomy provides. The fourth hypothesis predicted that a positive relationship exists between consumer perception of the importance of environmentally responsible behavior (recycling) and their willingness to engage in such. As expected, H₄ was also supported by the statistical analysis, confirming that people who believe environmentally responsible behaviors, such as recycling, to be important are more willing to recycle and encourage others to do the same. The support of H₄ furthers Abdul-Muhmin's (2007) research on what motivates consumers to engage in personally engaging in such behavior. It also extends the research conducted almost twenty years ago by Minton and Rose (1997) on influencers of consumer attitude towards ERB.

CONCLUDING COMMENTS

The research presented begins to fill a gap in the existing literature regarding environmental marketing. Although this area has been in existence for several decades, only in these first decades of the twenty-first century is its importance beginning to be appreciated by academics and practitioners. A number of

variables are involved in driving consumer decision-making during ordinary times. However, given the potential results of the current global environmental situation, the impacts and consequences of which have not been experienced, there exists a plethora of potential future research that can and should be undertaken at once to determine behavioral drivers of consumer behavior regarding environmentally responsible behavior.

APPENDIX

Appendix A: Survey

Section I. General Demographic Information.

Section II. Views on Recycling. A seven-point Likert scale with the following endpoints.

To me, recycling is . . .

- 14. Bad / Good
- 15. Foolish / Wise
- 16. Not worthwhile / Worthwhile
- 17. Pointless / Necessary
- 18. Expensive / Valuable
- 19. Difficult / Easy
- 20. Inconsequential / Crucial

Section III. Importance of Recycling: A seven-point Likert scale using Strongly Agree/Disagree as endpoints.

- 21. Recycling is important to me.
- 22. Recycling can make a difference.
- 23. When I do not recycle, I feel guilty.
- 24. I encourage others to recycle.
- 25. I check product containers to see if they are recyclable before buying.
- 26. I participate in curbside recycling.

Section IV. Message opinion survey. A seven-point Likert scale with the following endpoints.

- 27. *Ineffective / Effective*
- 28. *Uninformative / Informative*
- 29. *Not Persuasive / Persuasive*
- 30. *Unfair / Fair*
- 31. *Dishonest / Honest*
- 32. *Not Influential / Influential*

Section V. Message influence likelihood to recycle. A seven-point Likert scale using Strongly Agree/Disagree as endpoints.

- 33. It makes me more willing to recycle.
 - 34. It makes me more willing to encourage others to recycle.
 - 35. It makes me more willing to buy products made from recycled materials.
 - 36. It makes me more willing to buy products that are recyclable.
-

Appendix B: Environmentally Themed Print Ad

DID YOU KNOW...?

Every ton of recycled paper saves 17 trees and 7,000 gallons of water.

Every ton of recycled newsprint or mixed paper saves 12 trees.

Every ton of recycled office paper is the equivalent of 24 trees.

Recycling aluminum requires 95% less energy than making it from raw materials.

Making recycled newspaper requires 40% less energy,

Making recycled plastics requires 70% less energy;

Making recycled glass requires 40% less energy.

A national recycling rate of 30% would reduce greenhouse gas emissions by the same amount caused by 25 million cars on the road.

A pound of recovered aluminum saves the energy resources required to generate about 7.5 kilowatt-hours of electricity; enough to meet the needs of Pittsburgh for six years.

RECYCLING
MAKES YOUR WORLD GREEN.

Appendix C: Economically Themed Print Ad

DID YOU KNOW...?

The US Recycling Economic Information Study reported that the recycle and reuse industry employs 1.1 million people, has an annual payroll of \$37 billion, and generated \$236 billion in sales.

In 2010, the United States sold recycled materials valued at over \$30 billion to over 154 countries.

Americans throw away enough aluminum cans each month to completely rebuild the entire U.S. commercial airline fleet.

The U.S. Scrap Recycling Industry, in 2011, employed almost 500,000 people, paid over \$26 billion in wages and generated over \$90 billion in revenue.

RECYCLING
MAKES YOUR WORLD GREEN.

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SKILLS NEEDED IN THE WORKPLACE: A COMPARISON OF THE RESULTS OF FEEDBACK FROM REPRESENTATIVES OF LARGE AND SMALL BUSINESSES IN NEW JERSEY

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ABSTRACT

The purpose of this research is to determine what skills small and large business representatives in New Jersey believe are important for the workplace. There were 120 small businesses and 71 large businesses representatives surveyed. Written communication skills, adapting to change and being flexible, sales presentation experience, networking, and enthusiasm were the top skills identified by respondents from small businesses as important or very important. Attitude/professionalism; work ethic; ethical understanding; respecting and valuing diversity; interpersonal skills; enthusiasm; teamwork skills and adapting to change and being flexible were the top skills identified by large business respondents as important or very important. There were a significantly greater percentage of respondents from mid to large size businesses rating the following skills as important or very important –attitude/professionalism ($p<0.01$); work ethic ($p<0.01$); adapting to change/flexibility ($p<0.05$); respecting and valuing diversity ($p<0.01$); ethical understanding($p<0.01$); enthusiasm ($p<0.10$); interpersonal skills ($p<0.05$); teamwork ($p<0.05$) locating, organizing, and evaluating relevant information ($p<0.05$); thinking creatively to solve problems ($p<0.10$); managing time ($p<0.10$); and speaking/oral communication skills ($p<0.10$). There were a significantly greater percentage of respondents from small businesses rating networking ($p<0.01$), knowledge of global issues/international policy ($p<0.01$), and sales experience as important ($p<0.01$) or very important than respondents from mid to large size businesses. The authors conclude that the differences in ratings of the skills valued by small and large businesses are due to the traits of an entrepreneur and structure required of the human resources of a large business.

JEL: J10, J11, J24

KEYWORDS: Workplace Skills, Small and Large Business Skills, Assessment

INTRODUCTION

There is now a greater importance to identify workplace skills that college graduates need in order to be successful in today's workplace. This is due to the changes in the job market as a result of global competition, increased use of technology, reframing of jobs, and competition for jobs within the United States. These changes influence the competencies and skills that graduates of college business programs need to be successful in the workplace and go beyond the basic knowledge that was acceptable in the past (Bridgeland, Milano, & Rosenblum, 2011; Preparing 21st Century Students..., (n.d.). Concerns for students' workplace preparation gain greater attention in the current environment of accountability; leaders in higher education have to address how well college graduates are being prepared for work in the global economy. Accrediting bodies, parents, students and business leaders are calling for greater accountability on the part of higher education faculty regarding the quality and relevance of curricula,

assessment of student-learning outcomes, and commitment to continuous improvement in course content to offer students the knowledge and skills needed in the workplace (Kuh, 2014).

In order to determine the skills college business graduates need for employment in New Jersey, a survey was conducted of representatives of small, mid-sized, and large businesses in New Jersey to determine the knowledge, skills, and competencies needed for success in the workplace. The results of this study provide feedback to help business faculty when they revise course content, provide career guidance, and plan internships for students. In addition, the feedback from business leaders helps guide discussions on assessment of student learning and recommendations for revision to the business curricula in order to a) align the content of the business curricula with the needs of the business community and b) to ensure that graduates receive a background in the knowledge, skills and competencies necessary for workplace success. The remainder of the paper is organized as follows: the relevant literature review, data and methodology used in the study; the results, and concluding comments.

LITERATURE REVIEW

Changing global economic forces, innovations in technology, and the growth of cultural diversity in the workplace create a business environment that is different from that of a generation ago. Often the calls for changes in what students learn are influenced by various stakeholders who have an interest in the students' learning outcomes.

Stakeholders of a College Education

An example of a stakeholder influencing the faculty's development and revision of curricula are the accrediting bodies which develop standards that set thresholds and challenges for higher education and call for proof of the activities through tracking continuous improvement (Henard & Roseveare, 2012). In business an example is in The Association to Advance Collegiate Schools of Business (AACSB) report *Eligibility Procedures and Accreditation Standards for Business Education* (2016), which requires business programs to provide assurances of student learning to the external stakeholders and students, who are consumers of academic programs. As part of the assurances of learning in AACSB, business faculty must develop, monitor, evaluate, and revise the substance and delivery of the curricula, and assess the impact of the curricula on learners. This curriculum management includes input from faculty, administrators, students, alumni, and members of the business community served by the college to align the skills students bring to the workplace with those that businesses need (Hart, 2015; Fischer, 2013).

In addition to accrediting organizations, colleges and universities have many stakeholders: students, faculty, students' parents, employers, public officials, community leaders, and the general public. These stakeholders share a common need to know whether institutions of higher learning are preparing students' adequately for future jobs (Kuh, 2014). Higher education institutions are expected to assure stakeholders that students leave colleges and universities with the skills they need to be productive workers and citizens. However, employers state there is "...a gap between how higher education prepares students for the workforce and how companies want individuals trained to be productive and valuable employees" (Myers, 2015, p. 60). According to the report by the Manpower Group (2015), when employers are asked why they have difficulty filling jobs, more than one in five hiring managers (22%) indicated that lack of experience is behind the talent shortage and 17% state a lack of workplace competencies. Employers also stated that the most frequent soft skills deficits are lack of professionalism and lack of enthusiasm, motivation and learning mindset. Often, faculty and administrators at colleges and universities are asked to prove that students integrate knowledge and skills from across the curricula, apply those skill-sets in real-world environments and are prepared for the workforce.

One example of stakeholders' concerns about students' preparedness for the workplace is presented in the report by Hart Research Associates for The Association of American Colleges and Universities (2015) which states: 80% of the employers responding to their study indicated that it is very important for graduates to demonstrate their ability to apply learning in real-world settings; only 23% of the employers think graduates are very well prepared to apply knowledge and skills in real-world settings. According to report by RAND (2004), shortages of candidates who are qualified for employment exist in many sectors of the economy and are expected to increase in the future as baby boomers continue to retire.

Another stakeholder in graduates' education and preparation for the workplace are the parents who are providing financial support to young adults enrolled in school as compared to those not enrolled in school. According to the *Better Money Habits Millennial Report* (Bank of America & USA Today, 2015), their November 2014 survey of 1,000 millennials and 1,005 parents of millennial children revealed that 31% of the young adults who were students reported that they received "regular financial help" from their parents compared to 12% of the young adults who are not attending school. Sixty five percent of millennials also reported "receiving a lot or some financial assistance from their parents when they were just starting out" (Bank of America & USA Today, 2015, p.8) compared to 36 percent of their parents who received similar assistance when they were young adults. With the money that parents are spending towards a young adult's education, parents are focusing on the importance of colleges having curriculum that will prepare students for jobs; this is occurring while their children are in middle school and high school (Jaschik, 2013). In a Gallup poll conducted for *Inside Higher Ed*, of 3,269 adults with children in the 5th through 12th grades, 38 percent of parents surveyed chose "to get a good job" as the top reason for their children to have a college education (Jaschik, 2013).

The Future

Students face a twenty-first century world of challenges in the workplace and they need preparation in college for the changes they will encounter. To prepare students to meet these challenges, they must have opportunities to learn, apply and integrate knowledge from across the curriculum and be prepared with the necessary skill sets for the workplace (Association of American Colleges & Universities, 2015). Working with employers to determine the skill sets needed in the workplace is essential for curriculum revision and provision of learning opportunities that better prepare our graduates with the skills, competencies, and knowledge for the competitive, global workplace.

DATA AND METHODOLOGY

Purpose of the Study

The purpose of the study was to address the following research questions: 1.) According to businesses representatives in New Jersey what knowledge, skills, and competencies are considered most valuable for successful performance in the workplace and 2.) Is there a difference in what knowledge, skills, and competencies are small and mid to large size businesses consider to be essential for successful performance in the workplace?

Development of the Survey

There were 21 skills and competencies selected to be evaluated by businesses as very important, important, limited importance, or not important. Fifteen of the skills had been previously evaluated by employers of Stockton University graduates and alumni of Stockton University in prior study by Holtzman and Kraft (2011). This study selected the skills that 80% of employers in the prior study rated as important or very important. The six new skills that were added to the survey were attitude/professionalism, work ethic, enthusiasm, knowledge of the profession, networking, and sales presentation experience. These skills were

identified based on feedback received from the prior study of qualitative comments from employers and alumni about the skills they desired in employees.

Data Collection

The data collection occurred in two phases. The first phase took place during May 2015. During the first phase the researchers formed a list of businesses to contact through the *NJ Biz Book of Lists*. NJ Biz is a leading New Jersey business journal that covers news and events in the state of New Jersey on its web site and through a print edition with over 15,000 copies circulated each week (NJBiz.com, 2016). The researchers chose businesses in industries that would potentially hire college graduates. With the support of the William J. Hughes Center for Public Policy and Stockton Polling Institute the surveys were e-mailed to the businesses. There were 124 completed surveys of which 120 surveys came from businesses with less than 1,000 employees. The four surveys that came from businesses with over 1,000 employees were removed from the sample as the researchers wanted all the surveys from the NJ Biz list to be from employers with less than 1,000 employees.

To balance data to represent both small and mid to large size business the researchers hired Research America, a professional data research company, to collect data from hiring managers from mid to large size businesses having over 1000 employees during August 2015. The final sample consisted of 120 samples from the NJ Biz book of lists and 71 samples from Research America. The number of samples collected from Research America was limited by a budget. Table 1 lists the number of employees, frequency, and percent of the businesses in the study sample. The respondents from the businesses with under 1,000 employees were contacted through the *NJ Biz* list. The respondents with businesses have 1,000 or more employees were contacted by Research America. Seventy percent of the businesses in the study had less than 50 employees (47%) or 4,000 or more employees (23%).

Table 1: Size of Businesses Surveyed

Number of Employees	Frequency	Percent
0-49	90	47%
50-99	13	7%
100-499	14	7%
500-999	3	2%
1000-1999	16	8%
2000-2999	6	3%
3000-3999	5	3%
4000 or more	44	23%
Total	191	

Table 1 lists the number of employees, frequency, and percent of the businesses in the study sample. The respondents from the businesses with under 1,000 employees were contacted through the NJ Biz Book of lists. The respondents with businesses having 1,000 or more employees were contacted by Research America.

RESULTS AND DISCUSSION

Research Question 1: According to Businesses Representatives in New Jersey What Knowledge, Skills, and Competencies Are Considered Most Valuable for Successful Performance in the Workplace?

To answer research question number one the researchers ranked the top three skills rated by the employers as very important or important. Table 2 lists the skills in the first column rated as very important or important sorted in descending order. The percentage of employers reporting the skill as important or very important is listed in the second column. The sample size for each skill is listed in the parenthesis next to the percentage rating the skill as important or very important. The top three skills that were identified as important or very important for the total sample of 191 employers were: 1.) written communication skills

(94%) and adapting to change and being flexible (94%), 2.) enthusiasm (92%), and 3.) team work skills, thinking creatively to solve problems, interpersonal skills, and work ethic (91%).

The skills in fourth place were knowledge of profession, thinking critically/analytically, respecting and valuing diversity, and locating, organizing and evaluating relevant information. Hence, half of the skills surveyed were rated as important or very important by 90% of the employers surveyed. Seven other skills – ethical understanding (89%), attitude/ professionalism (89%), managing time (89%) speaking/oral communication skills (89%), working independently (88%), quantitative reasoning skills (87%), and leadership/ motivation skills (86%) were rated as important or very important by 86-89% of the employers surveyed. The majority of the skills surveyed were rated as very important or important by over 85% of the employers surveyed. Knowledge of global issues/international policies and sales presentation experience were rated lower than the other skills with 74% and 72% of the employers considering them to be important or very important.

Table 2: Percent of New Jersey Businesses Reporting a Skill as Important or Very Important

Skill	Percent of Businesses Reporting Skill as Very Important or Important (Total Number of Responses)
Written Communication Skills	94% (187)
Adapting to Change and Being Flexible	94% (184)
Enthusiasm	92% (190)
Teamwork Skills	91% (188)
Thinking Creatively to Solve Problems	91% (188)
Interpersonal Skills	91% (187)
Work Ethic	91% (187)
Knowledge of Profession	90% (184)
Thinking Critically/Analytically	90% (169)
Respecting and Valuing Diversity Issues	90% (184)
Locating, Organizing, Evaluating Relevant Information	90% (185)
Ethical Understanding	89% (185)
Attitude/Professionalism	89% (189)
Managing Time	89% (188)
Speaking/Oral Communication Skills	89% (183)
Working Independently	88% (189)
Quantitative Reasoning Skills	87% (187)
Leadership/Motivation Skills	86% (185)
Networking	83% (187)
Knowledge of Global Issues/International Policy	74% (187)
Sales Presentation Experience	72% (180)

Table 2 lists the skill in the first column. The percentage of employers reporting the skill as important or very important is listed in the second column. The sample size for the skill is in parentheses.

Research Question 2: is There a Difference in What Knowledge, Skills, and Competencies that Small and Mid to Large Size Businesses Representatives Consider to be Essential for Successful Performance in the Workplace?

The top 3 skills for large businesses were: 1.) attitude/professionalism (100%), 2.) work ethic, adapting to change/being flexible, respecting and valuing diversity (tied at 99%) and 3.) ethical understanding, enthusiasm, interpersonal skills, teamwork skills (tied at 97%). The top three skills identified for small businesses were: 1.) written communication skills (92%), 2.) sales presentation experience and adapting to change and being flexible (91%), and 3.) networking and enthusiasm (90%).

Table 3: Comparison of Ranking of Skills Rated as Very Important or Important for Small and Mid to Large Size Businesses

Skill (Large Business)		Skill (Small Business)	
Attitude/Professionalism	100% (70)	Written Communication Skills	92% (119)
Work Ethic	99% (70)	Sales Presentation Experience	91% (115)
Adapting to Change and Being Flexible	99% (69)	Adapting to Change and Being Flexible	91% (117)
Respecting and Valuing Diversity Issues	99% (70)	Networking	90% (116)
Ethical Understanding	97% (70)	Enthusiasm	90% (115)
Enthusiasm	97% (69)	Knowledge of Profession	89% (114)
Interpersonal Skills	97% (70)	Quantitative Reasoning Skills	88% (119)
Teamwork Skills	97% (69)	Teamwork Skills	88% (119)
Locating, Organizing, Evaluating Relevant Information	96% (68)	Thinking Creatively to Solve Problems	88% (119)
Written Communication Skills	96% (69)	Thinking Critically/Analytically	87% (119)
Thinking Creatively to Solve Problems	96% (69)	Interpersonal Skills	87% (118)
Managing Time	94% (68)	Work Ethic	86% (117)
Thinking Critically/Analytically	94% (70)	Working Independently	86% (115)
Speaking/Oral Communication Skills	94% (71)	Leadership/Motivation Skills	86% (115)
Knowledge of Profession	91% (71)	Locating, Organizing, Evaluating Relevant Information	86% (115)
Working Independently	90% (69)	Managing Time	86% (120)
Leadership/Motivation Skills	87% (70)	Speaking/Oral Communication Skills	85% (117)
Quantitative Reasoning Skills	84% (68)	Ethical Understanding	85% (119)
Networking	71% (69)	Knowledge of Global Issues/International Policy	85% (118)
Knowledge of Global Issues/International Policy	54% (67)	Respecting and Valuing Diversity Issues	85% (117)
Sales Presentation Experience	38% (63)	Attitude/Professionalism	83% (115)

The first column lists the skills that employees from mid to large sized businesses rated as important or very important sorted in descending order. The second column lists the percentage of employers from large businesses rating the skill as important or very important. The sample size for the skill is in parentheses. The third column lists the skills that employees from small businesses rated as important or very important sorted in descending order. The fourth column lists the percentage of employers from small businesses rating the skill as important or very important. The sample size for the skill is in parentheses.

The skills of mid to large size businesses and small businesses were compared to determine if there were statistically significant differences in the percentage of respondents who rated them as important or very important. Table 4 lists the 21 skills and the percentage of mid to large size businesses and small businesses that reported that the skill was very important or important for the workplace sorted in descending order on the percentage of respondents from mid to large size business column rating the skill as important or very important. The p-value is calculated by using the method for statistical inference for the difference of two sample proportions with different sample sizes. The p-value is reported in the third column of Table 4. The last column of table 4 tells whether the difference is significant.

There were a significantly greater percentage of respondents from mid to large size businesses rating the following skills as important or very important –attitude/professionalism (p<0.01); work ethic (p<0.01); adapting to change/flexibility (p<0.05); respecting and valuing diversity (p<0.01); ethical understanding(p<0.01); enthusiasm (p<0.10); interpersonal skills (p<0.05); teamwork (p<0.05) locating, organizing, and evaluating relevant information (p<0.05); thinking creatively to solve problems (p<0.10); managing time (p<0.10); and speaking/oral communication skills (p<0.10). There were a significantly greater percentage of respondents from small businesses rating networking (p<0.01), knowledge of global issues/international policy (p<0.01), and sales experience as important (p<0.01) or very important than respondents from mid to large size businesses.

Table 4: Skills Rated as Very Important or Important for the Workplace by Mid to Large Sized Businesses and Small Businesses

Skill	Percent Mid to Large Businesses (Total Number of Responses)	Percent Small Businesses (Total Number of Response)	P-Value
Attitude/Professionalism	100% (70)	83% (115)	0.000***
Work Ethic	99% (70)	86% (117)	0.005***
Adapting to Change and Being Flexible	99% (69)	91% (119)	0.033**
Respecting and Valuing Diversity Issues	99% (70)	85% (119)	0.003***
Ethical Understanding	97% (70)	85% (115)	0.008***
Enthusiasm	97% (69)	90% (117)	0.059*
Interpersonal Skills	97% (70)	87% (118)	0.023**
Teamwork Skills	97% (69)	87% (120)	0.036**
Locating, Organizing, Evaluating Relevant Information	96% (68)	86% (117)	0.030**
Written Communication Skills	96% (69)	92% (119)	0.372
Thinking Creatively to Solve Problems	96% (69)	88% (119)	0.087*
Managing Time	94% (68)	86% (117)	0.078*
Thinking Critically/Analytically	94% (70)	87% (119)	0.136
Speaking/Oral Communication Skills	94% (71)	85% (115)	0.074*
Knowledge of Profession	91% (71)	89% (120)	0.686
Working Independently	90% (69)	86% (114)	0.415
Leadership/Motivation Skills	87% (70)	86% (115)	0.839
Quantitative Reasoning Skills	84% (68)	88% (119)	0.394
Networking	71% (69)	90% (116)	0.000***
Knowledge of Global Issues/International Policy	54% (67)	85% (118)	0.000***
Sales Presentation Experience	38% (63)	91% (115)	0.000***

Table 4 lists the 21 skills and the percentage of mid to large size businesses and small businesses that reported that the skill was very important or important for the workplace sorted in descending order on the percent mid to large size business column. The total number of responses for each skill is in parenthesis. The p-value is calculated by using the method for statistical inference for the difference of two sample proportions with different sample sizes. The p-value is reported in the last column of Table 4. ***, **, and * indicate significance at the 1, 5, and 10 percent levels respectively.

Analysis of Skills

This study demonstrates the value that businesses place on soft skills. The differences in the skills that small and large businesses value could be attributed to the differences in the skill sets required for an entrepreneur and the structured nature of a large business. Jobs in large businesses have defined job responsibilities (Ingram, 2016). Employees working at large businesses work in teams which requires them to have interpersonal skills and respect diversity. Large companies are more willing to take a risk (The Street, 2013) whereas smaller companies often are resistant to change which may explain why mid to large size businesses place a high value on adapting to change and being flexible.

Newlands (2014) identifies sales ability as the most important skills an entrepreneur must have. Selling is critical to keep customers coming back to the business. Entrepreneurs need to be effective communicators (Newlands, 2014) and be adept at public speaking (Root, 2016 a.). They need to be able to create sales pitches that will sell their product in order to stay in business (Root 2016 a.). Entrepreneurs need to be networking with the public to sustain their business. Hence it makes sense that small business owners would value networking as a skill. The Internet has given small businesses the ability to reach international customers for a low cost (Root, 2016 b.). With the Internet revolution, small businesses are now able to tap into international markets whereas in the past their marketplace was local. Having employees that understand global issues would be beneficial for small businesses as this may be a new market for them whereas large businesses are already established internationally.

CONCLUDING COMMENTS

The focus of this study was to answer the following questions: 1) according to businesses representatives in New Jersey what knowledge, skills, and competencies are considered most valuable for successful performance in the workplace and 2) is there a difference in what knowledge, skills, and competencies that small and mid to large size businesses consider to be essential for successful performance in the workplace? To answer these questions the researchers developed a survey with 21 skills and competencies to be evaluated by businesses as very important, important, limited importance, or not important. The researchers formed a list of businesses to contact through the *NJ Biz Book of Lists*. With the support of the William J. Hughes Center for Public Policy and Stockton Polling Institute the surveys were e-mailed to the businesses. There were 124 completed surveys of which 120 surveys came from businesses with less than 1,000 employees. To balance data to represent both small and mid to large size business the researchers hired Research America, a professional data research company, to collect data from hiring managers from mid to large size businesses having over 1000 employees during August 2015. The final sample consisted of 120 samples from the NJ Biz book of lists and 71 samples from Research America.

According to the 191 businesses representatives in our sample the top three skills that were identified as important or very important were: 1.) written communication skills (94%) and adapting to change and being flexible (94%), 2.) enthusiasm (92%), and 3.) team work skills, thinking creatively to solve problems, interpersonal skills, and work ethic (91%). The results of our study also revealed that there is a difference in what knowledge, skills, and competencies that small and mid to large size businesses consider to be essential for successful performance in the workplace. There were significantly greater percentages of respondents from mid to large size businesses that rated the following skills as important or very important –attitude/professionalism ($p<0.01$); work ethic ($p<0.01$); adapting to change/flexibility ($p<0.05$); respecting and valuing diversity ($p<0.01$); ethical understanding($p<0.01$); enthusiasm ($p<0.10$); interpersonal skills ($p<0.05$); teamwork ($p<0.05$) locating, organizing, and evaluating relevant information ($p<0.05$); thinking creatively to solve problems ($p<0.10$); managing time ($p<0.10$); and speaking/oral communication skills ($p<0.10$). There were a significantly greater percentage of respondents from small businesses rating networking ($p<0.01$), knowledge of global issues/international policy ($p<0.01$), and sales experience as important ($p<0.01$) or very important than respondents from mid to large size businesses. The differences in the skills that small and large businesses value could be attributed to the differences in the skill sets required for an entrepreneur and the structured nature of a large business.

This study demonstrates the importance of soft skills as skills that employers value for entry level jobs for college graduates. Soft skills are defined as “desirable qualities for certain forms of employment that do not depend on acquired knowledge: they include common sense, the ability to deal with people, and a positive flexible attitude” (*Soft Skills*, 2016). The value in soft skills is that they are necessary for success in any profession. Soft skills are critical for developing skills such as leadership, negotiation, mediation, mentoring and managing others (Robels, 2012). There is concern that both high school (Gewertz, 2007) and college graduates do not possess the soft skills needed to succeed in the workplace. A report by the U.S. Department of Labor states that colleges and universities are not teaching business graduates the interpersonal skills they need for the workplace (Mangan, 2007). A study of 400 corporate managers by Bronson (2007) revealed that 70% of high school students lacked work ethic and professionalism skills need to succeed in the workplace. These findings, along with this study, demonstrate a need for colleges and universities to be teaching soft skills in the curriculum. In order to effectively teach soft skills, colleges and universities need to identify the soft skills that they want to teach and the courses where they want to teach these skills. Once these skills are identified an outcomes based assessment instrument can be developed (Steadman & Guzik, 2016).

Faculty at colleges and universities need to focus writing requirements on business writing and having students write succinctly. It is recommended that business students be taught interviewing skills,

professionalism, and business etiquette in a separate course. Providing experiential learning experiences such as business etiquette dinner, video- taping mock interviews, or projects such as interviewing a manager would be beneficial in helping students practice their soft skills. Having speakers come to classes to discuss the importance of professionalism and soft skills would let students know the importance of these skills. Research suggests that practicing soft skills reduces the time to learn them (Wilhelm, 2004). Faculty can help students practice soft skills in classes by role playing and facilitating student interaction in class with group activities.

Limitations

There are several limitations of the study. The first is the survey itself. The skills may have been worded in a way for different interpretations. For example, professionalism could be interpreted as the way in which an employee dresses, speaks, or their appearance (Robles, 2012). Others may interpret professionalism as being on time or behaving in a businesslike manner. The researchers believe that the respondents interpreted the word networking to mean building business relationships with others, however, a respondent could interpret networking to mean computer networking. Some of the skills overlap such as managing time being interpreted as being on time which could be considered professionalism or the way in which one speaks being considered oral communication skills, interpersonal skills, or professionalism. Secondly, the survey is a convenience survey. The distribution of the businesses was also constrained by the businesses in New Jersey. For example, there were more government agencies and educational institutions represented in the large businesses category. The representation coming from the different industries may have influenced survey responses regarding skills and competencies needed in the workplace. The number of samples that could be collected was constrained by a budget and the willingness of people on the NJ Biz list to participate in the survey. The data was collected from two different sources- a list from *NJ Biz* and Research America. The respondents from Research America were screened by Research America to be respondents that had input for hiring decisions. The data collected by Research America may have been collected from respondents more knowledgeable about the skills needed for the workplace.

Directions for Future Research

This study focused on skills needed for the New Jersey workplace; given the interconnectedness of our economy and businesses throughout the world, conducting a study in a major region of the world would be a significant contribution to the skills and competencies needed for the workplace.

APPENDIX

This is the survey used to collect the data.

Q5-Q26. Place a check in the column that best represents your answer regarding the importance of the knowledge, skill or competency in your organization for an entry level job requiring a bachelor’s degree

<i>RANDOMIZED</i>	Very Important	Important	Limited Importance	Not Important	Not Applicable
Q5 Thinking Critically/analytically					
Q6 Speaking/Oral Communication					
Q7 Written communication					
Q8 Respecting and Valuing Diversity/Multicultural Issues					
Q9 Ethical Understanding					
Q10 Locating, organizing, evaluating Relevant Information					
Q11 Quantitative Reasoning: Ability to use mathematics or statistics					
Q12 Teamwork Skills					
Q13 Managing Time					
Q14 Thinking creatively to Solve Problems					
Q15 Working Independently					
Q16 Interpersonal Skills					
Q17 Adapting to change and Being Flexible					
Q18 Leadership/Motivation Skills					
Q19 Knowledge of Global Issues/International Perspective					
Q20 Enthusiasm					
Q21 Work Ethic					
Q22 Attitude/Professionalism					
Q23 Networking					
Q24 Sales Presentation Experience					
Q25 Knowledge of the field/profession					

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SUPPLY CHAIN COMPETENCY AND ITS EFFECT ON PERFORMANCE: A FUZZY-SET ANALYSIS

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ABSTRACT

With organizations concentrating on their core competencies, the role of suppliers and supply chain management has assumed greater importance. The objective of this study was to come up with a composite variable of supply chain competency (SCC) based on different constituent factors, namely, supplier involvement, length of supplier relationship, use of IT, and logistics integration and to analyze its relationship and that of the individual factors with a firm's supply chain performance (SCP). Survey data was collected from 187 organizations in Brazil, Korea and India. Fuzzy-set methodology was employed to determine causation i.e., whether SCC and other factors were necessary or sufficient cause for SCP. The findings indicate that SCC is both a necessary and sufficient cause for SCP which establishes its importance as an explanatory variable for SCP.

JEL: M11

KEYWORDS: Supply Chain Competency, Supply Chain Performance, Fuzzy-Set Analysis

INTRODUCTION

Increased competition in a globalized market place has resulted in most organizations focusing on their core competencies and outsourcing other activities to their suppliers and business partners, both upstream and downstream in the value chain (Prahalad and Hamel, 1990). Added reliance on suppliers has transformed competition between individual firms to competition between supply chains (Anderson and Katz, 1998). The source of competitive advantage is no more localized in the focal organization but is dispersed along the entire supply chain. This has led to a greater internationalization of sourcing, production and manufacturing activities, adding to the complexity of supply chains. Management of supply chains has thus become increasingly important as a potential source of competitive advantage and improved performance.

Critical to the concept of supply chain management (SCM) is the notion of collaboration and integration among business partners. Organizations are called upon to collaborate extensively so that the entire process across the supply chain can be managed as a unit where each member of the supply chain focuses on what it does best leaving the rest to others (Prahalad & Hamel, 1994). Though the extent of interaction is determined by the level of integration desired, management of supply chain processes necessitates multiple communications at different decision levels leading to lower inventories, reduction in cycle time, improved quality and better customer service (Davis, 1993). Furthermore, companies high on the integration level do not limit their collaboration to operational issues alone. They fully realize the benefit of outsourcing through increased involvement in joint product design and development, and other allied activities. The objective of this study was to determine the relationship of different constituent factors of supply chain to performance. Four factors, namely, supplier involvement, longer supplier relationship, better use of information and communications technology, and closer logistics integration were deemed as

critical to supply chain efficacy and have been used as influencing variables. Further, the study develops a holistic variable, Supply Chain Competency (SCC), based on these factors to capture the overall competency of the supply chain. Similarly, a variety of measures were used to determine the overall performance of the supply chain, called, Supply Chain Performance (SCP). The study was limited to manufacturers and suppliers i.e., it focuses on the upstream segment of the supply chain. Unlike most studies of this nature which have been conducted in developed countries, this study was carried out in three developing countries. A distinctive feature of the study uses is that it uses the Fuzzy-set methodology for analysis. This methodology has possibly never been employed for studies of this nature. In next section, the theoretical justification for the variables used in the study is discussed and hypotheses proposed. After that the research methodology and data collection is described. This is followed by analysis and discussion of results. Finally, conclusions are presented.

LITERATURE REVIEW OF SUPPLY CHAIN FACTORS

Improving service levels, reducing costs, and more efficiently responding to changes in customer demand are important supply chain goals. Based on literature survey, four factors, namely, supplier involvement (Ragatz, Handfield, and Scannell, 1997, Shin, Collier, and Wilson, 2000, Primo and Amundson, 2002), length of supplier relationship (De Toni and Nassimbeni, 1999, Dyer, 1997), use of information and communications technology (Radstaak and Ketelaar, 1998, Karoway, 1997), and logistics integration (Morash, Droge, and Vickery, 1997, Stock, 1990,) were identified as variables affecting SCP. Chen and Paulraj (2004) in their detailed analysis of supply chain management research have also included these factors as critical elements having a significant impact on SCP. The individual factors are discussed below.

Supplier Involvement (SI)

With companies outsourcing not only commoditized products but even fabrication and sub-assemblies, an ever increasing value of the end product value is being contributed by suppliers. Supplier involvement is hence critical to management of different supply chain processes. The recognition that inter-firm resources and relationships in which the firm is embedded can be a potential source of competitive advantage for all partners in a supply chain highlights the importance of increased supplier involvement (Hamel, 1991, Khanna, Gulati, and Nohria, 1998). Overall, a high degree of supplier involvement results in optimization of the resources and capabilities of the entire supply chain and has been found to be an important determinant of supply chain performance (Shin, Collier, and Wilson, 2000). Meaningful supplier involvement requires long-term commitment from the supplier and purchasing organizations and appropriate technological preparedness. Organizations profit by closer interaction with their suppliers for a variety of activities. Suppliers can learn about customer requirement and preferences leading to a better application of resources. Supplier involvement in activities such as product design, continuous improvement and other collaborative efforts positively affect performance (Vonderembse and Tracy, 1999, Clark, 1989, Lavie, 2006). Mechanisms and procedures facilitating early supplier involvement can lead to a reduction in design and manufacturing costs, and in the risks associated with supply disruption. Supplier involvement is especially beneficial to the product development process (Ansari and Modarress, 1994). Creation of cross-functional teams and participation of the focal organization and suppliers in the product development process can lead to higher product development productivity and a reduction in the time-to-market of new products (Shin, Collier, Wilson, 2000).

Length of Supplier Relationship (LSR)

With the increasing acceptance of core competency as an operating practice leading to vertical disintegration, firms must necessarily augment their supplier relationships. Strong supplier relationships helps better leveraging of resources and capabilities across the supply chain resulting in better satisfaction

of customer needs. Additionally, supplier relationships also facilitate logistics integration which is so crucial to overall supply chain performance (Paulraj and Chen, 2007). Given complex supply networks, collaboration among members of the supply chain undoubtedly poses a logistical challenge. However, the biggest impediment to collaboration arises from the lack of complete trust between participating organizations. The importance of trust and its lack thereof leading to opportunism is well established in the transaction theory of Williamson (1975). Existence of trust is necessary to transform transactional relationships to a collaborative ones and lay the foundation for successful alliances (Monczka *et al.*, 1998, Whipple and Frankel, 2000, Zhao and Cavusgil, 2006). While trust helps build relationships, length of the relationship in turns augments trust and the strength of the relationship is determined *inter alia* by the relationship's overall duration (Capaldo, 2007). Collaborative relationships are generally typified by long term relationships (Min *et al.*, 2005, Ogden, 2006). Long term relationships strengthen buyer-seller relationships (Stuart, 1993), enables a supplier to become an integral part of a supply chain which has a lasting effect on the competitiveness of an entire supply chain and leads to better supply chain performance (Shin, Collier, and Wilson, 2000).

Information Technology (IT)

To address the increasing complexity of supply networks, organizations use a variety of IT tools to further integration. IT enables sharing of information leading to higher visibility among supply chain members with attendant benefits of reduced inventory and supply disruptions. It can aid a host of activities and processes such as production planning, inventory management, order fulfillment, shipment status etc. Use of IT reduces transaction costs along the entire supply chain and helps eliminate the inefficiencies of a supply chain. It facilitates inter-organizational collaboration, improves flexibility and responsiveness (Swafford, Ghosh, and Murthy, 2008, Gunasekaran and Ngai, 2004), and leads to better overall supply chain management and performance (Kearns and Lederer, 2003, Vickery *et al.*, 2003, Stank, Keller, and Daugherty, 2001, Radstaak and Ketelaar, 1998, Karoway, 1997).

Logistics Integration (LI)

The term integration encompasses both internal and external. External integration i.e., the integration of processes across business partners of the supply chain is especially desired as most firms are moving away from an adversarial relationship to more of an alliance characterized by a long term relationship with a fewer number of suppliers (Ogden, 2006). A necessary pre-requisite for such integration is for the focal organization to view suppliers as strategic partners who can add value and be a source of competitive advantage (Langley and Holcomb, 1992, Chen and Paulraj, 2004).

Within the overall ambit of integration, logistics integration specifically, calls for increased sharing of logistics related information leading to better coordination of all logistics activities among the focal organization, suppliers and customers (Stock, Greis, and Kasarda, 2000). It is premised on the belief that the value proposition to the customer is enhanced when the logistics activities are coordinated so that products and information can flow seamlessly through the entire supply chain. Logistics integration can eliminate waste from the supply chain, lead to smoother production processes (Frohlich and Westbrook, 2001), improve flexibility and responsiveness, and reduce cost of doing business (Nooteboom, 1992). It has been found to be among the most important of all supply chain factors in its impact on performance (Narasimhan and Kim, 2002, Tan, 2002).

Supply Chain Competency (SCC)

Important as they may be, individual variables of supply chain management, as discussed above, may not make an impact on supply chain performance. Supply chains are multi-dimensional in nature and hence improvements in supply chain performance are more likely to result from the combined effect of these

factors. The process view of organizations emphasizing horizontal processes cutting across organizational boundaries, which underpins the concept of supply chains, lends support to the notion of a holistic variable. A holistic variable, as a measure of supply chain competency, is really a characteristic of the integration of supply chain participants (Chen, Daugherty, and Landry, 2009, Fawcett, Magnan, and McCarter, 2008, Kim, 2006). For the purpose of this study, this holistic variable, SCC, represents the four different variables (SI, LSR, LI, IT) working in concert. A higher SCC value suggests higher efficiency of operations across the supply chain resulting from better collaboration and integration among supply chain members and would be a source of competitive advantage (Bowersox, Closs, and Stank, 2000, Christopher, 2011, Lambert and Cooper, 2000, Lee, 2004, Ketchen et al. 2008, Mentzer et al., 2001). SCC therefore, will have a positive impact on performance.

Various theoretical approaches lend support to the variables used in the study. Individual variables, such as IT for example, help lower transaction cost and hence find support from the transaction cost perspective (Coase, 1937, Williamson, 1975). The “relational view” of inter-organizational competitive advantage (Dyer and Singh, 1998) lends support to the importance of supplier relationship as factor impacting supply chain performance (Autry and Griffis, 2008, Cousins and Menguc, 2006, Staughton and Johnston, 2005). Similarly, an extended view of the resource-based view (Barney, 1991) provides theoretical foundation for the concept of supplier involvement. Supplier involvement augments the resources and capabilities of the focal organization and helps in the innovation process through external exchange (Capron, Dussauge, and Mitchell, 1998).

METHODOLOGY

Fuzzy-set Analysis (FSA) methodology was used in this study. The methodology was developed by Ragin (1987, 2000). The objective of FSA is to determine the relationship between the variable of interest (in our case, supply chain performance) and other variables. Specifically, it helps identify necessary and sufficient conditions for the outcome of interest i.e., SCP. The uniqueness of FSA stems from the fact that it combines both qualitative and quantitative aspects in a single methodology. Variables in fuzzy set analysis are conceptualized as qualitative states i.e., as sets with boundaries between membership and non-membership. A value of 1 represents complete membership while a value of 0 represents non-membership. These two scores reflect the two qualitative states of being *fully in* and *fully out*, also referred to as the “*crisp set*”. Variables however, may have intermediate scores between these two end values and this is what introduces the quantitative element in the methodology. The extent or degree of membership in the set is determined by the score. The scores between these end points inject the quantitative element in the methodology. Individual instances in fuzzy-set analysis vary in the degree of their membership in these states. It is this concept of partial membership which distinguishes it from the crisp set. A score of 0.5 suggests half membership i.e., the case is neither in nor out. A score higher than 0.5 indicate that case is more in than out, while a score below 0.5 indicates that case is more out than in (Ragin, 2000). FSA employs the subset principle to determine causation.

For a variable to be considered a necessary cause, the fuzzy-set scores of the causal variables (X_i) must be equal to or greater than fuzzy-set score of the outcome variable (Y_i) i.e., the outcome is a subset of the causal factor ($Y_i \leq X_i$). Inference of sufficient causation on the other hand requires that the fuzzy-set scores of the causal variables be less than or equal to the score of the outcome variable i.e., the causal factor is a subset of the outcome ($X_i \leq Y_i$). To enhance the utility of the technique since strictly necessary and sufficient conditions may not be realized in actual conditions, Ragin (2000) has proposed the concept of “quasi-necessity” and “quasi-sufficiency” through the use of adjustment factors. Using an adjustment factor of 0.17 implies that the necessary causation condition would be satisfied if $Y_i - 0.17 \leq X_i$ and a sufficiency causation would be satisfied if $X_i - 0.17 \leq Y_i$. Furthermore, since even a single inconsistent data point will invalidate the inference of necessary or sufficient causation, researchers have often used benchmark proportions (Pennings, 2003). A benchmark refers to the proportion of the cases

that are consistent with the causal argument being tested. A factor is considered “almost always” necessary (or sufficient) if 80 % or more of the cases exhibit the causal relationship and “usually” necessary (or sufficient) if 65 % or more of cases are consistent with the causal argument (Ragin, 2000).

HYPOTHESES

Based on the above discussion of supply chain factors and the methodology employed in the study, the following hypotheses are proposed.

Hypothesis 1: SCC is an “almost always” necessary cause for SCP

Hypothesis 2: SCC is an “almost always” sufficient cause for SCP

Hypothesis 3: SI is a necessary cause for SCP

Hypothesis 4: LSR is a necessary cause for SCP

Hypothesis 5: IT is a necessary cause for SCP

Hypothesis 6: LI is a necessary cause for SCP

It is important to note that SCC, a composite variable which captures the aggregate effect of the individual factors, is hypothesized as both a necessary and sufficient cause for SCP. Individual variables on the other hand are only expected to be necessary but not sufficient causes for SCP. Each variable by itself is a necessary pre-requisite for SCP but on its own cannot ensure SCP. Only in conjunction with other variables will it be result in SCP. Further, since the primary variable of interest of the study is SCC, hypotheses relating to SCC are being tested for “almost always” validity i.e., they will be tested at the test proportion of 0.80.

DATA COLLECTION

Sampling and Data Collection

The survey was done in three countries, Brazil, Korea, and India. The survey in Brazil was done in 2010 while that in Korea and India were done in summer and fall of 2011. A total of 60 personal interviews were conducted in 4 states of Brazil. The survey in India was essentially restricted to the eastern part of India. Out of a total of 220 companies who were contacted, 60 agreed to fill up the questionnaire in personal interviews. For the survey in Korea, the survey instrument was first translated in Korean and then mailed to 80 firms. A total 67 completed questionnaires were received. No obvious pattern was observed relating to the 13 non-respondents. Since the entire process of mailing and receiving the questionnaire was completed within two months it suggests little, if any, early response bias.

A wide spectrum of industries was represented in the survey. Major sectors represented in the survey were automotive (17%), consumer durables (16%), electrical equipment (19%) and chemical (16%). Table 1 gives the industry wise composition of surveyed organizations. Firms of different sizes were represented in the sample and the respondents were senior managers in the logistics/supply chain management department of the organizations who had spent considerable time in their companies and had adequate knowledge of its operations.

Items and Scales

A structured questionnaire employing 7-point Likert-type scale was used to collect data. Most of the items were adapted from earlier studies ensuring content validity (Chen and Paulraj, 2004, Bhatnagar and Sohal, 2005). Multi-item scales for different supply chain factors were developed and pretested prior to finalization of the survey instrument. While a host of measures have been employed to determine SCP (Christopher, 1998, Stewart, 1995, Mapes, New and Szwejczewski, 1997, Davis, 1993, Van Hoek, 2001),

literature suggests that there is a lot of commonality in the measures used. Measures used to study SCP for this research were restricted to operational measures alone such as quality, delivery and flexibility (Vickery, DrÖge and Markland, 1993, Miller and Roth, 1994). Specifically, SCP was measured by flexibility (volume and scheduling flexibility), on-time delivery, delivery reliability, quality standards, order lead time and order fill rate.

Table 1: Industry Wise Composition of Surveyed Companies

	Brazil	Korea	India	Total
Automobiles/Components	20	8	3	31
Fast moving consumer goods	7	5	8	20
Consumer Durables	22	7	0	29
Electrical equipment/machinery	9	25	2	36
Engineering goods	0	1	5	6
Chemicals/Pharmaceuticals	2	12	16	30
Other	0	9	26	35
Total	60	67	60	187

This table shows the composition of surveyed companies.

Analysis and Discussion of Results

Responses for survey items for the different supply chain factors, namely, LSR, LI, SI and IT, were tested for convergent reliability and discriminant validity using PLS software. Cronbach's alpha value of 0.7 is considered acceptable for convergent reliability. All values were above 0.8 suggesting good reliability for the individual constructs of the supply chain factors. SCP is viewed as a formative construct and hence the test for convergent reliability does not apply (Diamantopoulos and Winklhofer, 2001). Discriminant validity indicates the extent to which items of a construct differ or discriminate from items of another construct. The results of discriminant validity test clearly indicated that the constructs share a larger variance with their own indicators than with another construct. Discriminant validity is thus clearly established. Once again the issue of discriminant validity for SCP is inapplicable because of the formative nature of SCP construct. To come up with a single measure of SCP a principal component analysis (PCA) was conducted. SCP was computed by doing a PCA on the different performance variables (volume flexibility, scheduling flexibility, on-time delivery, quality standards, order lead time and order fill rate). A single factor based on the Eigen value criterion was retained.

This single measure captured most of the variation and hence was reflective of the overall performance. Similarly, to compute SCC, a PCA was performed on its constituent variables, namely, LSR, LI, SI and IT which resulted in a single factor being retained. Based on the individual values for variables, SCC and SCP for each respondent, fuzzy-set scores were assigned to each value using a seven-value fuzzy-set (1, 0.83, 0.67, 0.5, 0.33, 0.17 and 0). A seven value fuzzy set has been used by many authors as it permits a "relatively fine-grained distinction between cases" (Katz, Hau, and Mahoney, 2005). Fuzzy-set data was then analyzed to determine necessary or sufficient causation between SCC, the primary variable of interest, and SCP. The relationship of the constituent variables of SCC, namely, LSR, LI, SI and IT with SCP was also examined. As noted earlier, the use of adjustment factor of 0.17 has been recommended by Ragin (2000) since absolutely necessary or sufficient causes are seldom realized. An adjustment factor was employed in cases, if required.

Inference of a necessary or sufficient cause is best made using a test proportion of 0.80. A test proportion of 0.80 indicates that the factor is "almost always" necessary or "almost always" sufficient for the outcome. According to literature however, a test proportion 0.65 which suggests that the factor is "usually" necessary or "usually" sufficient for the outcome can also be considered. Clearly, a test proportion of 0.65 indicates a weaker causation than 0.80. In this study, analysis was done for both proportions and the results are discussed below.

Analysis of Necessary Causes

Table 2 presents the results of the analysis of necessary causes. The results clearly support the hypotheses. The table indicates, for example, that in 97 % of the cases the fuzzy score of LI was greater than the fuzzy score of SCP. When tested for significance at 0.8 this proportion was found to be significant at 0.01 level which leads to the conclusion that LI is almost always necessary for SCP. Similarly, in 82 % of the cases the adjusted value of SI (using an adjustment factor of 0.17) was more than SCP. This proportion was found to be significant when tested at test proportion of 0.65 which leads to the conclusion that SI is usually necessary for SCP. To sum up the results, as hypothesized, SCC is almost always necessary for membership in SCP. Of the constituent factors of SCC, while LI and LSR are almost always necessary, SI and IT are usually necessary for the outcome to happen. Thus, all the factors individually are either almost always or usually necessary for SCP. In other words, in the absence of these factors it is unlikely that an organization would be able to excel at SCP.

Table 2: Necessary Causes (Combined Dataset of All Countries)

Causal Factor	Proportion of Cases: Cause \geq SCP	
	Almost Always Necessary (Tested at proportion of 0.8)	Usually Necessary (Tested at proportion of 0.65)
SCC	0.90*** (adj. ¹)	
Logistics Integration	0.97***	
Supplier Involvement		0.82*** (adj. ¹)
Length of Supplier Relationship	0.89***	
Use of IT		0.75***

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used. Figures in the table indicate the proportion of cases where the causal factor value was equal or greater than the SCP value

Next necessary analysis for individual countries was performed. These are reported in Tables 3 through 5. In the case of Brazil (Table 3), the adjusted value of SCC was found to be greater than SCP in 88 % of the cases and this proportion turned out to be significant when tested at a proportion of 0.8. This leads to the inference that SCC is almost always necessary for SCP. The individual variables, except for SI, turn out to be almost always necessary. SI turned out to be usually necessary. The results for Brazil were very similar to those for the combined dataset.

Table 3: Necessary Causes (Brazil)

Causal Factor	Proportion of Cases: Cause \geq SCP	
	Almost Always Necessary (Tested at proportion of 0.8)	Usually Necessary (Tested at proportion of 0.65)
SCC	0.88* (adj. ¹)	
Logistics Integration	1***	
Supplier Involvement		0.75*
Length of Supplier Relationship	0.90***	
Use of IT	0.98***	

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used. Figures in the table indicate the proportion of cases where the causal factor value was equal or greater than the SCP value.

Table 4 presents the results for India. It shows, for example, that in 93 % of the cases the adjusted value of SCC was greater than SCP. This turned out to be significant at 0.01 level when tested at the almost always necessary proportion of 0.8. Similarly, LI turned out to be almost always necessary, while LSR and IT were found to be usually necessary. However, SI did not turn out to be necessary either at the 0.8 or 0.65 levels.

Table 4: Necessary Causes (India)

Causal Factor	Proportion of Cases: Cause ≥ SCP	
	Almost Always Necessary (Tested at proportion of 0.8)	Usually Necessary (Tested at proportion of 0.65)
SCC	0.93***(adj. ¹)	
Logistics Integration	0.98***	
Supplier Involvement		0.71 (adj. ¹)
Length of Supplier Relationship		0.85***
Use of IT		0.85***(adj. ¹)

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used. Figures in the table indicate the proportion of cases where the causal factor value was equal or greater than the SCP value.

Results of the necessary analysis on the Korean organizations are shown in Table 5. It shows that in 89 % of the cases the adjusted value of SCC is greater than SCP and this turned out to be significant at the test proportion of 0.8 i.e., it is almost always necessary. Similarly, LI and LSR turned to almost always necessary while SI and IT were found to be usually necessary.

Table 5: Necessary Causes (Korea)

Causal Factor	Proportion of Cases: Cause ≥ SCP	
	Almost Always Necessary (Tested at proportion of 0.8)	Usually Necessary (Tested at proportion of 0.65)
SCC	0.89**(adj. ¹)	
Logistics Integration	0.94***	
Supplier Involvement		0.79***
Length of Supplier Relationship	0.94***	
Use of IT		0.80***

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used. Figures in the table indicate the proportion of cases where the causal factor value was equal or greater than the SCP value

To sum up, the results on the combined dataset were largely replicated in the case of the three individual countries i.e., all the variables were found to be almost always or usually necessary except for SI in the case of India.

Analysis of Sufficient Causes

Table 6 presents the results of the analysis of sufficient causes. 93 % of the adjusted SCC values were less than the SCP values and this turned out to be significant at the test proportion of 0.8. Thus, as hypothesized, SCC is almost always sufficient for SCP. In other words, SCC essentially guarantees SCP. However, only 61 % and 69 % of the adjusted values of LI and LSR respectively were less than SCP and when tested at the test proportion of 0.65, these turned out to be not significant. SI was found to be almost always sufficient while IT was usually sufficient. It is clear that while SCC by itself is sufficient to ensure SCP, the same is not true of all its constituent variables. This is fully consistent with the underlying logic of SCC as a measure of the overall competency of the supply chain. Individual variables, important as they may be, represent only a particular dimension of supply chain functioning and do not therefore, ensure overall performance.

Table 6: Sufficient Causes (Combined Dataset of All Countries)

Causal Factor	Proportion of Cases: Cause \leq SCP	
	Almost Always Sufficient (Tested at proportion of 0.8)	Usually Sufficient (Tested at proportion of 0.65)
SCC	0.93*** (adj. ¹)	
Logistics Integration		0.61(adj. ¹)
Supplier Involvement	0.88*** (adj. ¹)	
Length of Supplier Relationship		0.69 (adj. ¹)
Use of IT		0.74*** (adj. ¹)

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used.

Figures in the table indicate the proportion of cases where the causal factor value was less than or equal to the SCP value

Next, separate analysis for each country was carried out (Tables 7 through 9). SCC which was almost always sufficient in the combined dataset again turns out to be almost always sufficient in case of each country which testifies to the robustness of the result. In the case of Brazil (Table 7), 91 % of the SCC values were less than SCP while the values for India (Table 8) and Korea (Table 9) were 90 % and 97 % respectively. When tested for significance these values turned out to be significant leading to the inference of SCC being almost always sufficient. Besides SCC though, in the case of Brazil (Table 7), only SI turned out to be significant at the 0.65 level. LI, LSR and IT failed the sufficiency test.

Table 7: Sufficient Causes (Brazil)

Causal Factor	Proportion of Cases: Cause \leq SCP	
	Almost Always Sufficient (Tested at proportion of 0.8)	Usually Sufficient (Tested at proportion of 0.65)
SCC	0.91**(adj. ¹)	
Logistics Integration		0.56 (adj. ¹)
Supplier Involvement		0.75* (adj. ¹)
Length of Supplier Relationship		0.60 (adj. ¹)
Use of IT		0.60 (adj. ¹)

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used. Figures in the table indicate the proportion of cases where the causal factor value was less than or equal to the SCP value.

Table 8 shows the results of the analysis for India. With the exception of LI, all the other variables, namely, SI, LSR and IT were significant when tested at the test proportion of 0.65. They are hence termed as usually sufficient. With respect to LI, however, only 61 % of the values were less than that of SCP which was not enough to meet the sufficiency condition.

Table 8: Sufficient Causes (India)

Causal Factor	Proportion of Cases: Cause \leq SCP	
	Almost Always Sufficient (Tested at proportion of 0.8)	Usually Sufficient (Tested at proportion of 0.65)
SCC	0.90**(adj. ¹)	
Logistics Integration		0.61 (adj. ¹)
Supplier Involvement		0.85***
Length of Supplier Relationship		0.80*** (adj. ¹)
Use of IT		0.86***

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used. Figures in the table indicate the proportion of cases where the causal factor value was less than or equal to the SCP value.

Table 9 shows the results for Korea. In addition to SCC, SI turned out to be almost always sufficient cause (91 % of cases had values less than SCP). Among the other constituent variables, LSR and IT turned out to be usually sufficient while LI did not turn out to be significant either at 0.8 or 0.65 test proportion. To summarize, the analysis of the individual countries reveals that, as in the combined dataset, while SCC is almost always sufficient for SCP, individual variables on their own are generally not sufficient for SCP.

Table 9: Sufficient Causes (Korea)

Causal Factor	Proportion of Cases: Cause ≤ SCP	
	Almost always Sufficient (Tested at proportion of 0.8)	Usually Sufficient (Tested at proportion of 0.65)
SCC	0.97*** (adj. ¹)	
Logistics Integration		0.64 (adj. ¹)
Supplier Involvement	0.91** (adj. ¹)	
Length of Supplier Relationship		0.76** (adj. ¹)
Use of IT		0.77** (adj. ¹)

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$; 1: an adjustment factor of 0.17 was used. Figures in the table indicate the proportion of cases where the causal factor value was less than or equal to the SCP value.

CONCLUSION & IMPLICATIONS

The primary motivation of the study was to analyze the relationship between the factors of supply chain with performance. This is especially relevant in an age where outsourcing is commonplace and success of organizations is often determined by success in managing supply chains. Data for the study was collected through a structured survey instrument from 187 respondents in three countries, namely, Brazil, India and Korea. Single measures of overall supply chain competency and performance were developed by employing PCA on their constituent factors. Fuzzy-set methodology was then employed to analyze the data and determine the existence of necessary or sufficient causation between SCC and SCP. The strength and appropriateness of the fuzzy-set approach to this study lies in the fact that it combines qualitative and quantitative aspects in its analysis. Variables are viewed as qualitative states and are assigned values between 0 and 1. Unlike regression, FSA does not treat all variation as relevant which makes the methodology suitable for analyses such as this. Using FSA, when a variable is determined to be a necessary cause, it implies that outcome will never occur in the absence of the cause. To put it differently, whenever the outcome is present, the cause will also be present; the cause therefore, is viewed as a *sine qua non* for the outcome. Determination of a sufficient cause on the other hand suggests that whenever the causal factor is present, the outcome will also be present.

Analysis on the combined dataset suggests the SCC is an almost necessary cause for SCP (hypothesis 1). For an organization to perform well it must possess adequate SCC. Further, since all the individual factors also turned out be necessary causes, hypotheses 3 through 6 are met. It suggests that individual factors are also essential for SCP. The findings were largely, though not completely, replicated in the case of individual countries. This testifies to the robustness of the results for it suggests that the findings are valid across different countries and organizational and cultural environments. Analysis of sufficiency analysis on the combined dataset reveals that SCC is an almost sufficient cause for SCP (hypothesis 2). The presence of SCC thus ensures SCP. The dual determination of SCC both as a necessary and sufficient cause suggests that while SCC is necessary for SCP, its presence also guarantees SCP. The importance of SCC as an explanatory causal variable of SCP is thus fully established. Interestingly, two of the individual variables failed to meet the sufficiency condition. This suggests that more than the individual constituent variables of SCC, what is crucial for SCP is the overall competency of the supply chain i.e., SCC. The results provide empirical support to the notion of SCC and for its utility as an explanatory variable for SCP. An organization lacking in a particular dimension of supply chain competency may make up for its deficiency by scoring high on another dimension. It is the overall supply chain competency of the firm that guarantees performance.

The findings of sufficiency analysis on the combined dataset were largely replicated in the case of India and Korea but were somewhat different in the case of Brazil. This may possibly be because of the relatively small sample sizes and the significant differences in the industrial profile of the respondents of each country. The study’s findings bring out the multi-dimensional nature of supply chain and the utility of using a composite variable, SCC, to measure its overall competency. More than any single factor, it is

the combined effect of all the factors that result in improved performance. The implications for managers are clear - they need to strengthen all the factors to achieve operational excellence. Supply chain performance is guaranteed for organizations which achieve overall supply chain competency. The study has some limitations. A sample size of 187 was used in the study. Future researchers may add to the validity of the findings by using a larger sample size and covering more countries. Further, respondents in the study were limited to manufacturers. Including suppliers and other supply chain members in a study will strengthen the findings. It may also reveal differences, if any, based on the role the organization in the supply chain.

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HOW DOES THE STADIUM ATMOSPHERE AT A COLLEGE FOOTBALL GAME AFFECT BEHAVIORAL INTENTIONS ACROSS GENDER LINES? THE MEDIATING ROLE OF SPECTATOR SATISFACTION

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ABSTRACT

This study, grounded in the Stimulus-Organism-Response (S-O-R) framework, examines the mediating role of spectator satisfaction in the relationship between sports stadium atmosphere (SSA) and spectators' behavioral intentions in the context of American college football. It also investigates if gender differences are evident in the hypothesized pathways. Survey data collected from 211 spectators during a 2014 college football game were analyzed using structural equation modeling procedure. Supporting the S-O-R model, the direct association between SSA and behavioral intentions was not significant but the effect of SSA on word-of-mouth was fully mediated by spectator satisfaction in both males and females. However, satisfaction mediated the effects of SSA on intent to recommend and intent to attend for females but not males. We discuss managerial and theoretical implications for sports managers.

JEL: Y8, Z2

KEYWORDS: Sports Stadium Atmosphere, Spectator Satisfaction, Behavioral Intentions, Sports Marketing, Stimulus Organism Response Theory

INTRODUCTION

Sports stadium atmosphere (SSA) refers to the unique environment in stadiums and arenas during sports events, including the physical traits of the venue as well as the actions of all the people associated with the event including fans and stadium personnel (Uhrich and Koenigstorfer, 2009; Uhrich and Benkenstein, 2010; Chen, Lin, and Chu, 2013). Sports stadium atmosphere can consist of stimuli that are created by organizers, by spectators, and by the game itself (Koenigstorfer, Groeppel-Klein, and Kunkel, 2010). The physical traits of a sports stadium that influence the atmosphere include the scoreboard, the layout of the seating (e.g., are fans close to or far away from the action), and the sound and lighting system (Hightower, Brady, and Baker, 2002; Wakefield, Blodgett, and Sloan, 1996).

For some time, academics have investigated the various elements that create the atmosphere at a sports stadium. Research first focused on the physical aspects of the built environment (e.g., scoreboard, lighting system, sound system, and architecture of the stadium) (Wakefield et al., 1996; Hightower et al., 2002). Kahle, Aiken, Dalakas, and Duncan (2003) expanded the study of stadium atmosphere to include the actions created by personnel at the stadium. Later, the concept of stadium atmosphere was modified to include the spontaneous actions of spectators inside the stadium related to what was happening during the game. The organizers and managers of sports events can influence crowd behavior when they put messages on the scoreboard or make announcements over the public address system urging spectators to cheer; at another

level, spectators exhibit crowd behavior and create their own atmosphere when they cheer a great play or boo an opponent (Uhrich and Benkenstein, 2012; Yoshida and James, 2010; Charleston, 2008); fanatical supporters' groups can urge on other fans to cheer and sing chants (Theysohn, Hinz, Nosworthy, and Kirchner, 2009). Only recently have researchers advanced a comprehensive measure of sport stadium atmosphere that encompasses several factors associated with stadium atmosphere (Uhrich and Benkenstein, 2012; Chen et al., 2013).

Though a few empirical studies mainly outside of the United States have focused on SSA and its influence on spectators' behavior in the context of such sports as soccer, cricket, Australian rules football, and rugby (e.g., Yoshida and James, 2010; Uhrich and Benkenstein, 2012; Chen et al., 2013), there is a call for additional research to assess SSA in several different sports settings in different countries and cultures (e.g., Chen et al., 2013). There is a need of more comprehensive investigations of the college football atmosphere because this sport is popular among intensely loyal fans and has several features that contribute to a very unique game-day environment. Prior research suggests that males and females have different perceptions and responses to retail environments (Otnes and McGrath, 2001) but very little is known about how men and women react to the stadium atmosphere at a college football game (Kahle et al., 2003). No empirical studies have simultaneously investigated the relationship between SSA at college football games and spectator satisfaction and behavior across gender lines. Moreover, prior findings on the extent to which various components of SSA influence fan satisfaction and behavior are inconsistent. The Stimulus-Organism-Response (S-O-R) theory (Mehrabian and Russell, 1974) suggests that environmental stimuli (S) influence an individual's emotional reaction (O), which in turn, affects consumers' behavioral response (R). This suggests that the effect of sports stadium atmospherics on spectators' behavioral intentions may be mediated by customer satisfaction. Therefore, the primary objective of this study is to address the above issues by examining the mediating role of spectator satisfaction in the relationships between the sports stadium atmosphere and male and female fans' behavioral intentions in the context of college football in the United States. The findings of this study may help college football professionals and administration enhance the stadium atmosphere to increase attendance, satisfy spectators, and build loyalty among male and female fans. The document is organized into the following sections: Literature Review, Theoretical Framework and Hypotheses Development, Data and Methodology, Results, Concluding Comments, and References.

LITERATURE REVIEW

Few studies have attempted to understand the multitude of conditions that form the atmosphere within sports stadiums. Early research was limited to spectator perceptions of the "sportscares" (e.g., the physical environment, scoreboards, crowding) (Wakefield et al., 1996). Subsequent research focused on specific aspects of SSA and examined their impact on satisfaction and behavior. Yoshida and James (2010) investigated the extent to which the atmosphere at baseball and football games might influence spectator satisfaction and future intentions at sports events, but they did not specifically look into how the actions of event organizers influenced the atmosphere (e.g., the use of mascots and giveaways and promotions, etc.). Biscaia, Correia, Yoshida, Rosado, and Maroco, J. (2013) investigated spectator satisfaction at soccer matches and suggest that the atmosphere in a sports stadium might influence fan satisfaction. Uhrich and Benkenstein (2012) investigated how the actions of crowds of spectators at sports events might influence future behavior and concluded that spectators were essential co-creators of the experience and the influence of the actions of spectators was far stronger on future behavior than any issues related to the venue. Koenigstorfer et al. (2010) examined how spectators perceived the attractiveness of professional soccer clubs and found the atmosphere of the stadium is a powerful factor influencing spectator perceptions. Karg, McDonald, and Vocino (2008) indicated that the satisfaction of attendance at sports events was often influenced by the extent to which fans perceived the stadium is safe and welcoming.

Bauer, Sauer, and Exler (2005) suggested that the atmosphere in the stadium (as well as the behavior of spectators and the traditions of soccer clubs) has more of an effect on future fan loyalty than the quality of competition, the importance of the game, or the traits of players and coaches. Uhrich and Koengistorfer (2009) expanded the concept of SSA to include the environment at the venue, the attitudes and actions of spectators, and the emotions people experienced at sports events. Chen et al. (2013) developed and validated a comprehensive SSA scale by surveying spectators at professional basketball league games in Taiwan; they advocated that more research be carried out to examine the psychometric properties of SSA measure using non-Asian samples and other spectator sports.

Moreover, previous findings on various components of SSA and their influence on fan satisfaction, to some extent, are contradictory. For example, Wakefield et al. (1996), Sarstedt, Ringle, Raithel, and Gutergan (2014), and Karg, et al. (2008) suggested that the size of the crowd could have a negative effect on SSA (e.g., if sections of the stadium were empty or fans were not cheering on the team). Feelings of crowding (e.g., too many spectators in a confined space) adversely influenced spectators' perceptions of the servicescape and the perceived level of excitement at sports events (Wakefield and Blodgett, 1994). Conversely, Uhrich and Benkenstein (2012) concluded that the actions of spectators in the crowd had a much greater influence in creating a favorable atmosphere than physical elements associated with the stadium architecture. Other researchers point to the presence of a large and vocal crowd as a major positive contributor to SSA (e.g., Biscaia et al., 2013; Uhrich and Benkenstein, 2010). In contrast, Morely and Thomas (2005) suggested the effect of crowds at cricket matches did not create a positive sport stadium atmosphere because attendance was sparse and the sport was not exciting for spectators. Unlike previous studies that established a strong SSA—satisfaction linkage (e.g., Chen et al., 2013), Yoshida and James (2010) found that some dimensions of SSA such as player performance and opponent characteristics did not predict spectators' satisfaction. Sarstedt et al. (2014) found that atmosphere experienced during a visit to a stadium was a weaker predictor of spectator satisfaction than physical aspects of stadium.

Unlike previous studies, the current research contributes to the literature on sports stadium atmosphere in several important ways. First, previous studies primarily relied on the stimulus-response (S-R) paradigm and investigated a direct effect of SSA on behavior. The current study, however, employs the S-O-R framework which holds that the environmental stimuli may not directly influence behavior but such effect is mediated by an individual's affective and cognitive states (i.e., organism). In the SSA context, spectators' behavioral intentions can be driven by their satisfaction level which may be triggered by stadium atmospherics. While the S-O-R theory has been widely applied in retail and other services domains, only a very few studies tested the theory in a sports stadium atmosphere context. We used structural equation modeling which allows for performing simultaneous testing of complex mediating mechanisms with multiple latent variables and testing a path analysis while developing a large number of modeling frameworks (Bollen, 2002; Jöreskog, 1978). Because this study hypothesizes about the complex relationships among one-factor second-ordered SSA construct, spectator satisfaction, and spectators' behavioral intentions, it is critical to use path analysis and validate the proposed mediation model in a holistic way in order to draw meaningful conclusions and implications (Bollen, 1989).

Second, a study by Kahle et al. (2003) indicates that males and females have different perceptions and responses to the atmospherics at sporting events. Little empirical research exists that investigates gender differences in the perceptions of the sports stadium atmosphere. To date, no empirical studies have simultaneously investigated the relationship between SSA, spectator satisfaction, and behavior across gender lines. Thus, the current study aims to fill this gap by examining gender difference in the mediational pathways between sports stadium atmosphere, spectator satisfaction, and behavioral intentions. Third, a few empirical studies mainly outside of the United States have focused on SSA and its influence on fan' behavior in the context of such sports as soccer, cricket, Australian rules football, and rugby (e.g., Yoshida and James, 2010; Uhrich and Benkenstein, 2012; Chen et al., 2013). Chen et al. (2013) called for additional research to assess SSA in several different sports settings in different countries and cultures. The

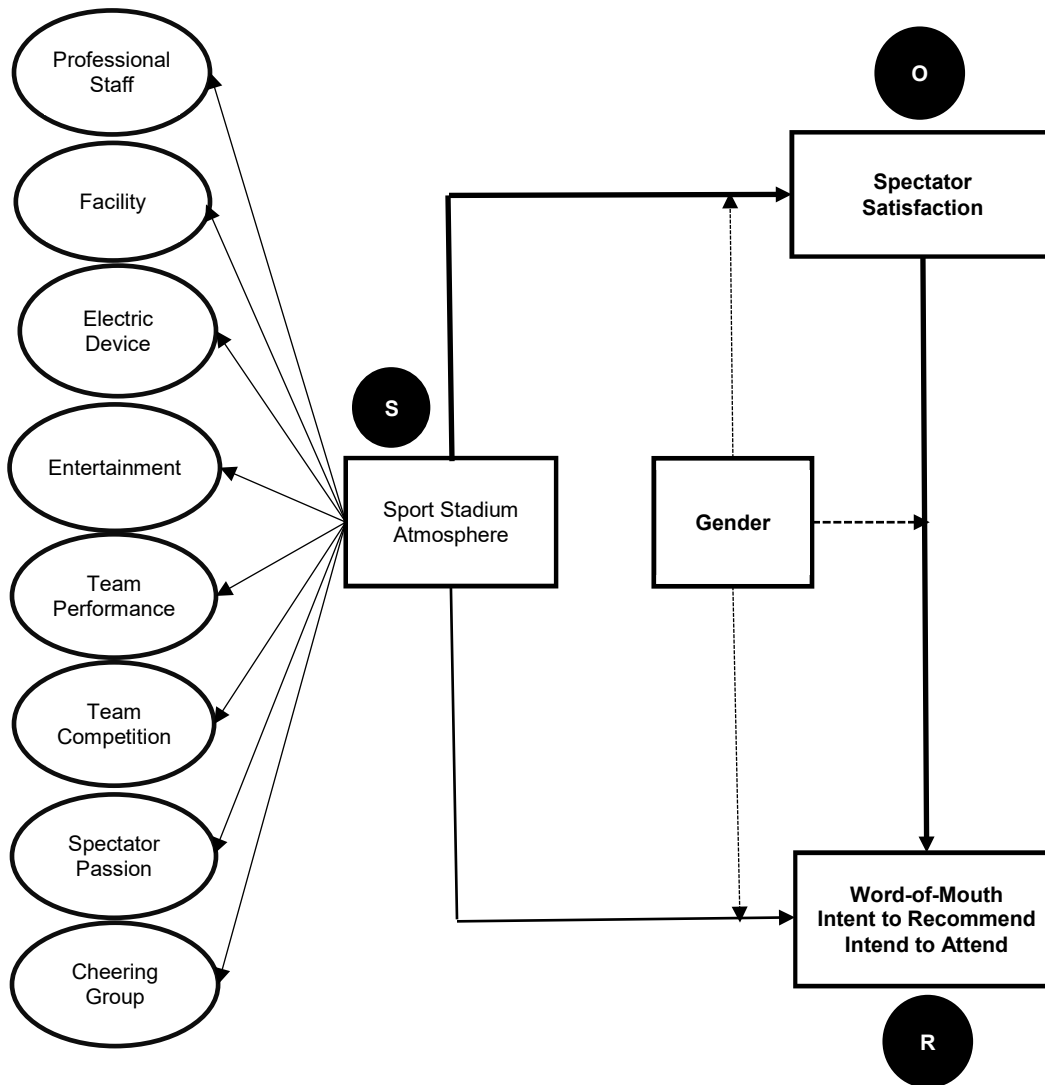
perceptions of SSA may differ across cultures and different types of sports simply because of the diverse nature of events, stadiums, spectators and cultures (Koenigstorfer et al., 2010). Thus, the current study centers on the stadium atmospherics of college football because this sport is unique and popular among intensely loyal fans. College football has several features that contribute to a very unique atmosphere that make it deserving of study.

In the United States, college football has assumed such an important role it is referred to as a new “religion” for large numbers of fanatic spectators (Lewis, 2013). Weeks before a big college football game is played, fanatic supporters of several universities travel long distances to cheer on their school; 50 million fans traveled to college football games in 2014 (Huston, 2014). On the day of the game, fans meet in the parking lot hours before kickoff to tailgate; they drink, eat, talk with friends and fellow students, and reminisce about their loved of the university. For many fans, college football provides a rich and welcoming environment to take part in a time-honored ritual and be part of a collective group that reflects their self-identity (Drenten, Peters, Leigh, and Hollenbeck, 2009). Other aspects that create a unique stadium atmosphere at college football games are marching bands with hundreds of members that play unique battle hymns and fight songs (Bain-Selbo, 2009); cheerleaders who urge the fans to rise, cheer and chant (Wilhalme, 2015), and many college football stadiums present specific and unique traditions (Smith, 2001). Finally, despite the fact that sports stadium atmosphere includes a wide range of factors, previous studies measured only a few but diverse aspects of SSA. These efforts focused primarily on physical aspects (e.g., the building layout, seating) and offered inconsistent findings as discussed earlier. Thus, the current study will operationalize SSA as a second-order as well as a much broader and holistic construct composed of eight dimensions as shown in Figure 1.

Theoretical Framework and Hypotheses Development

In line with the S-O-R model, the proposed causal framework in this study (see Figure 1) posits that spectator satisfaction plays an essential role in explaining the relationship between SSA and behavioral intentions. The SSA is composed of eight second-order constructs: professional staff (e.g., role of stadium announcer and coaches in encouraging spectators in the stadium), facility (i.e., quality of facility, unique architecture, comfortable seating in the stadium), electric device (e.g., lighting, music, screen scoreboard, acoustics in the stadium), entertainment (e.g., half-time show, giveaways, mascots, promotion activities, player-spectator interactions in the stadium), team performance (e.g., overall performance of teams in the stadium), team competition (e.g., rivalry and competitiveness between teams in the stadium), spectator passion (e.g., large number of intense and vocal spectators in the stadium), and cheering groups (e.g., performance of cheerleaders, cheering and maneuvers performed by spectators at the stadium). The behavioral intentions include word-of-mouth, intent to recommend, and intent to attend. In this study, spectator satisfaction is defined as a spectator’s pleasurable, fulfillment response to the entertainment of sport competition and/or ancillary services provided during a sporting event (Yoshida and James, 2010). Figure 1 shows the hypothesized relationships between dimensions that contribute to sports stadium atmosphere (e.g., professional staff, the facility, electric devices, entertainment, team performance, team competition, spectator passion, and cheering groups), spectator satisfaction, and behavioral intentions (e.g., word-of-mouth, intent to recommend, and intent to attend) as well as the moderating role of gender.

Figure 1: A Framework of Sports Stadium Atmosphere



This figure shows the hypothesized relationships between dimensions that contribute to sports stadium atmosphere, spectator satisfaction, and behavioral intentions, as well as the moderating role of gender.

Previous research in retailing suggests that a store environment can influence a wide variety of consumer evaluations and behaviors (Turley and Milliman, 2000). For example, store atmosphere affects store patronage behaviors such as repurchase and recommendation intention (Baker, Levy, and Grewal, 1992; Baker, Parasuraman, Grewal, and Voss, 2002; Grewal, Baker, Levy, and Voss, 2003). In a sports context, stadium atmosphere can affect fan’s behavior. Chen et al. (2013) found a positive relationship between sports stadium atmosphere and spectators’ intentions to attend sporting events. Uhrich and Benkenstein (2010) argue that stadium atmosphere can directly influence spectators’ short-term behaviors (e.g., the amount of money spectators spend at the stadium) as well as long-term behaviors (e.g., identification with the team or the image of the club, and purchases of season tickets or club membership). Based on above arguments, we hypothesize the following.

H1: Sports stadium atmosphere is positively related to: a) positive word-of-mouth, b) intent to recommend, and c) intent to attend.

Prior studies suggest that the atmosphere at a sports event can influence spectator satisfaction. Uhrich and Koenigstorfer (2009) proposed a conceptual framework which suggests SSA is a primary driver of spectator satisfaction. Yoshida and James (2010) suggested that the extent to which the game was thought to be exciting was an important component of atmosphere that influenced satisfaction. The extent that the atmosphere of the game lived up to fan expectations is an important predictor of spectator satisfaction (Kelley and Turley, 2001). Centieiro (2013) suggests that fans who experience the excitement of the stadium atmosphere are likely to be more engaged and thus more satisfied. Similarly, Karg et al. (2008) found that season ticket holders were more satisfied with sports clubs that provided a safe and welcoming sport stadium atmosphere than venues that were hostile and dangerous. Thus, based on above, we predict the following.

H2: Sports stadium atmosphere is positively related to spectator satisfaction

Literature indicates that customers who express a high level of satisfaction at sports events are more likely to exhibit such positive fan behaviors as willingness to attend additional games, purchase merchandise, and follow a sports team in the mass media (Yoshida and James, 2010; Chen et al., 2013). Biscaia et al. (2013) indicate that fan satisfaction plays a role in influencing future behavioral intentions. An empirical study by Uhrich and Benkenstein (2012) suggest that satisfaction with the sport stadium atmosphere is positively correlated with increased spending at sports events. In a conceptual study, Uhrich and Koenigstorfer (2009) proposed that a sports stadium atmosphere that satisfies fans could result in increases in long-term fandom, positive word-of-mouth, and heightened sales of tickets and merchandise. Thus, we posit the following hypothesis.

H3: Spectator satisfaction is positively related to: a) positive word-of-mouth, b) intent to recommend, and c) intent to attend.

In a retail setting, a number of studies demonstrate that consumers' cognitive and emotional states can mediate the effects of servicescapes (the built physical environment where a product or service is purchased, Bitner, 1992) on behavioral reactions (Baker et al., 1992; Baker, Baker, Grewal, and Parasuraman, 1994). A large body of service marketing quality literature suggests that customer satisfaction (i.e., a pleasurable or positive emotional state felt by a customer with a product or service) is a key intervening variable in the relationship between service quality, customer loyalty and future behavior (Cronin and Taylor, 1992; Anderson, Fornell, and Lehmann, 1994; Gotlieb, Grewal, Brown, Dacin, and Gunst, 1994). In sports contexts, research suggests that fan satisfaction may play a mediating role in shaping perceptions of service quality attributes (e.g., the quality of effort put forth by individuals working at the stadium to meet the needs of spectators such as ushers, ticket-takers, food vendors and security personnel, etc.) and behavioral intentions (Biscaia et al., 2013; Javadein, Khanlari, and Estiri, 2008). Spectators' perceptions of stadium quality can be indirectly linked to future intentions via spectators' satisfaction with the stadium atmospherics (Wakefield and Blodgett, 1994). These arguments suggest that spectator satisfaction can mediate the impact of sports stadium atmosphere on spectators' behavioral intentions. From a theoretical perspective, one way of viewing the atmosphere at sports stadium is through the broad framework of the S-O-R model. The concept of S-O-R model was introduced by Mehrabian and Russell (1974) based in the environmental psychology theory. The theory posits that social stimuli in the environment (the stimulus) directly influence the affective and cognitive state of individuals (the organism), thereby influencing behaviors (the response). A few studies have examined the S-O-R theory in different service-related settings including online casinos (Abarbanel, 2013), servicescapes (Yi and Gong, 2009), and online retailing (Eroglu, Machleit, and Davis, 2003). The current study employs the S-O-R model to understand how spectator's satisfaction (the organism) can mediate the effect of stadium atmosphere (the stimulus) on word-of-mouth, recommendation intention, and attendance intention (the responses). The rationale is that the atmospheric-related stimuli in a college football stadium (e.g., physical facility, electric devices, team

competition, quality of the game, etc.) should influence spectator's satisfaction (Oliver, 1997; Yi and Gong, 2009) which ultimately influences behavioral intentions.

From a methodological perspective, one rationale for why the spectator satisfaction can serve as a mediator is that it is an internal psychological state variable that is affected by external events. In the marketing literature, customer satisfaction has consistently been theorized as a mediator in the relationship between conditions that make up the service environment and consumer behavior because it affects the cognitive and affective response of consumers to service encounters (Oliver, 1997). Baron and Kenny (1986) suggest using a mediating variable in the case of a strong relationship between a predictor and a dependent variable. Since spectator satisfaction has been hypothesized to have a strong association with both sports stadium atmosphere and spectators' behavioral intentions, we hypothesize that SSA has a positive relationship with behavioral intention when spectator satisfaction is considered as intervening factor.

H4: Spectator satisfaction will mediate the relationship between sports stadium atmosphere and positive word-of-mouth.

H5: Spectator satisfaction will mediate the relationship between sports stadium atmosphere and intent to recommend.

H6: Spectator satisfaction will mediate the relationship between sports stadium atmosphere and intent to attend.

Prior studies in marketing and related fields indicate that men and women differ in evaluating retail environment (Otnes and McGrath, 2001; Grewal et al., 2003). For example, men evaluated the store atmosphere less positively than did women (Grewal et al., 2003). Men and women can differ in their perceptions of atmospheric factors at sporting events; women may place more emphasis on the courteousness of staff, facility, and hospitality but men may emphasize secondary entertainment factors, such as the noise generated by bands and fans at the stadium (Kahle et al., 2003). Although sports spectatorship and fandom have traditionally been believed to be a male activity, the importance of the rapidly growing number of female sports fans is now recognized (Clark, Apostolopoulou, and Gladden, 2009; Bush, Bush, Clark, and Bush, 2005). However, research suggests that gender differences may exist in regard to sports fandom, satisfaction, and behaviors (Fink, Trail, and Anderson, 2002; Wann, Waddill, and Dunham, 2004). Research indicates that men show a greater interest in sports, watch more sports on television, and spend time discussing sports than females (Dietz-Uhler, Harrick, End, and Jacquemotte, 2000). Females are more likely to be sports fans because they attend or watch games with friends and family while male spectators are fans because they play sports (James and Riddinger, 2002).

Social identity theory (Tajfel, 2010) can be useful in understanding how males and females can react differently to sports stadium atmosphere and its effect on their emotional states and behaviors. The former theory holds that individuals attain a sense of belonging in particular groups and derive much of their self-esteem from their memberships in social groups or categories. When applied in a sports context, social identity theory suggests male fans can gain a higher level of sense of membership and belonging with sports or a team because this relationship enhances self-esteem and reinforces masculine values (Costa and Guthrie, 1994). Males are often more likely than females to be avid fans, to watch and follow sports more often, and to be fans of a specific team (James and Riddinger, 2002). Gender socialization theory suggests that men and women learn different gender-appropriate roles through social learning processes as a result they develop different attitudes and behaviors (Carter, 2014). The theory suggests that male and female spectators may evaluate stadium atmospherics in a different way and exhibit different levels of satisfaction as well as behavioral intentions (Chen et al., 2013). Based on the above supporting literature and theories, we hypothesize the following.

H7: Gender moderates the hypothesized pathways between sports stadium atmosphere, spectator satisfaction, and behavioral intentions (word-of-mouth, intent to recommend, and intent to attend).

DATA AND METHODOLOGY

Data were collected using a mall-intercept technique at MetLife Stadium during a 2014 college football game between Notre Dame University and Syracuse University. This event was played at a neutral site in a large urban area and as a result many of the spectators were not fans of either team but merely wanted to come experience this event. Sixteen field researchers randomly approached participants and invited spectators to participate in the survey just after the halftime show was completed. A total of 217 individual participated in the survey. After removing six incomplete cases, a total of 211 usable surveys were obtained. The majority of the participants were neither Notre Dame nor Syracuse fans. Almost one-fifth (21.3%) of the participants indicated they were Notre Dame die-hard fans and only 15.2 percent of them were avid Syracuse fans. More participants were males (57.3%) than females (42.7%). About three out of ten participants (29.4%) attended at least one NFL game and 34.1 percent attended college football game in the past year. Table 1 shows the summary of measurement items which were measured on a 5-point Likert-type scale ranging from “1 = strongly disagree” to “5 = strongly agree.” Sports stadium atmosphere was measured using the SSA scale adapted from Chen et al. (2013). As shown in Figure 1, the scale is composed of eight multi-item dimensions: professional staff, facility, electric device, entertainment, team performance, team competitions, spectator passion, and cheering group. Spectator satisfaction was assessed with three items adapted from Yoshida and James (2010).

The sample items in this scale were: “I am satisfied with this game at X Stadium.” and “I am delighted with this game at X Stadium”. Behavior intention measure included three aspects: intent to attend future games, intent to recommend, and intent to spread positive word-of-mouth. Intent to attend was assessed using a three-item scale adapted from Hagger, Chatzisarantis, and Biddle (2001) and Cunningham and Kwon (2003). Intent to recommend future events at the stadium was measured with two items adapted from Brown et al. (2005) and Uhrich and Benkenstein (2012). To assess intent to spread positive word-of-mouth, three items were adapted from Zeithaml, Berry, and Parasuraman (1996) which were slightly modified to fit the context of this study. First, the confirmatory factor analysis (CFA) was conducted for each key variable in order to examine the construct validity of measured variables. Second, we estimated measures of central tendency (mean), standard deviations, and correlations among key variables to describe the characteristics of respondents. The reliability of the instrument and its scales were measured by calculating Cronbach’s alpha for each scale. Third, structural equation modeling was used to examine the associations and mediation effect of key variables for this study.

RESULTS

The construct reliability ranges from 0.84 to 0.90, higher than recommended level of 0.60 and average variance extracted (AVE) estimates for all hypothesized constructs are higher than recommended level of 0.50 with the exception for the SSA construct (Bagozzi and Yi, 1988; Fornell and Larcker, 1981). The CFA was used because key variables of this study were driven by the theoretical relationship among the observed and unobserved variables (Schreiber, Amaury, Barlow, and King, 2006). Particularly, CFA was deemed the appropriate statistical technique because it is commonly used when there is a theoretical rationale for an a priori factor structure such as positive psychological capital (Luthans, Norman, Avolio, and Avey, 2008). We conducted CFA tests to assess the validity of the proposed measurements and estimated the quality of structural reliabilities and designated factor loading by testing the model fit between the proposed measurement models and the collected data.

Initially the factor loading criteria was set as greater than 0.50 considering the rule of thumb that less than 0.40 is weak and equal or greater than 0.60 is strong (Cabrera-Nguyen, 2010). CFA results of SSA indicated

that the entertainment (0.22) and cheering group (0.38) measurements had poor factor loadings that were significantly less than .50. In addition, the item of ‘importance’ in the Team competition measurement had a poor factor loading (0.25). The factor loadings for remaining SSA items were significant and higher than 0.5 and retained for the analysis. All factor loadings of spectator satisfaction (0.82 ~ 0.84) and spectators’ behavioral intentions (0.76 ~ 0.94) were above the minimum factor loading criteria, which provides an initial support for convergent validity (Gerbing and Anderson, 1988). Table 1 shows the measurement items and standardized factor loadings, average variance extracted, and construct reliability.

Table 1: Measurement Items and Standardized Factor Loadings, Average Variance Extracted (AVE) and Construct Reliability

Construct	Latent Construct	FL	CR	AVE	Observed item	FL
SSA	Electric Device	0.70	0.84	0.48	The lighting is great in X Stadium.	0.71
					The music is exciting in X Stadium.	0.70
					The big screen scoreboard is great in X Stadium.	0.67
	Facility	0.58			The acoustics are encouraging in X Stadium.	0.58
					Seating is comfortable in the X Stadium.	0.57
					The architecture of X Stadium is unique.	0.65
	Team performance	0.89			The quality of the facility is great in X Stadium.	0.73
					Fans are excited when their team scores in X Stadium.	0.64
					The morale of these teams was intense in X Stadium.	0.70
	Spectator passion	0.70			The overall performance of my team is great in this game in X Stadium.	0.56
					There were a large number of fans at this game at X Stadium.	0.72
					The support of fans was intense in X Stadium.	0.88
	Professional staff	0.52			The passion of fans was intense in X Stadium.	0.88
					The stadium announcer encouraged fans in X Stadium.	0.75
The behavior of the coaches encouraged fans in X Stadium.					0.51	
Team competition	0.68			The rivalry between these teams was emphasized in X Stadium.	0.71	
				The competitiveness between these teams was intense in X Stadium.	0.91	
Spectator Satisfaction	0.83	0.87	0.69	I am satisfied with this game at X Stadium.	0.84	
				I am happy with this game at X Stadium.	0.84	
				I am delighted with this game at X Stadium.	0.82	
Spectators’ Behavioral Intentions	Intent to attend	0.85	0.90	0.75	I intend to attend another football game at X Stadium.	0.76
					Attending another football game at X Stadium is something I plan to do.	0.92
	Intent to recommend	0.90	0.87	0.77	I try to attend another football game at X Stadium.	0.91
					I am likely to recommend someone to attend a football game at X Stadium.	0.91
	Word of mouth	0.84	0.90	0.75	I will probably recommend to others to attend a football game at X Stadium.	0.84
					I am likely to encourage friends and family to attend a football game at X Stadium.	0.76
					I am likely to say positive things about X Stadium.	0.94
					I will probably spread a positive word-of-mouth about X Stadium.	0.89

This table shows the measurement items and standardized factor loadings, average variance extracted, and construct reliability. FL: Factor loading criteria >0.50; CR: Construct Reliability >0.70; AVE: Average Variance Extracted (AVE) >0.47; SSA: Sports Stadium Atmosphere. All $p < 0.001$.

To assess the model fit, several fit indices including chi-square (χ^2), degrees of freedom (df), probability (p), root mean square error of approximation ($RMSEA$), the comparative fit index (CFI), and the Tucker-Lewis index (TLI) were used. Basing on the generally accepted rules (Hair, Black, Babin, and Anderson, 2010; Hu and Bentler, 1999; Kline, 2010; MacCallum, Browne, and Sugawara, 1996), several cutoff criteria were set and used to assess the model fit. The confirmatory factor analysis results of the proposed models fitted the data at an acceptable level (Model 1: $\chi^2_{(221)} = 386.3$, $p < .00$, $CFI = .92$, $TLI = .91$, $RMSEA = .06$; Model 2: $\chi^2_{(200)} = 362.8$, $p < .00$, $CFI = .91$, $TLI = .90$, $RMSEA = .06$; Model 3: $\chi^2_{(221)} = 410$, $p < .00$, $CFI = .91$,

$TLI = .90$, $RMSEA = .06$). Table 2 presents means, standard deviations, and correlations among key study variables including fan satisfaction, intent to attend, intent to recommend, and word-of-mouth.

Table 2: Means, Standard Deviations, and Correlations Among Key Variables

N = 211		M	SD	1	2	3	4	5
1.	SSA	3.74	0.44	1				
2.	Satisfaction	4.06	0.74	0.59**	1			
3.	Intend to attend	4.10	0.88	0.40**	0.49**	1		
4.	Intend to recommend	4.12	0.85	0.42**	0.49**	0.71**	1	
5.	Word-of-mouth	4.18	0.74	0.51**	0.57**	0.69**	0.77**	1

This table displays the means, standard deviations, and correlations among key variables, including fan satisfaction, intent to attend, intent to recommend, and word-of-mouth. Note that * $p < .05$ (two-tailed); ** $p < .01$ (two-tailed).

Structural equation modeling was performed using the Stata 14 program to examine the relationship between key variables and mediation effect of spectator satisfaction between sports stadium atmosphere and spectators’ behavioral intentions. In Hypotheses 1a-1c, we posited that sports stadium atmosphere would be positively related to positive word-of-mouth, intent to recommend, and intent to attend. As shown in Table 3, these hypotheses were not supported. The results indicated that there was a significant positive relationship between sports stadium atmosphere and spectator satisfaction, thus supporting Hypothesis 2 ($\beta > 0.781$, $p < 0.001$). Consistent with Hypotheses 3a-3c, the results provide strong evidence that spectator satisfaction is positively related to positive word-of-mouth, intent to recommend, and intent to attend ($\beta = 0.361 \sim 0.559$, $p < 0.01$). Table 3 presents standardized coefficients, standard errors, and probability about the extent to which the research hypotheses were proven to be associated with the intent to attend, the intent to recommend, and the intent to spread positive word-of-mouth.

Table 3: Standardized Coefficients, Standard Errors, and Probability

Path to Dependent Variables	Attend			Recommend			Word-Of-Mouth		
	β	SE	$p > z $	β	SE	$p > z $	β	SE	$p > z $
Structural									
H1 SSA → Spectator behavior									
H1a: SSA → Attend	0.204	0.141	0.147						
H1b: SSA → Recommend				0.167	0.137	0.222			
H1c: SSA → WOM							0.100	0.139	0.471
H2 SSA → Spectator satisfaction	0.781	0.045	0.000	0.782	0.045	0.000	0.785	0.045	0.000
H3 Spectator satisfaction → Spectator behavior									
H3a: Spectator satisfaction → Attend	0.361	0.136	0.008						
H3b: Spectator satisfaction → Recommend				0.411	0.13	0.002			
H3c: Spectator satisfaction → WOM							0.559	0.130	0.000
Measurement (latent)									
SSA → Electric device	0.675	0.060	0.000	0.688	0.059	0.000	0.678	0.060	0.000
SSA → Facility	0.568	0.076	0.000	0.571	0.076	0.000	0.590	0.076	0.000
SSA → Team performance	0.914	0.052	0.000	0.911	0.052	0.000	0.904	0.053	0.000
SSA → Spectator passion	0.678	0.953	0.000	0.673	0.054	0.000	0.670	0.054	0.000
SSA → Professional staff	0.422	0.116	0.000	0.424	0.117	0.000	0.441	0.114	0.000
SSA → Team competition	0.684	0.060	0.000	0.677	0.061	0.000	0.691	0.060	0.000

Table 3 presents standardized coefficients, standard errors, and probability about the extent to which the research hypotheses were proven to be associated with the intent to attend, the intent to recommend, and the intent to spread positive word-of-mouth. Note that WOM: word-of-mouth. SSA: sports stadium atmosphere. β = standardized coefficient. SE: standard error

In Hypotheses 4, 5, and 6, we hypothesized mediating effects of satisfaction on the relationships between SSA and behavioral intentions. As shown in Table 4, the results show that spectator satisfaction mediated the relationships between sports stadium atmosphere and positive word-of-mouth, intent to recommend, and intent to attend ($\beta = 0.487 \sim 0.539, p < 0.05$). Thus, all three hypotheses received support. Table 4 shows the associations between spectator satisfaction, sports stadium atmosphere, and positive word-of-mouth, intent to recommend, and intent to attend.

Table 4: Direct Effects of Sports Stadium Atmosphere and Indirect Effects on Spectator Behaviors

Path			Total Effect	Direct Effect	Indirect Effect
SSA	→	Intend to attend	0.487*** (0.000)	0.205 (0.157)	0.282** (0.016)
SSA	→	Intend to recommend	0.489*** (0.000)	0.167 (0.225)	0.322*** (0.005)
SSA	→	Word of mouth	0.539*** (0.000)	0.100 (0.474)	0.439*** (0.001)

*This table shows the associations between spectator satisfaction, sports stadium atmosphere, and positive word-of-mouth, intent to recommend, and intent to attend. Note that SSA: Sports stadium atmosphere. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. The coefficients are standardized values. Values in parenthesis are probability of $|p| < z$.*

Hypothesis 7 predicted that gender would moderate the hypothesized pathways between sports stadium atmosphere, spectator satisfaction, and behavioral intentions. Table V shows the results which reveal that the hypothesized relationships differ by gender. The mediation effects of spectator satisfaction on the relationships between SSA and attendance and recommendation intentions are evident for females ($\beta = 0.288 \sim 0.369, p < 0.05$) while such effects were not observed for males. The mediation effect between SSA and word-of-mouth is significant for both males ($\beta = 0.418, p < 0.05$) and females ($\beta = 0.423, p < 0.05$). Thus, Hypothesis 7 is partially supported. Table 5 shows the extent to which the mediation effects of spectator satisfaction between sports stadium atmosphere and behavioral intentions vary between male and female spectators.

Table 5: Mediation Effects of Spectator Satisfaction Between SSA and Behavioral Intentions Across Genders

	Male		Female	
	Coefficient	<i>P</i>	Coefficient	<i>p</i>
Intend to Attend	0.236	0.177	0.288**	0.055
Intend to Recommend	0.263	0.119	0.369**	0.024
Word-of-Mouth	0.418**	0.022	0.423**	0.015

This table shows the extent to which the mediation effects of spectator satisfaction between sports stadium atmosphere and behavioral intentions vary between male and female spectators.

CONCLUDING COMMENTS

The goal of this study is to examine the mediating role of spectator satisfaction in the relationships between the sports stadium atmosphere and male and female fans' behavioral intentions in the context of college football in the United States. Data were collected using a mall-intercept technique at MetLife Stadium during a 2014 college football game between Notre Dame University and Syracuse University. This event was played at a neutral site in a large urban area and as a result many of the spectators were not fans of either team. Sixteen field researchers randomly approached participants and invited spectators to participate in the survey just after the halftime show was completed. A total of 217 individual participated in the survey. After removing six incomplete cases, a total of 211 usable surveys were obtained. Research hypotheses 1a-1c (in which it was posited that sports stadium atmosphere would be positively related to positive word-of-mouth, intent to recommend, and intent to attend) were not supported. Research hypothesis 2 (which posited

there was a significant positive relationship between sports stadium atmosphere and spectator satisfaction) was supported. Research hypothesis 3 (which posited spectator satisfaction is positively related to positive word-of-mouth, intent to recommend, and intent to attend) was supported. Research hypotheses 4, 5, and 6 (which posited that spectator satisfaction may have mediating effects of satisfaction on the relationships between sports stadium atmosphere and positive word-of-mouth, intent to recommend, and intent to attend) received support. Research hypothesis 7 (which posited that gender would moderate the hypothesized pathways between sports stadium atmosphere, spectator satisfaction, and behavioral intentions) was partially supported; the mediation effect between SSA and word-of-mouth is significant for both males and females, but the mediation effects of spectator satisfaction on the relationships between sport stadium atmosphere and attendance and recommendation intentions are evident for females but not for males.

The primary finding of this study is that the sports stadium atmosphere does not directly influence spectators' behavioral intentions but spectator satisfaction mediates the impact of SSA on fan future behavior. This means improved stadium atmosphere leads to spectator satisfaction which ultimately influences such spectators' behavioral intentions as future attendance, recommendation intention, and positive word-of-mouth. However, mere improvement in sports stadium atmosphere may not enhance spectators' behavioral intentions unless fans are satisfied with the game and stadium atmospherics. From a managerial point of view, investing resources only in improving a stadium atmosphere will likely be inadequate unless the fans are satisfied with the experience at the stadium. Thus, resources have to be allocated to design and implement programs to improve spectator satisfaction (e.g., customer relationship management, spectator loyalty programs, and unique privileges for season ticket holders). Sports stadium managers must be committed to providing excellent services (e.g., courteous employees such as ushers and security personnel, timely resolution of spectator complaints, rapid delivery of quality foods and beverages, resolving spectator concerns by working with fans on a one-one basis, etc.).

Stadium managers may want to improve the ways fans can communicate with the club (e.g., expanded stadium wi-fi and improved social media programs) (Williams and Chinn, 2010), and develop long-term customer loyalty programs that make fans feel like valued customers (Kaplan, 2014). That being said, the best solution is to work simultaneously on creating a great atmosphere and working to make fans feel truly pleased and satisfied with the experience at sports events. To develop excellent stadium atmospherics and to enhance spectator experience and satisfaction, sports marketers should focus on developing and managing various elements of SSA including stadium facility, electric devices, professional staff, team competition and performance, and spectator passion. The sports stadium atmosphere can be enhanced by manipulating specific aspects. For example, the Seattle Seahawks have been praised for developing an exciting stadium atmosphere via a unique architecture designed to keep crowd noise inside the facility and actions of stadium staff to urge the fans to yell and cheer (Saraf, 2014). In contrast, there are prominent evidences in which the stadium atmospherics were believed to be deficient; after a recent UEFA Champions League home match, Chelsea FC coach Jose Mourinho complained about the poor lighting and the sparse attendance that created the stadium atmosphere he compared to "a library" in which the fans were quiet throughout the match (Nagle, 2014).

This study has shown that there are differences between men and women in their emotional expressions (e.g., satisfaction) to a sporting event at a stadium and their behavioral intentions (e.g., intent to recommend and future attendance). This may suggest that when developing stadium atmosphere and creating a successful sporting event, stadium managers should employ different strategies for male and female spectators; when marketing to men, the emphasis should focus on such aspects as the quality of play, the skills of athletes, and the level of competition while marketing to female fans should emphasize the opportunities for socialization and entertainment. From a theoretical perspective, this study contributes to the literature by applying Mehrabian and Russell's Stimulus-Organism-Response framework in a sports context. The results support the thesis of the S-O-R model which found an indirect effect of stadium atmosphere on behavioral intentions via satisfaction. Since spectators' perceptions of sports stadium

atmosphere may differ across cultures and different types of sports, researchers called for further research to assess stadium atmospherics in several different sports settings in different countries and cultures (Koenigstorfer et al., 2010; Chen et al., 2013). Our sample participants included spectators attending American college football thus the study contributes to the literature by extending the generalizability of the SSA measure developed by Chen et al. (2013); this study examined the external validity and psychometric properties of the measure in the context of stadium atmosphere at an American college football game. Our findings demonstrate that SSA can be operationalized as a second-order construct composed of electric device, facility, professional staff, spectator passion, team competition, and team performance. This study suffers from a number of limitations.

A major limitation is its cross-sectional design in which data were collected at a single sporting event; thus future research should employ longitudinal designs to examine the proposed relationships by collecting data over a period of time. The study is also limited in that the spectators at this event included many individuals who were not fans of either team; it will be useful to examine stadium atmosphere at typical home games where much of the crowd consists of avid and loyal fans. Future research needs to be conducted to better understand the factors that influence stadium atmospherics and the extent to which stadium atmosphere and customer satisfaction influences key marketing outcomes among fans of different genders. Future studies could study the same sport (e.g., basketball, soccer, etc.) played in different nations and cultures. Other research could investigate the moderating effects of other demographic constructs (e.g., age, ethnicity, geographic regions) psychographic characteristics (e.g., attachment to sports, need for uniqueness, intrinsic motivation, sense for nostalgia, etc.) when reexamining the hypothesized relationships between sport stadium atmosphere, customer satisfaction, and behavioral intentions.

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SOCIAL RESPONSIBILITY AND FINANCIAL PERFORMANCE: EVIDENCE FROM GOODS AND SERVICE FIRMS IN MEXICO

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ABSTRACT

In Corporate Social Responsibility literature, the empirical evidence indicates that adopting a social responsibility program increases firm's financial performance. However, in Mexico few firms are involved in responsible programs and there is little knowledge about their impact in financial performance. The purpose of this study is to analyze the relation between social responsibility and financial performance in Mexican firms participating in an environmental voluntary program in the goods and services sector. We collected information of 41 firms belonging to the goods and services sector, featured in Cable News Network Expansion magazine in the ranking of the 500 most successful firms in Mexico. Firms that participated in an environmental auditing program of the Procuraduría Federal de Protección al Ambiente (Federal Attorney for Environmental Protection) was analyzed. By means of regression analysis, we found that corporate social responsibility programs determine the financial performance of firms. Moderating the effects of company size, the relation's coefficient decreases lightly, but does not lose importance. We conclude that environmental responsibility programs modify the financial performance of firms. Through these programs Mexican firms optimize their energy, water, and reduce their operating costs.

JEL: M14, M21, Q56, C10

KEYWORDS: National Environmental Audit Program, Corporate Social Responsibility, Environmental Quality Certification.

INTRODUCTION

Corporate Social Responsibility (CSR) as a concept has become strong in the last three decades, through the pressure of social groups. These groups have the idea of making companies admit their operating responsibility and social obligations (Frederick, 1978, Cochran, 2007). Taking this into consideration, CSR started with ethical obligations as a response to stakeholders' pressure (Bowen 1970, Carroll, 1979, Wartick & Cochran, 1985). Nevertheless, through time, other obligations have been included, such as: economic (Friedman, 1970) social and political power of institutions (Davis & Blomstrom, 1975), and executive director's philanthropy and values (Freeman 1984, Mahon & McGowan, 1991; Gladwin, Kennelly & Krause 1995). Bowen (1970), states that the diversity of obligations in companies has created a debate in the CSR literature between economics and ethics. From the ethics perspective, the main responsibility of enterprises is towards society and stakeholders. On the other hand, from economic perspective the responsibility of any company is profitability and shareholders. According to Friedman (1970), debates about CSR stand out, because of their vague analysis and lack of accuracy. Firms do not have responsibilities, but persons do have responsibilities, and the unique executive director's responsibility is to look after company profitability. This argument has been supported in different studies that explain the relation connecting CSR and the financial performance of the firms (Cochran & Wood 1984; Ullman 1985, Griffin & Mahon, 1997).

In the “business world” and its relation with environmental responsibility, most decisions taken by directors are influenced by their participation in CSR programs, voluntarily or obligatory. In these administrative decisions, stakeholders have gained an important role (Cochran & Wood 1984, Pava & Krause 1996). For instance, some firms started to participate in a CSR program because they were exposed to be involved in unethical CSR practices. They are forced to make payments via social responsibility programs. These actions, have resulted in a competitive advantage for some firms (Porter & Kramer, 2006; Husted & Allen 2007).

Some companies used CSR programs as tools for implementing business strategies and achieve better corporate results. Several countries have implemented measures for the regulation of companies’ obligations using social responsibility programs. Europe regulates firm responsibility by the use of EIRIS (Ethical Investment Research Services). This service, measures company environmental social indicators. In the United States of America the program called TRI (Toxic Release Inventory), measures the toxic releases of companies regulated by north-American law. Developing economies make use of social responsibility indicators such as ETHOS. This denominated “think tank”, represents a tool that allows companies to elaborate sustainable development initiatives and commitment with their stakeholders. In Mexico, PROFEPA (Federal Attorney for Environmental Protection) is a federal organism that regulates environmental responsibility of corporations through clean industry and environmental quality programs. These programs are based on guidelines required by General Law on Ecological balance and Environmental Protection in the Field of Self-regulation and Environmental. This organism measures the enterprises environmental performance indicators. PROFEPA manages and regulates the National Environmental Audit Program (PNAA), since 1992. Currently, 1145 companies from the three economy sectors (primary, secondary and tertiary) own an environmental certification. This institution operates with three certifications: Clean Industry, Environmental Quality and, Environmental Quality Tourism

From all 1145 companies in the National Audit Program (PNAA), 32.4% are from the goods and services sector have environmental quality certification. However, in this sector there exist close to 23,313 companies. Thus only 4.9% participate in the environmental responsibility program by PROFEPA. The low index of voluntary participation of these companies in environmental responsibility programs represents an enormous challenge for the institutions to increase Mexican companies’ participation. Montiel and Husted (2009) state that participating in an environmental responsibility program such as PNAA, supports the corporations to establish an efficient environmental policy and look after its compliance; these actions bring as a result consumption reduction and economic savings. According to Foster, (2010) clean industry certification helps enterprises to reduce toxic emission levels and let companies to be inspection free while they have the certification.

The results of environmental responsibility programs, as the mentioned PNAA are not well known, due to the low participation of companies. The program has operated for 20 years, and few companies have kept participating. A smaller amount has obtained the certification. In 2010, quality certifications have been diversified to allow enterprises of all sectors to take part in the PNAA program. Nevertheless, in actual time, the number of certified enterprises dropped 15.4%. The purpose of this investigation is the analysis of Mexican companies incorporated in the goods and services sector participating in the National Environmental Audit Program. We examine their financial performance. We aim to provide evidence and comprehend how social responsibility programs transform financial performance of enterprises that have been certified and regulated by public institutions through voluntary programs. In this way they make implications for public policy and corporate sector so the benefits of a social responsibility program can be perceived. The remainder of this investigation is structured as follows: initially the literature reviewed about CSR and financial performance is described, then the method used for data collection and data analysis, finally the results are presented and discussed and the implications are concluded.

LITERATURE REVIEW

At the beginning of 70's, interest in the relationship between financial performance and corporate social responsibility started to arise from different theoretical perspectives and with different results (Friedman 1970; Bowman, 1975; McGuire Sundgren & Shneeweis, 1988; Cochran & Wood 1984; Porter, 2006; Husted & Salazar 2006, Orsato 2006, Prakesh 2012). A summary of their theoretical approach is given in Table 1. Theoretical debate about the relationship between corporate social responsibility, and financial performance has increased in the last three decades (Friedman 1970; Cochran & Wood 1984; Ullmann 1985). The shareholder's approach states that the only two responsibilities of companies are: rendering of accounts to shareholders and maximization of the firm's profitability or value (Friedman 1970). This view considers a risk to bet on society-company interaction, such as CSR. If a firm generates income by investing in providing services to improve society, it has to be taken in consideration. However, if covering some social demands is only generating costs, they have to be rejected (Chrisman & Carroll, 1984).

Table 1: Theoretical Approach

Author	Theoretical Approach	Assumption	Variables	Implications
Friedman 1970	Shareholder value theory. <i>Shareholder Theory.</i>	Any investment in social demands must generate an increase in shareholders' stocks value.	Capital Shareholder	Shareholder wealth maximization as priority, as a reference in decision-making.
Carroll 1991,1984	Corporate social responsibility pyramid	Four areas make up a corporate social responsibility pyramid: legal, economic, ethical and philanthropic.	Economic performance Social Development	Socially responsible means that profitability and obedience to the law are foremost conditions when discussing the firm's ethics and the extent to which it supports the society in which it exists with contributions of money, time and talent
Freeman, 1984	Stakeholder Theory	The firm has to take into consideration the groups that can be affected or affect the firm with their actions.	Clients Suppliers Performance	All actions from external or internal groups of the firm can affect its performance and the achievement of its goals.
Porter, Goold & Luchs 1996.	Competitive advantage strategy	Generating a competitive advantage strategy creates a unique position for the firm.	Cost leadership Differentiation	The basis of above-average performance within an industry is sustainable competitive advantage", taking offensive or defensive actions to create a defensible position in an industry.
Barney J. 1991	The Resources-Based theory of competitive advantage.	Declares that the capacity of a firm to obtain better results that its competitors depends on the unique interaction of resources (human, organizational, and physical).	Tangible resources Intangibles resources	Resources that can lead to competitive advantages must have four characteristics: to be valuable, rare and difficult to imitate and replace by competitors; and the firm has to be organized in order to implement effectively these resources.
Hart 1995	A natural Resource-Based view of the firm.	Establishes that one of the most important drivers of new resource and capability development for firms lies in constraints and challenges by natural (biophysical) environment.	Tangible resources Intangible resources	Develops his conceptual framework with three such interconnected strategies: pollution prevention, product stewardship, and sustainable development. Hart considers as critical resources, continuous improvement, stakeholder integration and shared vision on RSE.

Source: Compilation based on different authors. This table shows the theoretical points of view, from which has been analyzed the relationship between economic performance and CSR in the last three decades

Freeman and Gibert (1988) state that when firms make decisions, they realize that there is another group or external individuals that have some interest in what the firm is doing. These stakeholders, employees, clients, providers and government make decisions as well, and depend on these organizations to achieve

their projects. This is a relationship based on mutual dependency. If one of the parts get damaged it could damage the other part.

In recent years, strategic management has explained the relationship between CSR and financial performance. The relation between competitive advantages strategies and financial performance (Porter & Kramer, 2006), occurs specifically in social and environmental programs. This coincides with the arguments of Reinhard and Stavins (2010) who establish that many firms sacrifice income to appear socially responsible. They invest in environmental programs, either voluntarily or with the purpose of avoiding a sanction from the institutions of the market. When this sacrifice is positive the commitment with CSR is more reliable giving advantages in the management of their products or services.

Competitive strategies based on natural resources have been applied. These strategies start from the firm's capacities to facilitate the activity of an environmentally sustainable economy, a vision based on natural resources (Hart 1995). The view of the firm based on natural resources, emanates from the existing connection between new environmental challenges, firm's capabilities and resources with pollution prevention strategies, product management and sustainable development.

Social Responsibility and Financial Performance Relationship

CSR literature has contributed with different concepts, results and procedures that can be analyzed (Margolis & Walsh, 2001). For about three decades, empirical evidence has been delivered, and theories have been proposed to explain the relation existing between social responsibility and financial performance (Orlitzky, 2006). Different kinds of results are found: positive, negative and combined (Frederick 1978, Griffin & Mahon 1997; Ullman 1985, McGuire Sundgren & Shneeweis, 1988, Carroll 1999, Jensen 2001, Orlitzky, Schmidt & Rynes 2003). Preston and O'Bannon (1993); and Waddock and Graves (1997) state the existence of results regarding the relation between CSR and financial performance. Negative results appeared when companies involved in social responsibility programs invest in modifications or acquisitions that could be executed for other stakeholders. By doing this, companies are incurring in competitive disadvantage. The positive association is the result of the low investment of the company in CSR programs and the benefits are bigger when are reflected in its reputation. Lastly, neutral results are influenced by the existence of several variables taking part that cannot explain the CSR and financial performance relation.

Preston and O'Bannon (1993), a causal sequence between CSR and financial performance. This sequence has been normally studied with CSR as the independent variable, but also as dependent variable. This suggests the relation is studied in both directions and different signs. Freeman (1984) refers the existence of a positive relation between CSR and financial performance, due to the company's ability to satisfy their stakeholders by the means of their environmental strategies and reduce their operating expenses. According to Porter and Kramer (2006), strategies based on philanthropy and ethics generate competitive advantages for the companies. They create prestige and social value. In 1995, Hart points out that strategies based on natural resources generate advantages for companies in expenses, brand, and prestige.

Empirical studies show an impact of social responsibility programs of the companies. For instance Russo and Fouts (1997) study 243 enterprises from all economy sectors. They discovered that environmental strategies, through reduction of consumption and innovation, is related positively with financial performance of the enterprise. The relation was also moderated through the enterprise's growth. Torugsa, O'Donohue, and Hecker, (2012) examined 171 Australian companies of the manufacturing sector. They found a positive relation between CSR and financial performance when adopting environmental strategies to create value for the enterprise. In the same mode, Christmann (2000) studied 88 companies finding that innovation capacities and implementation of environmental practices are determination factors for companies' financial performance. In a similar study with 470 enterprises in Germany, Gamerschlag,

Möller, and Verbeeten, (2011) concluded that these companies produce high financial performance when reporting the results of social responsibility programs implementation. The relationship between CSR and the enterprises financial performance in developing economies and the scarce empirical evidence regarding the relation between CSR and financial performance of enterprises in Mexico, motivate this study. We question why Mexican enterprises adopt environmental responsibility programs? Is there a relation between the adoption of environmental responsibility programs and the financial performance of goods and services Mexican enterprises participating in the PNAA?

DATA AND METHODOLOGY

The investigation explores character, quantitative, and longitudinal data. The information source was secondary data. The sample included 41 enterprises with environmental certification granted by PROFEPA in 2014. The data-gathering period took place in 2015, when PROFEPA published the report of certified firms in 2014. Table 2 shows the information sources: (1) Institutional Information System (SIIP). This system registers certified enterprises that have environmental quality according to PNAA managed by LA PROFEPA (2) list of the most successful enterprises in Mexico published by CNN Expansion magazine (Cable News Network México).

Table 2: Population, Sample and Source

Variable	Population	Sample	Source
Social Responsibility	23, 313 goods and services enterprises in Mexico.	Enterprises participating in the National Environmental Audit Program with environmental quality certification in 2014	SIEM (Corporate Information Mexican Systems) www.siem.gob.mx
Financial performance (Net profit + sales Wealth)		Ranking of 500 most successful enterprises in Mexico published in CNN Expansion Magazine in 2014	SIIP (Institutional Information System PROFEPA) http://www.profepa.gob.mx/
Enterprise size (number of employees)			Ranking of 500 most successful enterprises CNN EXPANSION http://www.cnnexpansion.com/rankings/2015/las-500-empresas-mas-importantes-de-mexico-de-expansion-2015

This table shows the study variables, the firms in Mexico, the characteristic of the sample and the source where the investigation data was published.

Sample

SIIP reports 1,145 certified enterprises in the National Environmental Audit Program of which 663 enterprises are certified as clean industry, 368 enterprises have environmental quality certification and 144 enterprises are certified with environmental quality tourism. As a sample for this study data of 368 goods and services enterprises with environmental quality certification was collected. CNN Expansion magazine informed net profit, gross sales, wealth, assets, capital calls and employees number as economic indicators of 500 enterprises, which were filtered by sector. For this study 254 goods and services enterprises were reviewed. Sampling information from two databases was coordinated (SIIP – CNN Expansion) to filter information of 368 enterprises with environmental quality certification and 254 enterprises in the list of the most successful enterprises in Mexico. By doing this, a total consisting of 41 companies with environmental quality certification and financial performance report from the ranking list of the most successful enterprises in Mexico publish annually by the CNN Expansion magazine was obtained.

The literature examines social responsibility using different measures about corporate social responsibility. These measures have been determined from the reports of different programs such as: TRI, EIRIS, and financial reports such as: FORBES and stock exchange. In this investigation PNAA measurements are determined by the means of PROFEPA environmental quality certification label. The indicators are: The technical aspects covering environmental auditing are classified in two categories: I. Aspects covered by

Mexican Environmental Norms NMX-AA-162-SCFI-2012 and NMX-AA-163-SCFI-2012 and General Law on Ecological Balance and the Regulation to the Environmental Protection in The Field of Self-Regulation and Environmental Auditing. II. Aspects unregulated environmentally with indexes: risk, safety, emergency care, training, international norms and standards, good engineering practice and energy consumption optimization. Enterprises fulfilling these two technical aspects of environmental auditing (I y II) are deserving of environmental certifications of the PNAA managed by PROFEPA. The type of certification depends on the economic sector the enterprises belong to; manufacturing and transformation enterprises obtain Clean Industry certification, tourism enterprises such as, hotels, restaurants, bars and entertainment places with tourist purposes are worthy of Environmental Quality Tourism, and finally goods and services enterprises, for instance, banks, self-service stores, department stores, pharmaceuticals are worthy of environmental quality certification.

Financial Performance

According Orlitzky (2003) financial performance involves obtaining expected economic benefits from enterprises activities as a result of financial viability or as achievement of economical aims. To attain the list of the most successful companies in Mexico, CNN Expansion magazine applied more than 2,000 surveys to capture enterprises corporative information, such as, financial background, enterprise size, net sales and ordered this information as a report consisting of the ranking of 500 most successful enterprises in Mexico. For the purpose of this study, financial performance was measured with annual sales information, profits and assets of the 41 companies with environmental quality certification from PNAA managed by PROFEPA reported in CNN Expansion list. The measurements taken into consideration were:

Net income: The consolidated net income of the company's operation. Net income corresponding to minority business enterprises is included (expressed in million Mexican pesos).

Corporate assets: are compounded as the audited assets of the company. Therefore, financial performance = annual sales + profits + assets of company

Company size: In the literature about CSR, company size has been analyzed as a control variable, moderating variable or intervening variable causing some sort of effect in the relation between CSR and financial performance (Orlitzky 2006; Margolis and Walsh, 2007). Company size is measured with the employment indicator, reported in CNN Expansion magazine list. Employment is the number of company employees, as a result of the addition of employees hire directly for the company, and the employees hired by a services provider company.

RESULTS

A binary logistic regression analysis of the CNN Expansion magazine list was made. Some 254 goods and services companies were taken into account. Labeling as follows: 1 = companies with environmental quality certification and 0= companies without environmental quality certification Making the logistic regression model the H_0 is rejected in terms of probability of the occurrence, by the means of Chi-Square Test. H_0 is rejected if $\beta_0 = \beta_n = 0$. In this way, Table 3 displays omnibus tests of the coefficient of the set out model ($\beta \neq 0$ $\beta_n \neq 0$) is found with a level of $P \leq 0.05$. Variables are associated each other. Corporate social responsibility is related significantly with financial performance, this answers the question set out in this investigation that establish a relation between CSR and financial performance.

To evaluate the goodness of fit of this logistic regression model, the indicators displayed in Table 4 were observed for the coefficients of R Square Cox and Snell and Nagelkerke. Table 4 shows that the

Nagelkerke R-Square coefficient explains 18.3% of data variability collected about the number of certified and uncertified companies.

Table 3: The Omnibus Tests of Model Coefficients

		Chi-Square	Gl	Sig.
Step 1	Step	24.931	1	0.000
	Block	24.931	1	0.000
	Model	24.931**	1	0.000
Step 2	Step	3.102	1	0.078
	Block	28.033	2	0.000
	Model	28.033**	2	0.000

This table displays Chi-Square test of model. Significance of $**p \leq 0.001$, shows that variable CSR is significantly linked with financial performance.

According to Aldás (2011) the best fitting indicator of a logistic regression is its capacity to separate the groups based on estimated probabilities. For this reason, classification matrix is evaluated using Hosmer and Lemeshow test (Table 5). Table 5: Displays the Goodness of Fit Using Hosmer and Lemeshow Test, Where $P < .05$ This Indicates a Best Fit Model

Table 4: Model Summary of the CSR and Financial Performance

Step	Logarithm of the Likelihood -2	Cox and Snell R Square	Nagelkerke R Square
1	189.458 ^a	0.093	0.164
2	186.356 ^a	0.104	0.183

This table shows results of R Square, where the variability percentage of the collected data from the certified firms is explained.

Table 5: Hosmer and Lemeshow Test

Step	Chi-Square	Gl	Sig.
1	8.645	8	0.373

This table explains data variability between certified and uncertified firms, in order to prove the fitting of the model that indicates an optimal data adjustment.

From the classification matrix displayed in Table 6, the analysis process reports 85% of companies completely classified. Therefore, the probability with this logistic function is 85%. This indicates the probability that financial performance is related with companies' certification. In step 1 of the 254 companies observed, we find 212 companies are classified as uncertified and 4 companies have behavior of certified companies. Meanwhile 32 of 38 certified companies present behavior of uncertified companies and only 6 companies are classified as certified. In step 2 from 254 observed companies, 209 companies are classified as uncertified and 7 companies have behavior of certified companies. Some 31 of 39 certified companies have behavior of uncertified companies and only 7 companies are classified as certified companies.

Table 6: Classification Matrix

		Observed		Expected		Percentage Correct
		Certified	Uncertified	Uncertified	Certified	
Step 1	Certified		Uncertified	212	4	98.1
	Uncertified	Certified		32	6	15.8
	Overall Percentage					85.8
Step 2	Certified		Uncertified	209	7	96.8
	Uncertified	Certified		31	7	18.4
	Overall Percentage					85.0

a. Cut value is .500

This table displays the classification matrix of the analyzed firms

To make an interpretation of the model displayed in Table 5, coefficients have to be evaluated, which are used to calculate odds or ratio between probability of occurrence and non-occurrence of the event. For this purpose, Table 7 shows (equation variables) the second evaluation.

Table 7: Variables in the Equation

		B	Standard Deviation	Wald	Gl	Sig.	Exp(B)	95% C.I. For EXP(B)	
								Lower	Upper
Step 1 ^a	Performance	0.000	0.000	17.440	1	0.000	1.000	1.000	1.000
	Constant	-2.307	0.238	93.799	1	0.000	0.100		
Step 2 ^b	Performance	0.000	0.000	18.499	1	0.000	1.000	1.000	1.000
	by Employment			3.814	1	0.051	1.000	1.000	1.000
	Constant	-2.432	0.252	92.840	1	0.000	0.088		

*This table illustrates the equation of the model with the interaction of firm's size variable. Variables specified in step 1: Performance. b. Variables specified in step 2: Performance * Employment.*

$$P(\text{state} = \text{certified}) = \frac{1}{1 + \exp(-2.652 - 0.000(\text{performance}))} \tag{1}$$

In the same way, the model shows that in the performance-employment interaction, employment (company size) has significant influence in the model.

Variables in the equation

$$Y = \beta - 2.432 X1 * X2 \tag{2}$$

Where

Y= Corporate Social Responsibility (Certified company)

X1= Financial performance

X2= Company size

DISCUSSION AND CONCLUSIONS

This investigation analyzes the link between corporate social responsibility and financial performance of firms belonging to the goods and services sector in Mexico, with the purpose of understanding how the voluntary programs of social responsibility modify the financial performance of the firms. The results show a relationship between CSR and financial performance of goods and services Mexican companies. However, in the context of Mexican companies, corporate social responsibility has a correlation with financial performance. This situation is explained in terms of funds availability. That is, when a company wishes to implement environmental programs, philanthropic or ethical, the adoption of these programs depends on the availability of the economic resources of the company. These results concur with the hypothesis stated by Preston and O'Bannon (1993), which suggests that upper (lower) levels of financial performance lead to upper (lower) levels of CSR. Even when the company desires to adopt measurements and follow the behavior rules, doing so depends on resources availability.

In this economic sense, the requirements for the certification, the PNAA establishes that the company must hire an external auditor, certified by the Mexican Accreditation Entity (EMA), which supervises the established procedures to achieve the certification. In the certification process, companies invest in adopting measures imposed in environmental law to reduce its consumption. These measures go from installation of saving light-bulbs to the acquisition of new technologies. The investment that companies in PNAA make depends on the size of the company and the sector it belongs. Implementation expenses in

goods and services economic sector are minor in comparison with expenses of the industrial economic sector. For the industrial economic sector, guidelines are stricter and implementing new technologies requires a major investment. To achieve PROFEPA environmental certification, companies have to pass the environmentally regulated and unregulated technical aspects, which represents a reduction of energy and water consumption. Therefore, by optimizing energy consumption there are savings for the company.

The conclusions of this study lay the foundations to make recommendations to institutions promoting CSR programs. The goal is to avoid emphasizing only on environmental benefits of adopting a social responsibility program. We also hope entrepreneurs get to know the economic benefits reflected by the consumption reduction and other benefits coming of the certification. In this way, the fear of businessmen of risking their capital in the process could be diminished. The importance of business responsibility must not lay exclusively with governmental institutions and their certification processes. It is necessary to analyze firms from all sectors. The responsibility level is not the same in the goods and services sector compared with other economic sectors. Further research is recommended to analyze the financial performance and social responsibility of firms from all economic sectors with certifications, and evaluate if there is a variation in the results. This study is only one of the three economic sectors of firms in Mexico. Finally, it would be interesting to explore some variables that could moderate the relationship between financial performance and CSR in Mexican firms.

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THE EFFECT OF “ EL BUEN FIN ” IN MEXICAN HOTEL OCCUPANCY

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ABSTRACT

The aim of this article was to analyze the effect of 'El Buen Fin', Mexico's sale weekend, in Mexican hotels occupancy. Indices of such were analyzed by national tourists in central Mexican cities on weekly bases during 2003 thru 2014. A multiple regression model was used with three predictive variables namely: the passing of time, holidays and El Buen Fin, where the response variable was the number of weekly occupied hotel rooms by Mexican tourists. Implementation of El Buen Fin had an impact in the occupancy of five of the six cities subject of study: Colima, Guanajuato, Pachuca, Guadalajara and Toluca. Regarding to the beach towns of Acapulco, Ixtapa-Zihuatanejo, Puerto Vallarta and Nuevo Vallarta, El Buen Fin showed no statistical significant effect in any of them.

JEL: Z3

KEYWORDS: Hotel Occupancy, Mexico, el *Buen Fin*, Economy, Tourism

INTRODUCTION

Most tourist destinations face a high degree of uncertainty in lodging demand because of uncontrollable external causes (De Rus and León, 1997), one of such is the "Mexican Black Friday", better known as *El Buen Fin*. In its begging *El Buen Fin* had an opposite reaction from the hotel industry. The president of the "Confederación Nacional Turística" (Mexico's National Tourism Confederation) and the Secretary of "Asociación Mexicana de Hoteles" (Hotel Association of Mexico) labeled as negative for the hotel industry doing *El Buen Fin* in one of the three extended weekends. Their belief had its support in the argument that customer would assigned their expenses to buy electronic instead of spending their money traveling. (Visor on line, 2011). This article focuses on analyzing the effect of *El Buen Fin* on the hotel room's occupancy by Mexican tourists. It is make up as follows: the literature review section mentioned researches that have studied the effect of some events in hotel occupancy, the origin and concept of *El Buen Fin* it is also mentioned in this same section. The second section describes the methodology used and introduces the model that served as a basis for data analysis. The third section refers to the obtained results. Finally the fourth and last section presents the concluding comments.

LITERATURE REVIEW

Organizations involve in lodging face variants in their occupancy rate that depend on weather (Chen and Lin, 2014), sports events (Pita, 2013), currency exchange rate (Corgel, Lane and Walls, 2013), terrorism (Domínguez, Burguete and Bernard, 2003; Cabrer and Pérez, 2007; Corgel et al. 2013), financial crisis (Bijouy, 2014; Alonso and Bremser, 2013; Sztruten, Dridea and Murgoci, 2011; Song, Shanshan, Witt and Zhang, 2011; Laksmi and Ramachandran, 2015) diseases (Speakman and Sharpley, 2012;

Speakman, 2014) and the current school calendar (Instituto de Análisis Económico y Empresarial de Andalucía, 2010). “Secretaría de Turismo de México” (Mexico’s Secretariat of Tourism, SECTUR, 2015) defines the number of occupied rooms in Mexican hotels as the total registry of hotel rooms or units occupied by national and foreign tourists in a reference period in the country. The arrival of foreign tourists and hotel occupancy are indicators often used in academic literature to perform analysis on the effects that certain variables can have over the organizations dedicated to accommodation (Bijouy, 2014; Alonso and Bremser, 2013; Sztruten, Dridea and Murgoci, 2011; Domínguez, Burguete and Bernard, 2003). However, the effect that certain events or commercial programs have had over hotel occupancy in Mexico hasn't been explored yet.

In Mexico, one of the incentives for hotel owners are the “extended weekends” caused by the succession of nonworking days (some nonworking days that fall in weekdays are moved to the previous Friday or the next Monday). In 2006, an amendment to Article 74 of Mexico's Federal Labor Act was made (Presidencia de la República, 2006) settling three compulsory days off. So, the first Monday of February, the third one of March and the third of November were permanently set as dates to commemorate the enactment of Mexico's Constitution (February 5th), the birthdate of Benito Juárez, a former Mexican president and national hero (March 21st) and the beginning of Mexican Revolution War (November 20th), respectively. These days were established as compulsory holidays to promote family quality time and activate domestic tourism.

In 2011, Mexican federal government launched *El Buen Fin* nationwide as a way to reactivate the economy after going through the 2009 recession; since then, *El Buen Fin* is carried out every year, mimicking the *Black Friday* in the U.S; it is carried out the weekend of the Mexican Revolution anniversary commemoration and lasts four days. In the U.S., *Black Friday* is considered a consumer spending ritual that even must be meticulously planned the day before (even if the shopping is online) (Boyd & Peters, 2011). There's still no evidence in Mexico that this encouragement to buy bargains in specific day has changed in way that *El Buen Fin* can be considered a ritual. Nevertheless, *El Buen Fin* has had results on online shopping. In 2012, statistics about *El Buen Fin* showed a high spending rate on material commodities, such as television screens, and plane tickets or midterm vacation packages (pay today, travel tomorrow), augmenting online shopping in a 65% (Asociación Mexicana de Internet, 2012). Some authors (Keen et al. ,2004 ; Goldsmith and Flynn , 2005) coincide saying that online shopping does not replace direct shopping in stores despite the great increase that online shopping has had in the last few years because of the convenience the customers have to select among different items or services without leaving their homes or offices (Asociación Mexicana de Internet , 2012; Kim and Kim, 2006) It has been proven that shopping is popular between tourists. A significant number of Mexican citizens that live near the U.S. border travel to American cities to go shopping (Bojanic, 2011), but Mexico also has its own 600 shopping malls (FORBES, 2015). In considering the largest number of inhabitants are in the central part of this country (INEGI, 2015) it is only logical to think the people who lives there shop in domestic stores of Mexico. To corroborate that people do transit during *El Buen Fin* to benefit from the bargains, the next research question was made: What is the effect of The *El Buen Fin* program in hotel occupancy in the center of Mexico? To answer such question, the following methodology was used.

DATA AND METHODOLOGY

Since more than 80% of tourists that visit Mexico are national tourists (INEGI, 2014), this study focuses on analyzing the effect of *El Buen Fin* on hotel occupancy, ignoring hotel category or classification, by national tourist (Mexican tourists) in cities of the center of Mexico in a 12-year period. To define the states that are located in central Mexico, the classification of Mexico's Secretariat of Tourism was chose, thus 16 states were the original sample. Of those, the ones whose information was incomplete for the study span were excluded, narrowing the sample to only eight states: Colima, Guanajuato, Hidalgo, Jalisco, Estado de México, Querétaro, Guerrero and Nayarit. From those eight states, six capital inland

cities were randomly selected (Colima, Guanajuato, Pachuca, Guadalajara, Toluca and Querétaro) and four beach towns (Acapulco, Ixtapa-Zihuatanejo, Puerto Vallarta and Nuevo Vallarta).

Demographic data was retrieved (e.g. the size and the category of the hotels located in each of the cities in the sample) to explore the general features of the establishments that offer accommodation. The data were distributed in two tables: Table 1 shows the total number of hotels located in each city, as well as the matching category regarding their size according to the rate of *Sistema de Información Empresarial Mexicano* (SIEM, Mexico's entrepreneurial information system, 1999), Table 2 shows hotel groups in each city according to category and star rating they hold.

Table1: Types of Establishments Grouped by Number of Employees

		Establishment According to Number of Employees				Total
		≤ 20 Micro	21 to 50 Small	51 to 100 Medium	> 100 Large	
Beach City	Colima	34	4	3	0	41
	Guanajuato	83	11	3	3	100
	Pachuca	29	0	0	0	29
	Guadalajara	220	38	13	12	283
	Toluca	53	5	0	0	58
	Querétaro	59	14	5	0	78
Inner Town	Acapulco	362	20	10	21	413
	Ixtapa-Zihuatanejo	209	8	4	10	231
	Puerto Vallarta	118	19	0	0	137
	Nuevo Vallarta	108	3	0	15	126
	Total	1275	122	38	61	1,496

Table 1 shows hotel segmentation in each destination according to the number of employees, as states the "Sistema de Información Empresarial Mexicano" (SIEM,1999) ranking. Source: Prepared by authors from the definitive findings of "Censo Económico 2009", recovered from INEGI (Mexico's National Institute for Statistics and Geography) (2010).

As it is shown in Table 1, 93% of the sample are micro, small and only 7% are medium and large hotels; it's surprising the fact that Pachuca, Toluca and Puerto Vallarta only have micro and small hotels. As for beach towns, it can be seen that the total number of hotels goes from 126 to 413, while the inland destinations go from 29 to 283. It is clear the highest average of hotels are in beach destinations.

It's easy to note that uncategorized hotels are the most in the study; In general, it is also noticed that three-star hotels are the most common among those who are categorized. Meanwhile, the four and five-star hotels exceeds one and two-star hotels in number. It is noteworthy the number of hotels in table 2 differs from the total number in table 1, because of correspondence for available sources in different years. Once the demographic features of the hotels were explored, its occupancy was analyzed. Data were collected between December 2015 and March 2016. Occupied hotel rooms records (without distinction of category) by national tourists in the aforementioned cities during the time period from December 30th, 2002 to December 28th, 2014 were obtained from the Datatur website. This period included 626 weeks for each of the ten studied cities. A multiple regression model was used with three predictive variables. The response variable was the number of hotel rooms weekly occupied by national tourists, there were three predictive variables: the first one of a temporal kind and the remaining two variables were of the Dummy (fictional) kind. The model is described below.

$$\text{Multiple regression model: } y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 \quad (1)$$

Where:

y = number of occupied hotel rooms per week by national tourists

x_1 = number of consecutive weeks (Time variable)

$x_2 = \{x_2 / x_2 = 1 \text{ if it is an extended weekend, } x_2 = 0 \text{ if it is not } \}$ (First Dummy variable)

$x_3 = \{x_3 / x_3 = 1 \text{ if it is El Buen Fin, } x_3 = 0 \text{ if it is not } \}$ (Second Dummy variable)

Table 2: Hotel Classification by Ranking

		Hotel Classification by Star Ranking						
		5 *	4 *	3 *	2 *	1 *	Uncategorized	Total
Beach City	Colima	3	7	5	3	11	8	37
	Guanajuato	21	17	32	24	10	29	133
	Pachuca	4	4	17	5	0	3	33
	Guadalajara	23	43	43	12	37	60	218
	Toluca	3	14	3	0	4	31	55
	Querétaro	38	33	19	10	9	24	133
Inland Town	Acapulco	28	45	87	81	34	NA	275
	Ixtapa-Zihuatanejo	26	24	46	32	21	71	220
	Puerto Vallarta	26	34	28	12	13	171	284
	Nuevo Vallarta	32	6	18	10	5	130	201
		204	227	298	189	144	527	1589

Table 2 shows the hotel segmentation by destination according to its ranking. Source: Source: Prepared by authors from data in Datur (2014).

The variable x_1 was represented with a series of consecutive values from 1 to 626 matching to each one of the weeks. The variable x_2 took the value of 1 in those weeks that a holiday came to happen and 0 when that wasn't the case. The variable x_3 took the value of 1 in those weeks that *El Buen Fin* came to happen and 0 when that wasn't the case. In order to assign the respective values to the dummy variable x_2 , the Secretaría de Educación Pública's (Mexico's Public Education Secretariat) calendars were thoroughly reviewed from 2002 to 2015, to find that in this period there were 37 holidays. For the second dummy variable x_3 the *El Buen Fin* official website showed the happening of this event in four times over the reference period. With those variables, a first regression was made to identify the statistical significance of the same, taking as response variable the room occupancy by national tourists in the cities of Colima, Guanajuato, Acapulco, Ixtapa-Zihuatanejo, Pachuca, Guadalajara, Puerto Vallarta, Toluca, Nuevo Vallarta and Querétaro. The significance for the variables was set at $\alpha = 0.05$. Once the significant variables were set, a second regression was made for each city. The second regression held as predictable variables only those who came out statistically significant in the first regression. Both, the results from the first and the second regression, are shown in the results section.

RESULTS

A regression with hotel rooms occupancy by national tourists between 2003 and 2014 was made, holding as a predictive variable the following week (temporal variable), the extended weekends (first dummy variable) and *EL Buen Fin* (second dummy variable). To make the analysis easier, cities were grouped in inland cities and beach towns, and the results are shown in Table 3.

Table 3: Multiple Linear Regression

A = 0.05		P-Global	R ² Ajust	P-Constant	P-Week	P-Extended Weekend	P-Buen Fin
Beach City	Colima	0.0000	5%	0.0000	0.0830	0.4030	0.0000**
	Guanajuato	0.0000	21.6%	0.0000	0.0000**	0.5640	0.0000**
	Pachuca	0.0000	65.2%	0.0000	0.0000**	0.6760	0.0000**
	Guadalajara	0.0000	43.1%	0.0000	0.0000**	0.0000**	0.0030**
	Toluca	0.0000	37.9%	0.0000	0.0000**	0.6790	0.0000**
	Querétaro	0.0000	66.9%	0.0000	0.0000**	0.8600	0.2090
Inland Town	Acapulco	0.0000	2.5%	0.0000	0.0000**	0.9000	0.0940
	Ixtapa-Zihuatanejo	0.0000	2.8%	0.0000	0.0000**	0.0110**	0.0570
	Puerto Vallarta	0.0000	13.7%	0.0000	0.0000**	0.0030**	0.0590
	Nuevo Vallarta	0.0000	38.4%	0.0000	0.0000**	0.0000**	0.6920

Table 3 shows the results of the multiple linear regression for occupancy in hotel rooms by national tourists between 2003 and 2014. *Significant at 5% Source: Prepared by authors.

Table 3, shows p-values of the regression that express a significant value lesser than $\alpha = 0.05$. The temporal variable (P-week) is remarkable as being significant in every case except for Colima, meaning the passing of time explains in an important way a part of the hotel occupancy in every city except Colima. The effect of extended weekends (P-extended weekend) came out significant in 3 of 4 beach towns: Ixtapa-Zihuatanejo, Puerto Vallarta and Nuevo Vallarta, and only one inland city: Guadalajara. For its part, the effect of *El Buen Fin* (P-Buen Fin) turned out significant in every inland city except Querétaro, and insignificant in every beach town. Regressions were made once again but variables that were insignificant for a certain city were omitted in order to obtain more accurate data about the model and the influence in it of the variables that turned out statistically significant. P-values and the values of the respective parameters are shown on table 4; omitted variables are shown on the table as NA.

Table 4: Multiple Linear Regression with Significant Variables

$\alpha = 0.05$		Constant		Week		Extended Weekend		Buen Fin			
	P-Global	R ² Ajust	P	β_0	P	β_1	P	β_2	P	β_3	
Beach City	Colima	0.0000	4.8%	0.0000	2,881	NA	NA	NA	0.0000**	1,427	
	Guanajuato	0.0000	21.7%	0.0000	4,270	0.0000**	5.773	NA	0.0000**	3,874	
	Pachuca	0.0000	65.2%	0.0000	2,406.8	0.0000**	6.423	NA	0.0000**	1,689.5	
	Guadalajara	0.0000	43.1%	0.0000	33,983.8	0.0000**	34.003	0.0000**	5937	0.0030**	11,151
	Toluca	0.0000	38.0%	0.0000	4,478.5	0.0000**	6.381	NA	NA	0.0000**	-3,511.2
	Querétaro	0.0000	66.9%	0.0000	10,493	0.0000**	18.237	NA	NA	NA	NA
Beach Town	Acapulco	0.0000	2.4%	0.0000	41,044	0.0000**	13.844	NA	NA	NA	NA
	Ixtapa-Zihuatanejo	0.0000	2.4%	0.0000	12,081	0.0010**	3.875	0.0130**	-2,160.1	NA	NA
	Puerto Vallarta	0.0000	13.4%	0.0000	17,604.9	0.0000**	19.093	0.0030**	-4,568	NA	NA
	Nuevo Vallarta	0.0000	38.4%	0.0000	5,388.6	0.0000**	21.788	0.0000**	-3,377.8	NA	NA

Table 4 shows the results of the multiple linear regression for hotel rooms occupancy by national tourists between 2003 and 2014 taking only significant variables as predictive. ** Significant at 5%. Source: Prepared by authors.

Table 4 shows the parameter β_3 , that explains the *El Buen Fin* variable, has an increase regarding the expected occupancy average in Colima, Guanajuato, Pachuca and Guadalajara but not so for Toluca, where a decrease in 3,511 hotel rooms is shown. In the same table, with regard to the expected average of occupied rooms, Parameter β_2 (the one that explains the extended weekend variable), shows an increase in Guadalajara; but in beach towns such as Ixtapa-Zihuatanejo, Puerto Vallarta and Nuevo Vallarta, shows a decrease. Parameter β_1 shows the expected increase in occupancy corresponding to the weekly course, being statistically significant in all cities of the sample except Colima. Finally, the parameter β_0 stands out

for Querétaro, Guadalajara, Acapulco and Puerto Vallarta and explains for a high occupancy rate expected in a normal week, that is without an extended weekend, *El Buen Fin* or considering the passing of time.

CONCLUDING COMMENTS

Under the assumption that Mexicans living in the center of their country travel to that same area to shop in days meant for it (e.g. *El Buen Fin*), the objective of this article was to analyze the effect that *El Buen Fin* had in the hotel rooms occupancy by national tourists. To achieve that, records were obtained from the number of occupied hotel rooms by national tourist for 626 weeks in 10 cities in the central Mexico, this data was used as a response variable in a multiple lineal regression model that had three predictive variables: the passing of time, extended weekends and *El Buen Fin*. From the six inland cities that were analyzed, Colima, Guanajuato, Pachuca, Guadalajara, Toluca and Querétaro, only for the latter, *El Buen Fin* had no statistical significant effect. In Colima, Guanajuato, Pachuca and Guadalajara an increase was noticed on the expected hotel occupancy rooms; for Toluca, there was a decrease. As for beach towns, Acapulco, Ixtapa-Zihuatanejo, Puerto Vallarta and Nuevo Vallarta, *El Buen Fin* showed no significant effect. The results of the model can be interpreted as described below.

For Ixtapa-Zihuatanejo, Puerto Vallarta and Nuevo Vallarta, extended weekends were significant. They showed a decrease with regard to the expected average value of this occupancy. This decrease should not be taken as negative, it simply suggests there are other higher occupancy dates than this one for instance, summer vacations or Easter. On one side Pachuca shows a R^2 of 65.2% and on the other side the expected average value of the occupancy increase for 1,700 hotel rooms in *El Buen Fin*. It would be good to think in tourism strategies that allow the city seize this occupancy increase with complementary activities that activate local economy. The model has limitations, as it is noted in the results. The study of certain cities as Colima, Toluca, Querétaro, Acapulco and Guanajuato need to be considered with other analysis models or include other variables in the current model. For Colima it is required further research to explain why hotel occupancy doesn't consider the time variable, it is recommended to explore with new variables that explain this unconventional behavior. For Toluca was noticed a decrease in average occupancy because of *El Buen Fin*; however, it is yet to find out if it is a relative decrease or if *El Buen Fin* inhibits hotel occupancy. Even though Querétaro has one of the largest shopping malls in the country, the *El Buen Fin* variable wasn't significant to this city; nevertheless, the expected increase on the passing of time explains in nearly 70% the occupancy behavior, perhaps this is caused by the industrial growth and business tourism. Just like Querétaro, Acapulco showed no change with regard to the extended weekends nor *El Buen Fin* and the time variable only explains 2.4% of the occupancy behavior.

Guanajuato, although it doesn't have large shopping malls, showed responsiveness to *El Buen Fin* and the temporal increase; however, the model can only explain occupancy in 22%. One the biggest events in this city and wasn't considered in the study is the "Festival Internacional Cervantino" which weights in hotel occupancy in the city; it is recommended to consider this for futures studies as a predictive variable. For its part, hotel occupancy in Guadalajara, whose shopping malls are emblematic nationwide, was the only regression in which all variables were statistical significant: occupied rooms growth through time, extended holidays and *El Buen Fin*; however, these variables only explain occupancy in 43%, which may give clues on a diversified demand. As it was proven, the effect of *El Buen Fin* in hotel occupancy proved profitable for some cities that are somehow related with important shopping malls in the country. This should encourage promotion of destinations such as Guanajuato, Colima, Guadalajara and Pachuca during the *El Buen Fin* weekend. Finally, we encourage to continue this research in two ways: the first, to study the motivation for the traveling and expense for those tourists that occupy hotel rooms during *El Buen Fin* and second to study hotel occupancy in other towns, such as the so-called "*Pueblos Mágicos*" or cities declared as World Heritage Site, including other explanatory variable such as: consumer price index

(CPI), inflation, currency exchange rate and remittances, regional celebrations or festivals and the consumer report of department stores during *El Buen Fin*.

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THE PERFORMANCE OF COMPETITIVE AND LOTTERY INCENTIVE SCHEMES VIS-À-VIS FIXED FEE INCENTIVE SCHEMES IN IMPROVING CONJOINT ANALYSIS

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ABSTRACT

Paying a fixed amount of money to participants in choice-based conjoint (CBC) studies is the industry standard. Recently, Ding (2007) has shown that a lottery incentive scheme outperformed a fixed fee incentive scheme when predicting out-of-sample choices. We achieve two research goals in the current paper to extend our understanding of incentive schemes in the context of CBC studies. One, we investigate if a higher fixed-fee (e.g. \$50 instead of \$10) helps improve out-of-sample predictions. Two, the lottery incentive scheme does not induce competition among CBC study participants. Therefore, we investigate the theoretical properties and empirical effectiveness of competitive incentive schemes relative to lottery and fixed incentive schemes. Our key findings with respect to hit rates for out-of-sample predictions are: (a) offering higher amounts of money is ineffective, and (b) competitive incentive schemes outperform the lottery incentive scheme (Hit Rates of 41 % and 62% for the 2 proposed competitive schemes vs. 29% for the lottery incentive scheme).

JEL: M310, C910

KEYWORDS: Conjoint Analysis, Incentive Schemes, Experiments, HB Estimation, Multinomial Logit

INTRODUCTION

Choice-based conjoint (hereafter referred to as CBC) is one of the main quantitative market research techniques used by firms to identify promising new product designs, segment markets, decide prices, etc. In a typical CBC study, consumers answer several choice questions. Each choice question shows several potential product designs and they choose the design that they would purchase if they had to buy one at that point in time. Estimation of a consumer's utility function then takes place using the answers to these choice questions, which then serves as an input to decisions regarding segmentation, pricing, identifying promising product designs, etc. Following the literature in conjoint analysis, we will henceforth refer to utility function estimates as partworths.

Choice-based conjoint (hereafter referred to as CBC) is one of the main quantitative market research techniques used by firms to identify promising new product designs, segment markets, decide prices, etc. In a typical CBC study, consumers answer several choice questions. Each choice question shows several potential product designs and they choose the design that they would purchase if they had to buy one at that point in time. Estimation of a consumer's utility function then takes place using the answers to these choice questions, which then serves as an input to decisions regarding segmentation, pricing, identifying promising product designs, etc. Following the literature in conjoint analysis, we will henceforth refer to utility function estimates as partworths. Offering a fixed amount of money (hereafter referred to as the Flat-Fee Scheme) to compensate consumers for the time and effort it takes to answer choice questions is the typical incentive scheme used in CBC studies. Recently, Ding (2007) (henceforth referred to as the

Ding study) investigated the impact of a lottery incentive scheme (hereafter referred to as the Product Incentive Scheme) on partworth recovery in a CBC study involving the design of an iPod package. The product incentive scheme is a lottery incentive scheme, as one randomly selected participant receives additional compensation. The structure of the additional compensation is such that study respondents are motivated to answer choice questions truthfully. In light of the above, it is not surprising that the product incentive scheme is very effective in improving partworth recovery. Specifically, the iPod experiment in the Ding study showed that hit rates for the holdout task improved from 17% for the flat-fee incentive scheme to 36% for the product incentive scheme.

Answering choice questions consistently and truthfully for the entire duration of a CBC study requires effort. In the Ding study, study participants received \$10, which is a relatively low level of compensation. A natural question that springs to mind is: Do sufficiently powerful flat-fee incentive schemes motivate consumers to exert effort and answer CBC questions accurately? For example, will study participants answer choice questions consistent with their true preferences if they received \$50 instead of \$10? Utility maximization would predict that flat-fee compensation schemes would not work irrespective of the amount of fee paid to respondents. However, there is considerable research in experimental economics that indicates that consumers often take decisions motivated by a sense of fairness, justice, etc. and do not always follow the principle of utility maximization. For example, consider the stream of research involving the ultimatum game. In the ultimatum game, two players need to split a certain amount of money as follows. Player 1 decides what percentage of the available money should go to player 2. Player 2 then decides whether to reject or accept player 1's proposal. If player 2 rejects the proposal, then neither player gets anything. On other hand, if player 2 accepts the proposal then the money is divided as proposed by player 1. Economic theory predicts that player 1 should offer the least amount of money to player 2 (say one cent) and player 2 should accept the proposal as that is better than receiving nothing. However, a meta-analysis of 75 ultimatum game experiments indicated that the player 1's average proposal was to offer 40% of the pie and that 16% of the offers are rejected (Oosterbeek, Sloof, and Kuilen 2004). 'A sense of fairness' in players is one reason that is commonly offered for the above deviation from the predictions of economic theory. In other words, proposing players do not offer one cent as they believe that such an offer is not a fair division of the available money and players reject proposals that are too low as they consider it an unfair proposal. Along the same lines, intuition suggests that if consumers know that they will be paid \$50 the time and effort it takes to answer CBC questions accurately, then a sense of fairness may motivate them to answer CBC questions according to their true preferences. In light of the above, an understanding of how consumers respond to powerful flat-fee incentives in the context of CBC studies is important from a theoretical perspective. Therefore, our first research goal is to investigate the effectiveness of a Strong Flat-Fee Incentive scheme (e.g. \$50) vis-a-vis a Weak Flat-Fee Incentive scheme (e.g. \$15).

The product incentive scheme offers one approach to motivate consumers to exert the required effort to answer choice questions truthfully. An alternative way to motivate consumers to exert effort is to induce competition among them, such that exerting effort increases the chances that they win an attractive prize. Therefore, our second research goal is to investigate the theoretical properties and empirical effectiveness of incentive schemes that induce competition among study participants in a CBC study. Specifically, we focus on two incentive schemes: the award incentive scheme and the hybrid incentive scheme. In the award incentive scheme, respondents answer a certain number of choice questions (e.g. 24). These choice questions are divided into two sets: an estimation set (e.g. 16 questions chosen at random) and a prediction set (e.g. the remaining eight questions). Estimation of a respondent's partworths are done using the answers to the estimation set and these estimated partworths are used to predict their choices to the choice questions in the prediction set. The respondent whose choices in the prediction set we are able to predict the best wins a cash award. In contrast to the product incentive scheme, the award incentive scheme is a competitive scheme as the structure of the scheme induces competition among the study participants. In the hybrid incentive scheme, we incorporate features of both the product incentive scheme

and the award incentive scheme. In other words, the scheme is such that study participants are motivated to answer choice questions truthfully and the reward they obtain at the end of the study is contingent on the extent to which other study participants provide consistent answers. In order to understand the theoretical properties of the award incentive scheme and the hybrid incentive scheme we model the strategic behavior of participants using game theory and characterize the Bayesian Nash Equilibrium of the resulting game. Using digital cameras as a context, we conducted five between-subject experiments in order to evaluate the empirical effectiveness of the five incentive schemes (i.e. the Strong Flat-Fee, the Product Incentive, the Award Incentive, the Hybrid Incentive, and the Weak Flat-Fee). In each experiment, participants answered 24 choice questions and subsequently answered a holdout choice question. Each choice question showed four alternatives (three digital cameras and a 'None of these'), whereas the holdout showed 17 alternatives (sixteen digital cameras and a 'None of these'). We assessed the relative effectiveness of the five incentive schemes by computing hit rates for the holdout task using partworth estimates from the answers to the 24 choice questions. Our theoretical and empirical findings are below.

From a theoretical perspective, truth-telling is not the only Bayesian Nash Equilibrium for the award incentive. Any strategy that requires study participants to be consistent with an arbitrary preference structure is an equilibrium strategy. Truth-telling is the only Bayesian Nash Equilibrium for the hybrid incentive scheme. From an empirical perspective we find that: 1.) The Strong Flat-Fee Scheme does *not* outperform the Weak Flat-Fee Scheme, 2.) The Product Incentive Scheme outperforms the Weak Flat-Fee Scheme by a 2 to 1 margin (Hit Rates: 29% vs. 14%), 3.) The Award Incentive Scheme outperforms the Product Incentive Scheme by a 2 to 1 margin (Hit Rates: 62% vs. 29%), thus outperforming the Weak Flat-Fee by a 4 to 1 margin (Hit Rates: 62% vs. 14%), 4.) The Hybrid Incentive Scheme outperforms the Product Incentive Scheme by a 1.4 to 1 margin (Hit Rates: 41% vs. 29%), thus outperforming the Weak Flat-Fee by a 2.9 to 1 margin (Hit Rates: 41% vs. 14%).

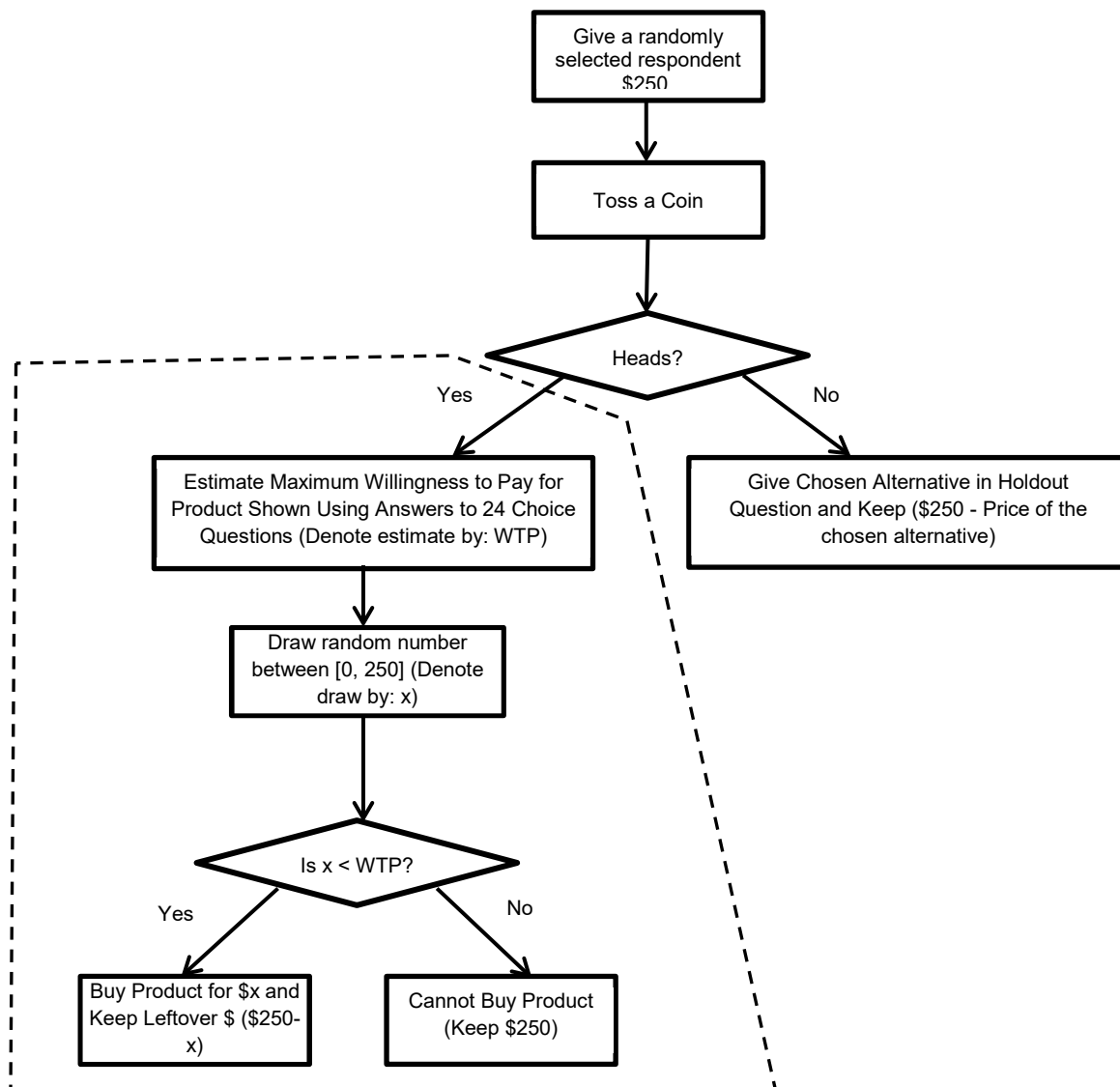
We make three observations about the above findings at this point and defer a detailed discussion of these findings to when we discuss our results. One, the presence of multiple equilibria, including truth-telling in the Award Incentive Scheme, is not surprising, as the Award Incentive Scheme has no mechanism to induce truth-telling. Consequently, we designed our experiment such that respondents did not have sufficient time or knowledge to resort to any other strategy except truth-telling. We elaborate on this issue in the data and methodology section. Two, since the Hybrid Incentive Scheme incorporates features of the Product Incentive Scheme, it is not surprising that truth-telling is the unique equilibrium. Three, the lack of superiority of the Strong Flat-Fee is somewhat surprising. Contrary to our intuition, but consistent with economic theory, there was no difference in accuracy to answers to CBC questions between respondents in the Strong Flat-Fee experiment and the Weak Flat-Fee experiment. The inferiority of the Strong Flat-Fee suggests that even sufficiently powerful fixed-fee schemes do not motivate respondents to answer CBC questions accurately. Four, our findings regarding the superior performance of competitive incentive schemes indicate that we must carefully design compensation schemes in order to motivate respondents to the maximum. The rest of the paper is organized as follows. In the next section, Literature Review, we examine the existing work that seeks to improve the quality of conjoint analysis via structuring incentive schemes that seek to encourage consumers to reveal their true preferences. Subsequently, in Data and Methodology, we discuss our experimental design, data collection and estimation procedures. In the Results section, we present the results of our estimation and discuss the implications of our findings. In the Concluding Remarks section, we summarize the main findings of our paper and discuss opportunities for future research that emerge from our work.

LITERATURE REVIEW

The Ding study investigated the effectiveness of the Product Incentive Scheme in the context of the design of an iPod package, which consisted of an iPod shuffle with some combination of associated

accessories. A potential package comprised of an iPod shuffle with a specific storage capacity, a case holder, headphones, speakers, car audio integration kit, power kit, and warranty terms, all of which were bundled together at a specific price point. In the CBC study, participants answered 24 choice questions. In each choice question participants were shown three different iPod packages and were asked to choose the package they would buy if they had to buy one or choose 'None of these' if they did not like any of the packages in the choice question. After they answered all 24 choice questions, they saw the specific iPod package that was available for purchase. Subsequently, participants saw a final holdout choice question, which required them to choose one iPod package from 16 different alternative package designs or 'None of these' if they did not like any of the designs shown. Subsequently, study participants learned that a randomly selected participant would receive \$250, which they could use to buy the iPod package. Figure 1 shows the procedure used to determine whether they got the chance to buy the package and at what price.

Figure 1: Price determination Mechanism in the Product Incentive Scheme



As shown in Figure 1, we predict a randomly selected respondent's willingness to pay for a digital camera using their answers to the study questions. The respondent is required to buy the camera at the predicted price using the \$250 we give them at the beginning if our random draw is less than their willingness to pay. On the other hand, if the outcome of the random draw is greater than their willingness to pay then they cannot buy the digital camera and get to keep the \$250.

In the Product Incentive Scheme, study participants face unattractive outcomes if they do not answer CBC questions truthfully. If their choices in the CBC choice questions are inconsistent with their true preferences, then the estimated willingness to pay for the package (i.e. WTP in Figure 1) would be either too low or too high. If it is too low, then the chances of being able to buy the package at an attractive price decreases, as the random number (i.e. x in Figure 1) that is drawn is likely to be higher than the estimated willingness to pay. In contrast, if the estimated willingness to pay is too high, then they would end up paying more than the package is worth to them. Thus, the Ding study improves partworth estimation by inducing respondents to reveal their true preference that enhances data quality.

In general, a CBC study consists of three stages, each of which offers opportunities to improve our ability to estimate partworths accurately. The three stages are: (a) Design of the CBC study, (b) Data Collection from consumers, and (c) Estimation of partworths. In the design stage, decisions are made about how many attributes and how many levels for each attribute need to be included in the study, how questions are generated (e.g. fixed ahead of time or generated on the fly), number of questions to ask, etc. After the design phase, data collection takes place, and after data collection is complete, partworths estimation takes place. Considerable research exists that demonstrates different ways by which we can improve partworth recovery at the design, data collection, and estimation stages. For example, for the design stage, there is extensive literature on question design that investigates the impact of alternative questions selection mechanisms on partworth recovery (Louviere et al. 2008, Toubia, Hauser, and Garcia 2007, Yu, Goos, and Vandebroek 2009). At the data collection stage, research has examined alternative approaches to engage consumers in the CBC study so that consumers make accurate choices, which would enhance data quality, thereby resulting in accurate partworth estimation (Dahan, Soukhoroukova, and Spann 2007, Ding 2007, Ding, Park, and Bradlow 2009, Park, Ding, and V. Rao 2008). Similarly, for the estimation stage, there is literature that investigates the impact of alternative estimation methods on partworth recovery (Allenby et al. 2005, Evgeniou, Pontil, and Toubia 2007, Liu, Otter, and Allenby 2007). Netzer et al. (2008) and Rao (2008) provide an overview of state-of-the-art conjoint analysis and important research in this area.

In this paper, we investigate the effectiveness of competitive incentive schemes to improve the quality of data collected by examining their impact on our ability to recover partworths accurately. Thus, our paper falls into the stream of literature that attempts to improve partworth recovery by improving the quality of the data collected. Specifically, our paper contributes to the growing literature (see Dong, Ding and Huber 2009, Park, Ding, and Rao 2008, Ding, 2007, Ding, Grewal, and J. Liechty 2005) on the use of incentive schemes to encourage truth-telling in conjoint studies by establishing the superiority of competitive incentive schemes (i.e. the Award Incentive Scheme and the Hybrid Incentive Scheme) relative to a lottery incentive scheme (i.e., the Product Incentive Scheme). Our results also demonstrate the robustness of the lottery incentive scheme introduced in the Ding study for a different product category (i.e. iPods in the Ding study and digital cameras in our paper). Finally, from a theoretical perspective we show that offering higher fixed-fee compensation does not improve partworth recovery. These results extend our understanding of the effectiveness of different incentive structures (i.e. competitive, lottery, and fixed-fee) in the context of conjoint studies.

DATA AND METHODOLOGY

Using digital cameras as a context, we investigated the effectiveness of the following five schemes 1.) Product Incentive, 2.) Award Incentive, 3.) Hybrid Incentive, 4.) Strong Flat Fee and 5.) Weak Flat Fee. In the Product Incentive scheme, study participants knew that a randomly selected participant would be given \$300 that could be used to buy a digital camera at the end of the study. Respondents were informed about how the price for the digital camera would be determined using the process outlined in Figure 1. In the Award Incentive Scheme, study participants were told that, apart from a flat fee (\$15), an award of \$300 can be won by one participant in the research study. We informed respondents that they would

answer 24 choice questions and a final holdout choice question. We informed them that their answers to 16 randomly selected choice questions out of the 24 choice questions will be used to predict their choices for the remaining 8 choice questions. The participant whose choices we are able to predict the best will be the winner of \$300. The Hybrid Incentive Scheme combines features of the Product Incentive and the Award Incentive schemes. In the Hybrid Incentive Scheme, study participants followed a similar sequence of activities as the Product Incentive Scheme. In other words, they answered 24 choice questions, saw a product that they could potentially buy, and answered a final holdout question. However, unlike the Product Incentive Scheme, instead of a random selection process the procedure outlined in the Award Incentive Scheme was used to select the participant chosen to buy the product shown after 24 choice questions. Instead, we used the procedure outlined in the Award Incentive Scheme to select the study participant. Thus, the Hybrid Incentive Scheme combines the competitive nature of the Award Incentive Scheme and the truth-telling component of the Product Incentive Scheme. Figure 2 shows the compensation schemes we evaluated in this paper.

The Ding study showed that truth-telling (i.e. answering choice questions consistent with that of their underlying preferences) is the unique Bayesian Nash Equilibrium in the context of the Product Incentive Scheme. In the appendix, we show that truth-telling is not the only equilibrium strategy in the Award Incentive Scheme. Any strategy that requires respondents to be consistent with some arbitrary preference structure is an equilibrium strategy. The presence of multiple equilibria in the Award Incentive Scheme is not surprising as, unlike the Product Incentive Scheme, the Award Incentive Scheme does not have any mechanism to induce truth-telling in study participants. Therefore, we decided to structure the experiment such that study participants did not have sufficient time or knowledge to think of an alternative to truth-telling. We elaborate on this issue in the context of experimental design in the next section. Since the Hybrid Incentive Scheme study incorporates the truth-telling component of the Product Incentive Scheme, the unique Bayesian Nash Equilibrium in the Hybrid Incentive Scheme is truth-telling.

Experimental Design Decisions

We imposed four overall constraints on our experimental design. One, we wanted to keep the power of incentives offered on par with that of the Ding study. Two, we wanted to choose a product that was different, but related to the iPod so that we can extend our understanding of the effectiveness of the product incentive to another product category. Three, we wanted to keep the complexity of the CBC study as similar as possible to that of the Ding study. Fourth, we designed our experiments such that, to the extent possible, the only difference between all five experiments is the incentive scheme used in the experiment. These constraints ensure that we are making an ‘apples-to-apples’ comparison when we compare and contrast the hit rates found in the Ding study vis-à-vis the five experiments in our study. Finally, our research budget constraints prevented us from considering a more expensive product, such as a laptop.

The constraints on the experimental design mentioned above led us to choose digital cameras as the product in our CBC study. Specifically, digital cameras are as attractive as iPods to undergraduate students and the pricing of digital cameras and iPods tend to be in the same ballpark range, which ensures that we keep the power of incentives similar to that of the Ding study. Digital cameras, as a context for ratings-based conjoint, was also successfully used with student respondents by Netzer and Srinivasan (2009).

The amount of time and effort it takes to answer choice questions accurately depends on the complexity of the CBC study. The complexity of a CBC study increases as the number of features and the number of levels per feature increase. In light of the above, we decided to keep the number of features and the number of levels per feature as identical as possible to that of the Ding study.

Figure 2: Compensation Schemes Evaluated

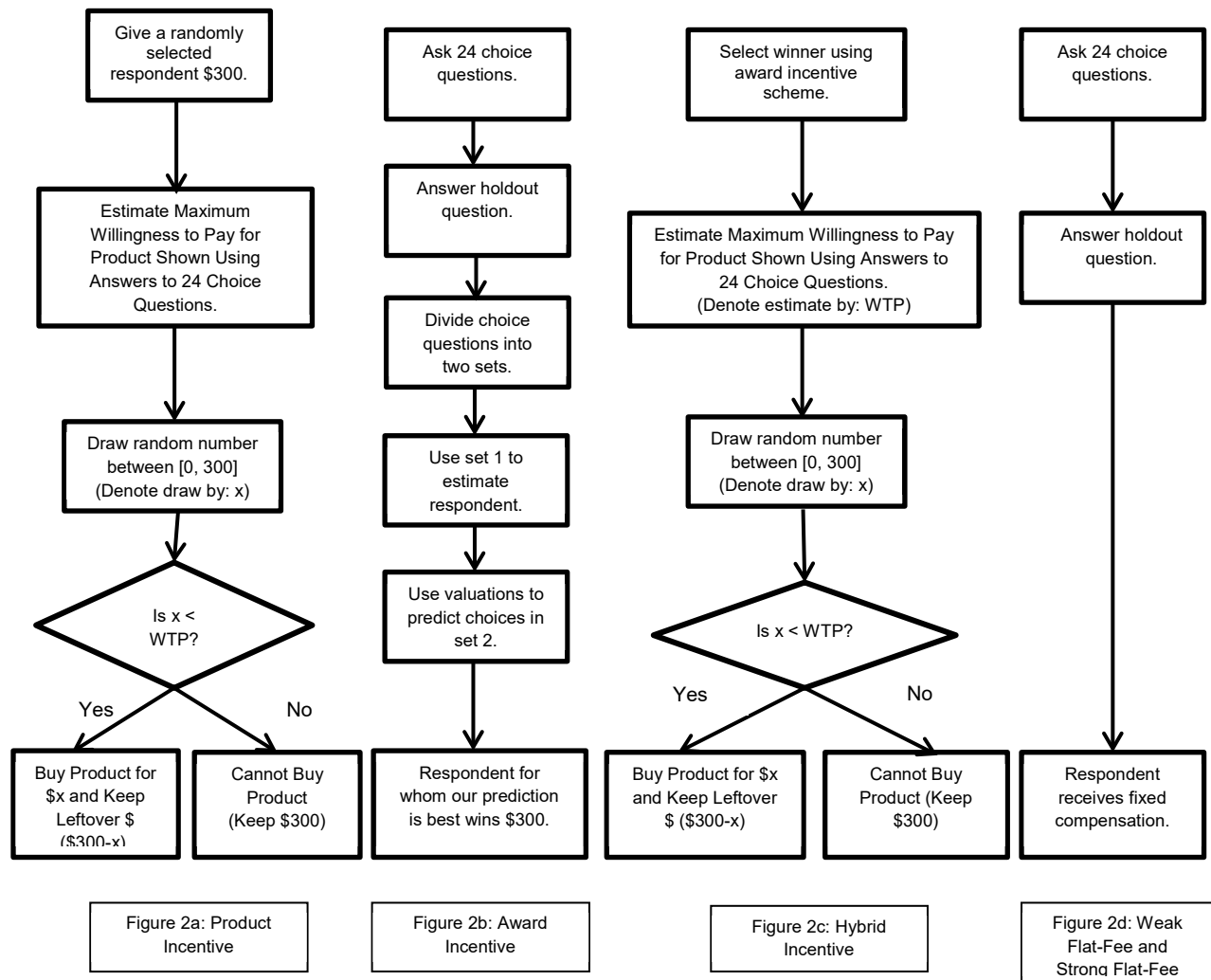


Figure 2 shows the structure of the different incentive schemes. In particular, Figure 2a shows the structure of the product incentive scheme where a randomly selected respondent is offered the opportunity to purchase a digital camera on the basis of their predicted willingness to pay for the digital camera. Figure 2b shows the structure of the award incentive where the choice questions are split into two sets. We use one set to estimate partworths and then predict the respondent's choices for the other set using the estimated partworths from the first set. The respondent for whom our predictions are the best wins a monetary award. Figure 2c shows the hybrid incentive scheme that combines the features of the product incentive and the award incentive schemes. Finally, Figure 2d shows the structure of the weak flat fee and the strong flat fee in which the respondent gets a fixed fee regardless of how they answer the study questions.

Table 1 has the list of product features and corresponding levels used in the Ding study and in our five experiments. Our choice of features and levels are similar to that of Netzer and Srinivasan (2009) and an informal survey of brands available at Best Buy's website validated these choices. A pilot study with undergraduate students also validated our choices. Our choices resulted in a $2^1 \times 3^6 \times 4^1$ design, which is comparable to the $2^2 \times 3^5 \times 4^1$ design used by the Ding study. Thus, the complexity of our design is similar to the one in the Ding study.

Table 1: Product Features and Levels used in the Ding Study and the Five Experiments in this Paper

iPod Package			Digital Camera		
Features	No. of Levels	Values	Features	No. of Levels	Values
Storage	2	512 MB, 1 GB	Movie Mode	2	Not Present, Present
Case Holder	3	None, armband, sport case	Color	3	Black, Silver, Blue
Headphones	3	Apple standard, Nike Vapor, Nike Duro	Internal Storage	3	8 MB, 16 MB, 32 MB
Speakers	3	None, Monster, Creative	LCD Screen	3	1-inch, 2-inch, 3-inch
Car Audio	3	None, Cassette, Adapter, FM Transmitter	Brand	3	Canon, Nikon, Sony
Power	3	USB, USB + Battery, USB + Power Adapter	Optical Zoom	3	1x, 2x, 3x
Warranty	2	Basic, Extended	Megapixels	4	7, 8, 9, 10
Price	4	\$129, \$159, \$189, \$219	Price	3	\$149.99, \$185.99, \$219.99

Table 1 shows the number of levels and the number of attributes that were present in the conjoint experiments in the Ding study and in our paper. As Table 1 shows, the complexity of the choice decision faced by respondents in both conjoint studies is similar.

Similar to the Ding study, we generated a fixed efficient design using SAS and modified the design to eliminate dominated alternatives. Participants in all five studies answered 24 choice questions each, one of which asked them to choose from one of three digital camera designs and a ‘None of these’ alternative in case they did not like any of the designs shown in that choice question. A final holdout choice question required them to choose one alternative from among 16 different digital camera designs and a ‘None of these’ alternative in case they did not like any of the designs shown in the holdout choice question. In the Product Incentive Scheme and the Hybrid Incentive Scheme, participants saw the product they could buy after they completed answering all 24 choice questions, but before they answered the holdout question.

In the Ding study, the holdout question showed 16 different iPod packages and the selected participant was required to purchase the chosen holdout alternative if the outcome of a coin toss was tails (see Figure 1). Thus, the effectiveness of the Product Incentive Scheme in the Ding study was evaluated using realistic product choices. However, designing a holdout question such that all the alternatives in the holdout are available for purchase is not always easy or even desirable. Note that, to the extent feasible, a holdout question should have the same ‘type’ of product profiles as were used in the estimation set. Conjoint studies usually include hypothetical levels to take product design decisions and construct an unrealistic combination of levels into product profiles so that the resulting experimental design is efficient. In contrast, realistic products do not have unrealistic levels and do not have an unrealistic combination of levels. Thus, constructing a realistic holdout question that accurately mirrors the product profile in the estimation set is not easy.

If the profiles in the holdout question are very different than the profiles in the estimation set, then our ability to predict the holdout choices may be poor. In such a situation, it is not possible to ascertain if our inability to predict the holdout choices is because the holdout profiles are very different compared to the choice profiles or because the incentive scheme is ineffective. The Ding study’s choice of an iPod package was a product bundle offered by the author, which made it easy to construct a holdout question with realistic profiles that were similar to the ones shown in the choice set. In our context of digital cameras, we found that constructing a realistic holdout set that is also similar to the profiles in the estimation set was not easy. Thus, we chose to use include hypothetical profiles in the holdout task instead of actual digital cameras.

As we mentioned earlier, truth-telling is not the only equilibrium strategy in the Award Incentive Scheme. Therefore, several of the CBC study decisions we took are designed to encourage study participants to answer choice questions according to their true preferences. Specifically, note the following points: 1.)

While respondents did know the features they would see in the various CBC questions, they did not know the corresponding levels for the features or the choice questions in the study, 2.) Respondents were told not to use the browser's forward or backward buttons, but to use the links provided within the web page to go to the next question. Each choice question had a link to go to the next question, but not to the previous one, 3.) Participants were told that even if they were to go back and change some of their answers their changes would not be stored by the server, 4.) Each choice question was expired in the cache so that a re-load required an explicit page reload from the web server. The web server would then skip all the choice questions that had been answered by the respondent and show the first as yet unanswered choice question, 5.) A participant could take the survey just once, after which they would not be able to log in to do the survey again.

The above decisions have the following consequences for respondents: (a) respondents have to answer a choice question without any knowledge of future choice questions, (b) they cannot go back to change their answers, (c) they cannot go back to see how they answered previous choice questions so that they can choose a consistent answer for a choice question. Therefore, answering choice questions truthfully is likely to be an easier task than trying to be consistent across all choice questions in some arbitrary manner. To reinforce truth-telling as a viable strategy, participants were explicitly told that answering the choice questions consistent with their true preferences would maximize their chances of winning \$300. Finally, respondents were told about the award of \$300 only after they arrived in the lab, but before they started the study, and hence, we do not think that they had sufficient time come up with an alternative to truth-telling.

Recruitment Procedures

Study participants for each one of five CBC studies were recruited from among undergraduates at a regional state university in the United States in the year 2009. The participants for all studies were recruited via email using a list provided by the university. The email list excluded students from the Business School at the University so that the students would not feel compelled to answer survey questions diligently just because they know the researcher. Our recruitment emails generated the following sample sizes: Weak Flat-Fee: 28, Strong Flat-Fee: 19, Product Incentive: 24, Award Incentive: 21, and Hybrid Incentive: 22. These sample sizes are comparable to experiment 1 of the Ding study, whose sample sizes were: Product Incentive: 25 and Weak Flat-Fee: 24.

To preserve the integrity of all experiments, we did not disclose the full compensation structure in the recruitment email. The recruitment email for the Award, Weak Flat-Fee, and Strong Flat-Fee schemes mentioned that participants would earn \$15 for participating in a study that would take about an hour of their time. In contrast, the recruitment email for the Product Incentive study mentioned that participants would earn \$10 and the recruitment email for the Hybrid Incentive study mentioned that participants would earn \$20. We offered \$10 instead of \$15 to students in the Product Incentive study to maintain parity with the Ding study, which also offered \$10 to study participants. The Hybrid Incentive Scheme was the last study to be conducted and we increased the compensation to \$20 with the hope that we would obtain a higher sample size.

Study participants in the Product, Award, Hybrid, and Strong Flat-Fee were informed about the true compensation structure after all participants arrived at the campus lab to participate in the study, but before they actually started answering the CBC questions. Our disclosure of the additional compensation after all participants showed up in the lab ensured that students in all experiments had similar motivation to attend the study and that there were no attempts made to figure out the survey questions in advance. In addition, we wanted to ensure that participants in the Product Incentive and Hybrid Incentive studies were adequately motivated to answer CBC questions and we wanted to maintain parity with the Ding study. Therefore, we told potential participants in the Product and Award incentive studies that they should

agree to participate if they had an interest in buying a digital camera over the next few months. The Ding study had a similar qualification criterion.

The difficulty of choice questions and the ease with which a participant can make a choice depend on the degree of knowledge a participant has with respect to digital cameras. An expert in digital cameras who has a lot of experience in the area would probably find it very easy to make choices that reflect their true preferences, whereas a novice would find it very hard. Therefore, to equalize the knowledge level across all experiments for all participants we provided a glossary of digital camera features that help in answering the choice questions (see Table 2). It is possible to swing from one extreme, where we do not provide any information whatsoever, to the other extreme, where we discuss the fine details of the difference between 7 megapixels versus 8 megapixels. We chose a middle ground, which we felt was a reasonable compromise between the two extremes. Table 2 shows the information that was available to the study participants before they started answering the conjoint questions. In summary, respondents knew which features they would see in the CBC questions and what the features meant, but were *not informed* about the specific levels that would appear in the CBC question for each one of these attributes.

Table 2: Glossary of Product Features Shown to Study Participants in all five Experiments

Features	Description
Brand Name	The brand names you will see in the study are well known brand names.
Color	The colors you will see in the study are some of the typical colors available for a digital camera.
Internal Memory	Internal memory refers to the amount of storage that is integrated with the camera. The more memory there is, the more pictures you can store on the camera.
LCD Size	LCD screens let you frame the shot, review the shots after they have been taken, and display various menu settings. In general, bigger sizes offer more flexibility.
Movie Mode	Movie mode refers to the ability of the camera to take short video clips.
Optical Zoom	Optical zoom magnifies images so you can take close-up shots of faraway objects. The higher the zoom (say 3x as opposed to 2x), the better will be your ability to zoom in on a faraway object.
Megapixels	Megapixels refer to the clarity that an image has. The higher the megapixels, the lower the quality when you enlarge the image.
Price	All prices are in U.S. dollars.

Table 2 shows the information study participants were shown before they started making choices.

Estimation

Consistent with the Ding study and following the current practice in estimating choice models (see Allenby and Ginter (1995) and Allenby, Arora, and Ginter (1998) for similar models) we used a hierarchical Bayesian multinomial logit model to estimate individual partworths in all experiments. Specifically, we assumed that the utility of the i^{th} study participant for the a^{th} alternative in the q^{th} question is given by:

$$U_{iqa} = X_{qa}\beta_i + \epsilon_{iqa} \tag{1}$$

where,

X_{qa} is a $1 \times p$ design vector representing the a^{th} alternative in the q^{th} question,

β_i is a $p \times 1$ vector that represents the i^{th} participant's partworth values,

ϵ_{iqa} is random error that is independently, identically distributed as extreme value and

p is the number of partworths we are estimating.

Thus, the probability that the i^{th} participant chooses the a^{th} alternative in the q^{th} choice question is given by:

$$P(y_{iq} = a) = \frac{\exp(X_{qa}\beta_i)}{\sum_a \exp(X_{qa}\beta_i)} \tag{2}$$

We further assumed that the individual partworth vectors, β_i , follow a normal distribution as given below:

$$\beta_i \sim N(\bar{\beta}, \Sigma) \tag{3}$$

We assumed a diffuse conjugate prior for $\bar{\beta}$ (i.e. a normal distribution centered at 0 and a ‘large’ variance) and a conjugate Wishart distribution for Σ^{-1} , whose mean is an identity matrix and whose degrees of freedom equal the number of parameters we are estimating in our model (i.e. we set the degrees of freedom to equal p) Using the above assumptions, we estimated five HB multinomial logit models for each one of the five experiments and assessed convergence by running three parallel MCMC chains from dispersed starting points. We estimated the posterior means for partworths to compute hit rates only after trace plots of a few randomly selected parameters and the potential scale reduction factor indicated that that we had achieved convergence (see Gelman et al. 2004; see pg. 297 for a discussion of the role of potential scale reduction factor in assessing convergence of MCMC chains). Table 3 summarizes the decisions we took across each one of the three stages (i.e. Experimental Design, Data Collection, and Estimation) of a typical CBC study. For the most part, the differences are relatively minor. Apart from the differences in the incentive structures per se, two major differences exist, which can potentially offer an alternative explanation for some of our results. One, all the experiments, including the Ding study, are between subject experiments. Thus, we cannot completely rule out differences in subject populations as a potential explanation for our findings. Two, the choice of product categories (digital cameras vs. iPods) can make a difference. However, this difference between the experiments can only explain any pattern of results between the five studies we ran and the experiments of the Ding study. In summary, the above discussion and Table 3 suggests that, for the most part, any differences in hit rates are due to the differences in incentive structures between the experiments.

Table 3: Differences and Similarities between the Five Experiments and with Experiment 1 from the Ding study

Stage of CBC Study	Decisions Regarding	Weak Flat-Fee	Strong Flat-Fee	Award	Product	Hybrid	Product (from the Ding Study)
Experimental design	Conjoint task	24 CBC questions from a fixed, efficient design.					
	Holdout task	16 alternatives plus a ‘None of these’ alternative					
	Study complexity	$2^1 \times 3^6 \times 4^1$					$2^2 \times 3^5 \times 4^1$
	Product	Digital cameras					iPod Bundle
	Type of study	Between subjects					
Data collection	Qualification criteria	Greater than 18 years of age.			Greater than 18 years of age and must have an interest in buying a camera over the next few months.		
	Respondent profile	Undergraduate students					Undergraduate and Graduate Students
	Knowledge of participants	Identical controls (See Figure 3)					
	Study location	Campus lab					
	Compensation in recruitment email	\$15 for 1 hour*; no mention of any extra compensation.					
Partworth estimation	Informed of additional compensation	Not Applicable	After all participants arrived at the lab but before they started the study.			Not Known	
	Technology and non-Technology controls	Identical controls (See Section: “The Three CBC Studies”)					
	Model	HB Multinomial Logit with Conjugate Priors					
	No. of parameters estimated	16					14

Table 3 shows the various experimental design decisions that were made in the Ding study and in our paper. The table indicates that the experiments in our paper are similar to the one done in the Ding study. *Study participants in the Product Incentive Scheme were offered \$10 instead of \$15 and participants in the Hybrid Incentive Scheme were offered \$20.

RESULTS

In this section, we compare the relative performance of the Product Incentive, Award Incentive, Hybrid Incentive, and Strong Flat-Fee incentive scheme vis-à-vis the Weak Flat-Fee Incentive Scheme using in-sample goodness of fit and out-of-sample predictions. For both in-sample goodness of fit and out-of-sample predictions we used two metrics to assess performance, which, for ease of exposition, we henceforth refer to as ‘Top Hits’ and ‘Top Two Hits.’ The ‘Top Hits’ metric is identical to the hit rate used in the literature to evaluate the performance of competing research methods in predicting answers to choice questions. In other words, for a particular choice question, we used the estimated partworths to compute the utilities of all the alternatives in that choice question. If the alternative with the maximum estimated utility is identical to the actual choice of a respondent, then we count it as a ‘hit.’ We then computed the percentage number of hits for each respondent and reported the average percentage across all respondents. Top ‘Two Hits’ are computed in a similar way, with one difference: when computing a top two hit, we count a prediction as a ‘hit’ if a respondent’s answer to a choice question is identical to either the alternative with the highest estimated utility or the alternative with the second-highest estimated utility. Where appropriate, we also report hit rates from experiment 1 of the Ding study.

Panel A in Table 4 reports the in-sample goodness-of-fit for the competing incentive schemes. We also report the relative improvement of the Product, Award, Hybrid, and Strong Flat-Fee incentive schemes vis-à-vis the Weak Flat-Fee Incentive Scheme and the corresponding p-values, which were computed using bootstrap. Consistent with the findings of the Ding study, the in-sample goodness of fit of the Product and Weak Flat-Fee incentive schemes are comparable to each other. In addition, the Strong Flat-Fee Incentive Scheme also shows comparable in-sample goodness-of-fit. However, the in-sample goodness of fit for the Award and Hybrid incentive schemes is significantly better than that of the Weak Flat-Fee Incentive Scheme. These results suggest that respondents in the Award and Hybrid incentive schemes were more consistent in their answers when responding to choice questions as compared to the respondents in the other three incentive schemes.

Panel B in Table 4 reports the out-of-sample predictions for the competing incentive schemes. Four points are of interest. One, somewhat surprisingly, the Strong Flat-Fee Incentive Scheme is not better than the Weak Flat-Fee Incentive Scheme in out-of-sample predictions. Two, the hit rates for the Product Incentive Scheme in our study and that of the Ding study are similar. Three, the Product Incentive Scheme outperforms the Weak Flat-Fee Incentive Scheme in predicting out-of-sample choices by a 2 to 1 margin (Hit rates: 29% vs. 14%). Finally, both the Award and Hybrid incentive schemes outperform the Product Incentive Scheme in predicting out-of-sample choices by a 2 to 1 margin (Hit rates: 62% vs. 14%) and a 1.4 to 1 margin (Hit Rates: 41% vs. 29%) respectively. We elaborate on these findings over the next few paragraphs.

The performance of the Product Incentive Scheme in our study is comparable to the performance of the Product Incentive Scheme of the Ding study, thus validating the effectiveness of the Product Incentive Scheme when predicting hypothetical choices in a different product category and with a different respondent population. These results establish the robustness of the Product Incentive Scheme in motivating respondents in CBC studies to answer choice questions consistent with their underlying preferences.

Table 4: In-Sample Goodness of Fit and Out-of-sample Predictions for Competing Incentive Schemes

Incentive Scheme	Top Hit	Difference vis-à-vis Weak Flat Fee	p-value	Top Two Hits	Difference vis-à-vis Weak Flat Fee	p-value
Panel A: In-Sample Goodness of Fit for Competing Incentive Schemes						
Weak Flat Fee	87%			96%		
Strong Flat Fee	84% [*]	-3%	0.08	96%	0%	0.48
Product	88%	1%	0.31	97%	1%	0.20
Award	92% ^{***}	5%	0.00	99% ^{***}	3%	0.00
Hybrid	92% ^{***}	5%	0.00	99% ^{***}	3%	0.00
Weak Flat Fee (Ding Study)	78%				Not known	
Product (Ding Study)	78%	0%	0.49			
Panel B: Out-of-sample Predictions for Competing Incentive Schemes						
Weak Flat Fee	14%			39%		
Strong Flat Fee	21%	7%	0.25	32%	-6%	0.29
Product	29% [*]	15%	0.09	54%	15%	0.13
Award	62% ^{***}	48%	0.00	76% ^{***}	37%	0.00
Hybrid	41% ^{**}	27%	0.02	64% ^{***}	35%	0.04
Weak Flat Fee (Ding Study)	17%			38%		
Product (Ding Study)	36% [*]	19%	0.09	64% ^{**}	26%	0.04

Table 4 reports in-sample goodness of fit and out-of-sample predictions for competing incentive schemes.

As described next, we performed additional analysis to understand better the reasons for the poor performance of the Strong Flat-Fee Incentive Scheme. We estimated the partworths of all respondents using their answers to the first 10 choice questions and computed hit rates with respect to their choices for the 11th choice question. Similarly, we used their answers to the first 23 choice questions and computed hit rates with respect to the 24th choice question. As originally pointed out in the Ding study, the above tests of out-of-sample performance are weak because we need to predict correctly only 1 out of 4 possible alternatives.

Table 5: Out-of-sample Hit Rates for the Competing Incentive Schemes when Predicting the Choices for the 11th and the 24th Choice Question

Incentive Scheme	Top Hit	Difference vis-à-vis Weak Flat Fee	p-value	Top Two Hits	Difference vis-à-vis Weak Flat Fee	p-value
Panel A: Out-of-sample Hit Rates for the Competing Incentive Schemes When Predicting the Choices for the 11th Choice Question						
Weak Flat-Fee	29%			54%		
Strong Flat-Fee	58% ^{**}	29%	0.02	84% ^{***}	30%	0.01
Product	63% ^{***}	34%	0.01	75% ^{**}	21%	0.05
Award	67% ^{***}	38%	0.00	86% ^{***}	32%	0.01
Hybrid	86% ^{***}	57%	0.00	95% ^{***}	41%	0.00
Panel B: Out-of-sample Hit Rates for the Competing Incentive Schemes When Predicting the Choices for the 24th Choice Question						
Weak Flat-Fee	57%			86%		
Strong Flat-Fee	58%	1%	0.47	95%	9%	0.14
Product	46%	-11%	0.20	75%	-11%	0.15
Award	67%	10%	0.24	95%	9%	0.12
Hybrid	73%	16%	0.12	95% [*]	9%	0.10

Table 5 reports out of sample hit rates for the 11th and the 24th choice question.

Panels A and B in Table 5 reports the top hits and top two hits when predicting respondents' choices for the 11th choice question and for the 24th choice question respectively. When we compare the 'top hit'

results from Table 4 and Table 5, we see the following pattern with respect to the performance of the four competing schemes (i.e. the Strong Flat-Fee, the Product Incentive, the Award Incentive, and the Hybrid Incentive) vis-à-vis the Weak Flat-Fee: 1.) All four competing schemes outperform the Weak Flat-Fee when predicting choices for the 11th choice question, 2.) All four competing schemes are comparable to the Weak Flat-Fee when predicting choices for the 24th choice question, 3.) The Strong Flat-Fee is comparable to the Weak Flat-Fee when predicting holdout choices, 4.) In contrast, the Product Incentive, Award Incentive, and Hybrid Incentive are better than the Weak Flat-Fee in predicting holdout choices.

The above pattern of results suggests that in the Strong Flat-Fee experiment respondents answer choice questions accurately at the beginning of the study, but are unable to maintain their accuracy levels for the entire duration of the study. In contrast, respondents in the Product, Award, and Hybrid incentive schemes are able to answer choice questions accurately for the entire duration of the study, which eventually translates into superior hit rates for the holdout question. In other words, the increase in compensation from \$15 (as promised in the recruitment email) to \$50 on the day of the study motivates respondents to answer CBC questions accurately, but their motivation weakens towards the end of the study. We now discuss the superiority of the Award and Hybrid incentive schemes.

There are two possible explanations for the superiority of the Award Incentive study. It is possible that respondents find it easier to be consistent instead of answering choice questions according to their true preferences. For example, a respondent can potentially select 'None of these' across all choice questions, including the holdout, and be a potential winner. While we took steps to encourage truth-telling for the participants in the Award Incentive study, we cannot completely rule out the above possibility. The second explanation relies on the differences in the structure of the Award Incentive and Product Incentive studies. The Product Incentive Scheme is a lottery scheme where a respondent obtains additional payoff (via \$300 and the opportunity to buy the digital camera) only if he/she is selected by the random draw. On the other hand, the Award Incentive Scheme is a competitive scheme where a respondent obtains the additional payoff of \$300 only if they win the competition by being the person whose choices we were able to predict the best. Thus, it is possible that respondents in the Award Incentive Scheme are better motivated because of the competitive nature of the scheme to answer choice questions consistent with their true preferences. Unfortunately, in the Award Incentive study, the above two explanations are confounded, and hence, we cannot definitively identify which explanation is the primary reason for the superiority of the Award Incentive Scheme.

In contrast, the structure of the Hybrid Incentive study allows us to offer a cleaner explanation for its superiority. Unlike the Award Incentive Scheme, the Hybrid Incentive Scheme motivates respondents to truth-telling. Similar to the Product Incentive Scheme, if a respondent were to answer choice questions untruthfully, they face potentially unattractive outcomes if they are the winner of the competition. Answering choice questions inconsistent with their true preferences would result in either a low or a high estimate for their willingness to pay for the product that is available to purchase. If it is low, then the chances of their being able to buy the product decreases, whereas if it is too high, then they may end up paying more than their true willingness to pay. Therefore, in the Hybrid Incentive Scheme, respondents have an incentive to not only be consistent, but to also be truth-telling. Thus, the superiority of the Hybrid Incentive Scheme vis-à-vis the Product Incentive Scheme can be attributed to the competitive nature of the scheme.

In Table 6, we report the utility decrease for a \$100 increase in price from the five experiments we conducted and from experiment 1 of the Ding study. As Table 7 indicates, the Ding study found that mean price sensitivity in the Product Incentive Scheme was comparable to that of the Flat-Fee schemes. Our findings in the context of digital cameras indicate the opposite effect. In our experiments, participants in the Product Incentive Scheme were the most sensitive to price changes, followed by the Award Incentive and Hybrid Incentive schemes. Participants in the Weak Flat-Fee and the Strong Flat-Fee incentive

schemes had comparable price sensitivities. The extent of heterogeneity among participants on price sensitivity also show a different pattern when we compare our findings with that of the Ding study. Specifically, in the Ding study, participants were more heterogeneous in the Flat-Fee Schemes, whereas in our study participants were more heterogeneous in the Product, Award, and Hybrid incentives with participants in the Hybrid Incentive being the most heterogeneous. The Ding study suggested that the difference in price sensitivity patterns is probably due to the price intervals used in the experiments (i.e. the maximum and the minimum price differences between the alternatives). In our experiments, the minimum and the maximum possible price difference between the alternatives were similar to that of the Ding study (\$30, \$90 in the Ding study and \$34.50, \$70 in our study). Since, our findings are the opposite to those of the Ding study, despite similar price intervals; we can discount price intervals as an explanation for the price sensitivity findings across all the experiments.

Table 6: Utility Decrease per \$100 Increase in Price from Our Study and from that of the Ding Study (Figures in Brackets Are Standard Deviations)

Incentive Scheme	Valuation	Heterogeneity
Weak Flat-Fee	-3.21 (0.53)	4.14 (1.89)
Strong Flat-Fee	-3.52 (0.74)	6.58 (3.86)
Product	-6.89 (0.85)	9.97 (5.30)
Award	-5.77 (1.09)	17.38 (9.38)
Hybrid	-5.14 (1.27)	24.99 (12.71)
Flat-Fee (Ding Study)	-5.87 (0.66)	6.12 (2.83)
Product (Ding Study)	-5.43 (0.47)	1.96 (1.25)

Table 6 reports the utility decrease per \$100 increase in price in our study and that of the Ding study. Figures in brackets are standard deviations for the corresponding estimates.

CONCLUDING COMMENTS

In this paper, we investigated the performance of five types of incentive schemes (i.e. the Hybrid Incentive Scheme, the Award Incentive Scheme, the Product Incentive Scheme, the Weak Flat-Fee Incentive Scheme, and the Strong Flat-Fee Incentive Scheme) in motivating respondents to answer choice questions accurately in a CBC study. We designed an experimental study using digital cameras as the product context and recruited undergraduate students from a large regional state university in the United States in the year 2009. The standard hierarchical Bayesian model multinomial logit model was used to estimate individual partworths and the estimated partworths were used to predict hold-out choices. Our results indicate that the Award and Hybrid incentive schemes are superior to the Product Incentive Scheme, which suggests that incentive schemes that induce competition among respondents are better than those that do not. In addition, the robustness of the Product Incentive Scheme in predicting hypothetical choices is reassuring. From a theoretical perspective, we find that while a higher fixed-fee does motivate respondents to be accurate, their accuracy levels drop toward the end of the CBC study.

The superiority the Award Incentive Scheme comes at a cost. Unlike the Product Incentive Scheme, the Award Incentive Scheme does not have any mechanism to motivate respondents to be truthful. Consequently, respondents may simply be consistent, with some arbitrary preference structure instead of their true preferences. However, the Hybrid Incentive Scheme does not have any such disadvantages as it builds on the strengths of the Award and Product incentive schemes, namely competitiveness and truth-telling. Therefore, the Hybrid Incentive Scheme is a viable incentive scheme that can be used by practitioners and academics to motivate respondents to be truthful.

Our results also suggest three important areas for future research. One, our findings regarding price sensitivity is not consistent with the findings of the Ding study. Further research is needed to better understand how price sensitivity changes when consumers are offered different types of truth-telling versus fixed-fee compensation schemes. Two, competitive incentive schemes have the potential to

discourage some of the study participants from fully engaging in the study if they believe that they do not stand a chance of being a winner. Participants may feel discouraged if they do not have enough experience in the product category or if the number of competitors is too high (e.g. if one winner is being selected from 300 respondents). Therefore, it is important to investigate the impact of product knowledge and sample size on the effectiveness of competitive incentive schemes. Three, one of the limitations the present paper is the low sample sizes in each one of our studies. Although the sample sizes were consistent with previous work in the area we still feel that it is important to assess the effectiveness of the Product and Award incentive schemes with higher sample sizes in order to test their robustness in motivating respondents to answer CBC questions truthfully. We hope to address some of these issues in future research.

APPENDIX

Bayesian Nash Equilibrium for the Award Incentive Study

Conditions of CBC Study:

For simplicity, we impose some conditions on the CBC study as given below:

Condition C1: There are 2 respondents in the study.

Condition C1 is not restrictive from a game theoretic perspective. Increasing the number of respondents from 2 to an arbitrary number, say n , will increase our mathematical burden without lending any additional insight.

However, note that robust estimation (e.g. using HB multinomial logit) of partworths is difficult if we have data from just 2 respondents. Since, the focus of this appendix is on the equilibrium behavior of respondents and not on statistical estimation per se, we simply assume that we can estimate partworths even when we have data from just 2 respondents.

Condition C2: Answers to the first q choice questions are used to predict the choices of respondents to the $q + 1^{\text{th}}$ question.

Condition C2 specifies that respondents know that we will use their answers to the first q choice questions to predict their answer to the last choice question.

Our implementation of the Award Incentive Scheme differs from C2 in two respects. One, we predict the choices of respondents for 8 questions instead of just 1. Two, we select these 8 questions at random. Relaxing C2 to accommodate the above is not difficult, but it increases notational burden without lending any additional insight. Thus, we chose to work with C2.

Condition C3: A respondent is declared a winner if we are able to predict correctly his/her choice for the $q + 1^{\text{th}}$ choice question.

Condition C4: If there are multiple winners or if there are no winners, then a respondent selected at random will receive \$300.

Conditions C3 and C4 are not restrictive.

Assumptions:

A1: Each respondent has two strategies:

S1: 'Consistent'

S2: 'Inconsistent'

Under the Consistent strategy, a respondent answers every choice question consistent with some arbitrary partworth vector. Under the Inconsistent strategy, a respondent answers every choice question by picking an alternative at random.

Note that A1 implicitly assumes that a respondent decides whether to be 'consistent' or 'inconsistent' at the beginning of the study and sticks with that choice for all choice questions.

An enhanced strategy space can be specified by assuming that respondents choose between being consistent and inconsistent for each choice question separately. Accommodating the above enhanced strategy space would require us to suitably change our second assumption (see A2 below). Modifying A2 to accommodate the enhanced strategy space could be done along the following lines:

(a) Define degree of consistency for the i^{th} respondent, say C_i , as the "No. of choice questions for which that respondent chooses a Consistent strategy." By definition, C_i lies between 0 and $q + 1$. (b) Replace A2 by " p_i increases as C_i increases", where p_i is the probability that we can correctly predict respondent i 's choice to the $q + 1$ th question.

Our conclusion about equilibrium behavior does not change if we use (a) and (b) instead of assumptions A1 and A2. Thus, we use the simpler assumption A1. Assumption A1, while restrictive, is not critical.

Let p_c be the probability of a correct prediction to the $q + 1^{\text{th}}$ question when a respondent uses the 'Consistent' strategy. Similarly, let p_{ic} be the probability of a correct prediction to the $q + 1^{\text{th}}$ question when a respondent uses the 'Inconsistent' strategy. Finally, let β_i be the true partworth vector for the i^{th} respondent.

A2: $p_c > p_{ic}$

A3: p_c and p_{ic} do not depend on β_i ,

Assumptions A2 and A3 are the critical assumptions.

A2 simply states that the probability of a correct prediction is greater when a respondent uses a Consistent strategy. We believe A2 is a reasonable assumption as we follow standard statistical methods of estimation (i.e. HB estimation).

Consider A3. When a respondent uses the Inconsistent strategy, the probability of a correct prediction cannot be dependent on β_i because the answers to the choice questions are not dependent on the partworth vector.

In order to see why A3 is plausible when a respondent uses a Consistent strategy, consider an analogous situation involving linear regression where we have $q + 1$ observations. We want to assess how closely we can predict the $q+1^{\text{th}}$ prediction using the first q observations, just as we want to predict the $q + 1^{\text{th}}$ choice using the q^{th} answers in the CBC study. The OLS estimator is:

$$\hat{\beta} = (X'X)^{-1}X'Y \quad (\text{E1})$$

Where

X and Y are of appropriate dimensions.

Thus, the predicted observation is:

$$\hat{y}_{q+1} = x_{q+1}\hat{\beta} \tag{E2}$$

Whereas the observed value is:

$$y_{q+1} = x_{q+1}\beta \tag{E3}$$

Notice that, by analogy to the Consistent strategy, there is no error in equation E3. Therefore, the probability that \hat{y}_{q+1} is within $\pm \epsilon$ of y_{q+1} is given by:

$$P(-\epsilon \leq \hat{y}_{q+1} - y_{q+1} \leq \epsilon) \tag{E4}$$

The distribution of $d = \hat{y}_{q+1} - y_{q+1}$ is independent of the true β vector as the OLS estimate given by equation E1 is an unbiased estimate of the underlying β . Therefore, we observe that the probability given in equation E4 is not dependent on the underlying vector β .

A3 extends the above observation to the context of discrete choice models.
Analysis:

Let, p_i be the probability that the i^{th} respondent is declared a winner. Depending on the strategy used by the i^{th} respondent, p_i is equal to either p_c or p_{ic} . The expected utility for the i^{th} respondent, u_i , can be calculated, considering the following three scenarios:

Scenario 1: Only the i^{th} respondent is the winner or

Scenario 2: Both respondents are winners or

Scenario 3: Neither respondent is a winner.

Using the above logic for both respondents, we have

$$u_1 = p_1 (1 - p_2) U_1 + p_1 p_2 \frac{U_1}{2} + (1 - p_1)(1 - p_2) \frac{U_1}{2} \tag{E5}$$

$$u_2 = p_2 (1 - p_1) U_2 + p_1 p_2 \frac{U_2}{2} + (1 - p_1)(1 - p_2) \frac{U_2}{2} \tag{E6}$$

Where,

U_i : Utility of \$300 for respondent i .

Simplifying equations E5 and E6, we get:

$$u_1 = \left(\frac{1}{2} + \frac{p_1 - p_2}{2}\right) U_1 \tag{E7}$$

$$u_2 = \left(\frac{1}{2} + \frac{p_2 - p_1}{2}\right) U_2 \tag{E8}$$

Using the Consistent strategy, the unique Bayesian Nash Equilibrium provides the expected payoffs given by equations E7 and E8. This follows from the following three observations:

If both respondents use the Inconsistent strategy or if both respondents use the Consistent strategy, then the payoffs are:

$$u_1 = \frac{U_1}{2} \quad (\text{E9})$$

$$u_2 = \frac{U_2}{2} \quad (\text{E10})$$

However, when both respondents are using the Inconsistent strategy, there is an incentive for one of the respondents to deviate. For example, suppose that respondent 1 deviates by using the Consistent strategy when respondent 2 uses the Inconsistent strategy. Then:

$$\tilde{u}_1 = \left(\frac{1}{2} + \frac{p_c - p_{ic}}{2} \right) U_1 \quad (\text{E11})$$

Since $p_c > p_{ic}$, it follows that $\tilde{u}_1 > u_1$ and respondent 1 will deviate. But then the expected pay off for respondent 2 is given by:

$$\tilde{u}_2 = \left(\frac{1}{2} + \frac{p_{ic} - p_c}{2} \right) U_2 \quad (\text{E12})$$

It follows that $\tilde{u}_2 < u_2$ and, hence, respondent 2 also deviates from being inconsistent to consistent.

When both respondents use the Consistent strategy, neither respondent has an incentive to deviate as deviating reduces their expected payoff.

Therefore, it follows that using a Consistent strategy is the Bayesian Nash Equilibrium for both respondents.

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ANTI-HUMAN TRAFFICKING POLICY COMPLIANCE: THE ROLE OF CORRUPTION

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ABSTRACT

This study extends prior research regarding country compliance with international anti-human trafficking policies by empirically exploring how country corruption and economic freedom interact to impact compliance. It is posited that efforts to reduce corruption in countries that enjoy greater economic freedom will have a smaller marginal impact on policy compliance compared to nations with lower levels of economic freedom. In other words, there is inverse relationship between corruption and compliance with anti-human trafficking policies that decreases in the extent of a country's economic freedom. Using data from 140 countries, empirical evidence in this study supports this hypothesis.

JEL: O57, O15

KEYWORDS: Human Trafficking, Corruption, Economic Freedom, Cross-Country

INTRODUCTION

Globalization has transformed almost every aspect of the international community. As Freidman (2005) notes, globalization has shaped foreign relations and impacted domestic politics, culture, as well as the development of economic and social systems worldwide. While a significant body of literature has explored the outcomes associated with globalization, human trafficking has received increasing international attention. As Cho et al. (2012) note, human trafficking can be seen as one of the dark sides of globalization as the greater connectivity between countries has facilitated the illicit flows of human beings and Interpol (2009) estimates that human trafficking is the third largest transnational crime. International awareness of this issue has led to the creation of major international treaties to fight human trafficking such as the United Nations Convention Against Transnational Organized Crime and its Protocol to Prevent, Suppress, and Punish Trafficking in Persons, especially Women and Children (Protocol). Specifically, the Protocol outlines three distinct policy dimensions to fight human trafficking; the *prosecution* or criminalizing of traffickers, the *protection* and assistance for victims of human trafficking, and the *prevention* of the crime itself.

These anti-human trafficking policies have been widely accepted in the international community and a substantial number of countries and territories have adopted the Protocol treaty. Although the treaty has been widely accepted and adopted in the international community, the degree to which countries actually comply with the policies is a current topic in the literature. Specifically, there is a small, but growing body of literature exploring the factors that make countries more likely to comply with anti-human trafficking policies. These studies have found that countries with lower corruption levels and higher levels of economic development, economic freedom, democracy and female representation in government roles are more likely to comply with anti-human trafficking policies. To date, the majority of these studies have considered how these factors collectively and individually affect compliance with the policies, but have not explored how some of them can interact to have a different impact on country

compliance. Specifically, past studies have found that countries with lower corruption levels and greater economic freedoms are more successful in complying with anti-human trafficking policies. It is suggested here that the effect of corruption on a country's ability to adhere to anti-human trafficking policies is not necessarily independent of the country's economic freedoms and regulations. Barro (1996) and Knack and Keefer (1995) have found that economically free countries engage in more competition and generally have more open socio-economic institutions and practices. Logically, these more globally and socially open countries have an environment that is more conducive to enforcing and complying with government policies; especially those that focus on socio-economic issues such as human trafficking.

On the other hand, less economically free countries tend to suffer from inefficiencies and rigidities in their business and economic markets and institutions, making adherence to any government policy more challenging. While corruption has been found to hinder a country's ability to comply with anti-human trafficking policies, it is argued here that the effect of corruption in these two environments – economically free and economically restricted – is likely to differ. In economically closed countries, political leaders typically face significant barriers to effect change, which includes adhering to almost any policy or procedure. If corruption were to be widespread in this restricted environment, it would likely exacerbate the country's difficulties in complying with anti-human trafficking policies and efforts to reduce the amount of corruption in these environments is likely to have a significant, positive impact. Alternatively, while a reduction in corruption should also improve a country's ability to adhere to anti-human trafficking policies in an economically free country, the positive effect is not likely to be as substantial. Economically free nations have a structure and environment that is already more conducive to complying with anti-human trafficking policies and while a reduction in corruption should further assist in these efforts, it is likely not to have as significant an effect as a similar reduction in corruption in an economically restricted nation. Thus, it is hypothesized that the marginal effect of a reduction in corruption levels on a country's ability to comply with anti-human trafficking policies in an economically restricted country is greater than in an economically free nation. The primary thrust of this study is to conduct an empirical test of this relationship.

The remainder of the document is organized as follows. The next section discusses the relevant literature and findings related to corruption, economic freedom, and human trafficking. The Data and Methodology section provides a detailed description of the data used in this analysis. This section includes summary statistics and describes the methodology used to empirically test the hypothesis. The following section, Results and Discussion, presents the analysis results and discusses findings in relation to the primary research hypothesis presented in this study. Finally, the section Concluding Comments provides a brief overview of the study, which includes policy implications associated with the findings and offers possible avenues for future research.

LITERATURE REVIEW

Corruption has been used to describe a variety of behaviors such as bribery, collusion, coercion, kickbacks, and the abuse of authority for personal gain and can be found in both the public and private sectors (Aguilera and Vadera, 2008; Johnston, 1996; Hedienheimer, 1989; Van Klaveren, 1989; and Tanzi, 1998). As Tanzi (1998) notes, it can be difficult to define corruption; however, it is generally easy to recognize such practices if they are observed. Although the literature has not agreed on a single definition of corruption, there is considerable consensus regarding its negative impact on a country's institutions and infrastructure. As Shah (2011) discusses, corruption permeates almost every aspect of a society by weakening political systems, hampering economic development, and harming socio-economic factors such as the environment and the health of its citizens. Lambsdorff (2005) summarizes the considerable research that has shown the harmful effects of corruption on a country's total investment, GDP, institutional quality, government expenditures, poverty, and international flows of capital, goods, and aid. Further, the World Bank (2009) has identified corruption as one of the most significant

impediments in a country's economic and social development as it distorts the rule of law and weakens institutional foundations. In sum, a significant body of research has found that corruption systemically harms a country's markets, institutions, and infrastructure in addition to many socio-economic factors and generally weakens a country's ability to compete in the global economy (Kehoe, 1998; Jain, 2001; and Lambsdorff, 2005). Concerning human trafficking, a recent report by UNODC (2011) suggests that this crime and corruption are closely related.

While focusing primarily on corrupt behavior among law enforcers, criminal justice authorities and the private sector, UNODC documents findings consistent with the adverse impact of corruption on the enforcement of anti-human trafficking policies. Specifically, UNODC finds that "the corrupt behavior of law enforcers may help traffickers to recruit, transport and exploit their victims (p. 4)." Moreover, they find that corruption amongst criminal justice authorities may "obstruct the investigation and prosecution of cases, and/or impede the adequate protection of victims of the crime (p. 4)." Finally, the report argues that corruption in the private sector (e.g., travel agencies, hotels, etc.) may also diminish the impact of anti-human trafficking policies. The association between corruption and human trafficking has received increased attention in the press, as well as in the academic literature. For instance, in a recent CNN.com article on the U.S. State Department's decision to downgrade Thailand in its 2014 Trafficking in Persons (TIP) report, pervasive corruption in Thailand was cited as one of the contributing factors:

"According to the State Department, Thailand's efforts to address trafficking are being hampered by 'corruption at all levels.' Some corrupt officials have even protected brothels and food processing facilities from raids and inspections, the TIP report said. Police officers at the local and national level, who had been assigned to regions notorious for trafficking, formed protective relationships with traffickers. Immigration officials and police have allegedly sold migrants who were unable to pay labor brokers and sex traffickers, according to the report. (Brown 2014)"

Relatedly, the article also notes the State Department's view that Thailand officials have made little effort to address the claims of, or to adequately identify, victims of human trafficking, nor have they adequately responded to warnings from the State Department about the use of laws to prosecute those who report on human trafficking (Brown, 2014). The academic literature focusing on the effectiveness of anti-human trafficking policies has also examined the association between corruption and human trafficking. For example, after testing the association between several country-specific factors and the level of human trafficking activity, Zhang and Pineda (2008) conclude that corruption is likely most important factor in explaining human trafficking. They also conclude that countries exhibiting low levels of effort toward the enforcement of anti-human trafficking policies are also countries exhibiting higher levels of corruption. More recently, Cho et al. (2014) have found that compliance with anti-human trafficking policies significantly decreases when corruption is more prevalent.

Cho et al. (2012) note that the government's ability to enforce any policy depends at least to some extent on the quality of the government and the presence of corruption affects the quality and effectiveness of the government and the bureaucracy. In short, Cho et al. (2012) state that as corruption becomes increasingly prevalent, bureaucrats and government officials are less likely to protect and enforce sound policies, such as those outlined in the Protocol. Although past research has clearly found that a greater prevalence of corruption negatively affects a variety of socio-economic factors, including a country's ability to comply with anti-human trafficking policies, this negative effect is likely to be dependent on the level of economic freedom the country enjoys. The Heritage Foundation (2014) defines economic freedom as the right of to control one's own labor and property. Further, the Heritage Foundation describes an economically free society as one where citizens have the freedom to work, produce, consume, and invest as they chose and in which governments allow the freedom for labor, capital, and goods to move without restrictions or constraints. Past research has provided extensive evidence that greater economic freedom has many benefits. Specifically, in a cross-country study, Stroup (2007) finds

that economic freedom consistently enhances the health, education, and the ability to prevent disease within a country. Similarly, Esposto and Zaleski (1999) and Goldsmith (1997) find that countries with higher levels of economic freedom also enjoy a greater quality of life and better overall state of well-being. As discussed above, Barro (1996) and Knack and Keefer (1995) have noted that economically free countries are more likely to engage in global competition and tend to have more open socio-economic institutions and practices.

Economic freedom is also associated with greater efficiencies as Goel and Nelson (2005) note that less red tape and bureaucratic rigidities are found in economically free nations. Gartzke (2005) states that economically free nations have stronger international relationships that are developed through open trade and these relationships help foster cooperation across nations. In sum, there is significant evidence to suggest that economically free nations enjoy greater stability in their infrastructure and institutions, fewer bureaucratic rigidities, efficient markets, societies with improved overall well-being, and have stronger international relations. The characteristics of an economically free nation also serve to increase the likelihood for a country to comply with anti-human trafficking policies. Considering that economically free nations tend to have more open socio-economic institutions and practices and fewer bureaucratic rigidities and stronger international ties that encourage cooperation across nations, these nations are in a better position to adhere to international anti-human trafficking policies. Economically restricted countries with more closed socio-economic practices that are hampered with inefficiencies and lack the international relationships face considerable hurdles in complying with any international policy, especially those addressing human rights issues.

Thus, both economically restricted countries and those with a greater prevalence of corruption are challenged in their efforts to comply with international anti-human trafficking policies. When corruption is found to be widespread and is having a negative effect on a country, past research has often, suggested policies and procedures aimed to strategically reduce specific corrupt practices. While reducing corruption in any nation should yield many benefits, including the country's ability to comply to anti-human trafficking policies, efforts to reduce corruption in an economically restricted nation should have a larger marginal impact on its compliance with anti-human trafficking policies compared to a similar reduction in corruption in an economically free nation. A reduction in the prevalence of corruption should improve the transparency of laws, strengthen institutions, and enhance a country's overall social development and better position a country to adhere to international policies. Nonetheless, an economically restricted nation that suffers from a variety of bureaucratic rigidities, has weaker political systems, and more closed socio-economic practices is likely to observe larger boost in its ability to comply with anti-human trafficking policies compared to an economically free nation that already has an environment that is generally more conducive to adhering to such policies. In other words, reducing corruption in restricted nations should free some of the rigidities and inefficiencies and make laws and policies more transparent; all of which should better position these countries to comply with anti-human trafficking policies. On the other hand, reducing corruption in economically free nations that are already in a better position to adhere to such policies should also enhance their ability to comply, but the effect is not likely to be as significant. Thus, it is hypothesized:

H1: The marginal effect on the ability of a country to comply with international anti-human trafficking policies from a reduction in corruption level is greater for economically restricted nations compared to economically free countries.

DATA AND METHODOLOGY

Data measures for compliance with anti-human trafficking policies, corruption, economic freedom, and other control factors are needed to empirically test H1. Concerning anti-human trafficking, as noted above the Protocol outlines three distinct policy dimensions; Prosecution, Protection, and Prevention, to

fight human trafficking and these policies have been widely adopted in the international community. Specifically, the *prosecution* policy dimension measures governments' efforts to punish and prosecute traffickers on the six different policy areas outlined in the Protocol, while *protection* focuses on shielding and supporting victims, and *prevention* evaluates the level of government efforts to stop the occurrence of human trafficking. Using these three dimensions, Cho et al. (2012) develop a new anti-human trafficking index that measures governments' compliance on each of these dimensions. For each policy area, countries are scored on a discrete, one to five scale in which a score of five represents the greatest level of compliance and a score of zero indicates complete noncompliance.

The un-weighted sum of three policy dimension scores are then aggregated to create an overall index measure of a country's compliance with anti-human trafficking policies. This aggregate index (*3P*) is available for 175 countries. This measure created by Cho et al. (2012) offers the first anti-human trafficking compliance measure of its kind and the *3P* data is used to proxy country compliance with anti-human trafficking policies. Of the countries considered in this analysis, Australia, France, the Netherlands, South Korea, and Switzerland represent the countries with the highest *3P* data values as each received a perfect score of 15. On the other end of the spectrum, Syria, Iran, and Papua New Guinea represent countries with the smallest *3P* scores of 3, 4, and 5, respectively, indicating the lowest levels of compliance with the anti-human trafficking policies.

Concerning corruption, Transparency International's Corruption Perception Index (CPI) is used. According to Transparency International (2009), the CPI is designed to capture public sector corruption and is based on 13 different expert and business surveys that are completed both in country and abroad. The surveys ask respondents a series of questions related to the perceived level of abuse of public power for private benefit such as the degree to which bribes, kickbacks, and embezzlement occur. Each country receives a CPI score that is scaled from zero (highly corrupt) to 100 (minimal to no corruption). In 2009, 180 countries or territories received a CPI score. It should be noted that other country-level measures of corruption exist; however, Berg (2001) notes that the CPI is probably the most well known measure. Further, Lancaster and Montinola (1997) and Serra (2006) state that the CPI is the most complete corruption measure and is more robust than other measures that rely on single sources. Of the countries considered in this analysis, New Zealand, Denmark, Singapore, Sweden, and Switzerland represent the countries with the highest CPI values, or the lowest levels of perceived corruption, with scores of 9.4, 9.3, 9.2, 9.2, and 9.0. On the other end of the spectrum, Chad, Uzbekistan, Turkmenistan, Iran, Burundi, Haiti, and Guinea have the lowest CPI values of 1.6, 1.7, 1.8, 1.8, 1.8, 1.8, and 1.8, respectively, representing the countries with the highest levels of perceived corruption.

The Heritage Foundation's Index of Economic Freedom (*EFI*) is used in this study to measure country-level economic freedom. To create the index, the Heritage Foundation considers 50 different country-level variables that are divided into ten broad categories; Business freedom, Trade freedom, Fiscal freedom, Government spending, Monetary freedom, Financial freedom, Property rights, Freedom from corruption, Investment freedom and Labor market freedom (Heritage Foundation, 2014). The ten categories are scored individually and then averaged to create a country's overall economic freedom score. Thus, the *EFI* ranges from zero (least economic freedom) to 100 (greatest economic freedom). Compared to other measures of country economic freedom, Berggren (2003) notes that the *EFI* data has been used extensively in academic research. Of the countries considered in this analysis, Singapore, Australia, and Ireland represent the most economically free countries with 2009 *EFI* values of 87.1, 82.6, and 82.2, respectively. Alternatively, Zimbabwe, Venezuela, and the Democratic Republic of Congo represent the least economically free nations with *EFI* scores of 22.7, 39.9, and 42.8, respectively.

Finally, both income inequality and the level of economic development are used as control variables as both have been linked to human trafficking. Specifically, Bales (2007) finds that wealth, specifically, the overall economic well-being of a population and the extent of poverty, significantly impact the prevalence

of human trafficking in a country. The 2009 Gini coefficient developed by Corrado Gini in 1912 is used to measure income inequality. The Gini coefficient considers the income distribution in a country and captures the degree to which the distribution is unequal. The coefficient ranges from zero to one such that values close to zero represent an equal distribution of wealth and values close to one represent a highly unequal distribution. Lastly, the natural log of 2009 GDP per capita (LnGDPPC) measures the level of economic development, which is available through the World Bank.

Descriptive Statistics

The data described above is available for 140 countries and this sample is used to empirically test H1. Table 1 provides a summary of the data used as well as the descriptive statistics and Table 2 provides the correlation matrix. The 3P data used in the analysis is the most current data available and the control variables are lagged by approximately two years, as their effect on a country’s compliance with anti-human trafficking policies cannot be expected to occur immediately. Although each of the control variables are collected from the 2009 reported year, it is noted that not all the data from the various sources below is collected at the exact same time period during 2009, which will create some time periods in which the data collection is not perfectly synchronized.

Table 1: Variable Summary and Descriptive Statistics

Variable	Proxy (Name, Year Reported)	Mean	St. Deviation
Anti-Human Trafficking Policy Compliance	3P Index (Cho et al., 2012)	10.61	2.61
Corruption	Transparency International, Corruption Perceptions Index (CPI, 2009)	3.92	2.09
Economic Freedom	Heritage Foundation, Economic Freedom Index (EFI, 2009)	59.7	10.8
Income Inequality	Gini Coefficient (Gini, 2009)	40.57	9.27
Economic Development	LnGDP per Capita, World Bank (LnGDPPC, 2009)	7.62	1.58

Table 1 provides a summary of the variables in the analysis and their data proxies. As shown in Table 2, the 3P data is significantly and positively correlated with CPI, EFI, and LnGDPPC and significantly and negatively correlated with Gini, indicating that, as expected, countries with greater compliance with anti-human trafficking policies tend to have lower levels of corruption, greater economic freedom and development, and have a more equal distribution of wealth.

Table 2: Correlation Matrix

	3P	CPI	EFI	Gini	LnGDPPC
3P	1				
CPI	0.47***	1			
EFI	0.50***	0.83***	1		
Gini	-0.31***	-0.32***	-0.24***	1	
LnGDPPC	0.51***	0.82***	0.73***	-0.27***	1

Table 2 provides the Pearson correlation coefficient between each of the data variables used in the analysis. The significance of the correlations are defined as: *p <0.10; **p<0.05; ***p<0.01

Regression Analysis

To test H1, the following regression model, Model 1, is estimated:

$$3P = \beta_0 + \beta_1CPI + \beta_2EFI + \beta_3CPI * EFI + \beta_4Gini + \beta_5LnGDPPC + \varepsilon \tag{1}$$

In order to provide empirical support for H1, the estimated coefficients for β_1 and β_2 should be positive and significant and the estimated coefficient for the interaction term (β_3) should be negative and significant. Such results would indicate that, holding all else constant, lower levels of corruption and greater economic freedoms positively affect a country’s ability to comply with the anti-human trafficking policies outlined in the Protocol. Further, a reduction in corruption has a greater marginal effect on an

economically restricted country's ability to comply with the policies compared to an economically free nation.

RESULTS AND DISCUSSION

As shown in Table 3, the regression results provide overall support for Model 1 with an Adjusted R^2 of 0.3222 and a significant F at the 99% significance level. Concerning the coefficients on the control variables, the estimated coefficient on $Gini$ is negative and significant and the estimated coefficient on $LnGDPPC$ is positive and significant. This indicates that, as expected, wealthier nations with a more equal distribution of wealth have greater compliance with the anti-human trafficking policies outlined in the Protocol.

Table 3: Regression Results: Dependent Variable $3P$

	Coefficient Estimate	Std Err	T Stat	P-Value
<i>Intercept</i>	0.484	2.652	0.18	0.8556
<i>CPI</i>	1.406	0.751	1.87*	0.0634
<i>EFI</i>	0.1405	0.044	3.22***	0.0016
<i>CPI*EFI</i>	-0.0203	0.010	-2.11**	0.0366
<i>Gini</i>	-0.0504	0.021	-2.42**	0.0169
<i>LnGDPPC</i>	0.4446	0.208	2.14**	0.0343

Table 3 provides a summary of the regression results. The Adjusted R^2 for the regression is 0.3222 with an F test statistic of 14.22***. The significance of the estimates are defined as: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Most importantly, the estimated coefficients on CPI and EFI are positive and significant and the estimated coefficient on the interaction term is negative and significant, which offers empirical support for H1. By taking the partial derivative of the estimated regression with respect to CPI , the effect of a reduction in corruption can be examined in more detail. Specifically, the estimated marginal effect of CPI on $3P$ is:

$$\frac{\partial 3P}{\partial CPI} = 1.406 - 0.0203EFI \quad (2)$$

In the most extreme case, in which a country has no economic freedoms, EFI would equal zero. In this situation, the effect of a unit increase in CPI , which indicates a reduction in corruption, on a country's $3P$ index is estimated to be 1.406, holding all else constant. Alternatively, if a country had an average level of economic freedoms with the mean EFI value of 59.7, the effect of a unit increase in CPI would be 0.19409, a considerably smaller impact. Specially, the estimated effect is $0.19409 = 1.406 - (0.0203 * 59.7)$. Further, by solving the first order condition above, the estimated effect of unit increase in CPI in a more economically free country with an EFI value of 69.26 is approximately zero. In other words, holding all else constant, as the level of economic freedom within a country increases, the marginal effect of a reduction in corruption decreases, as theorized in H1.

The analysis raises an interesting result for economically free nations. In a very economically free nation, one with an EFI value greater than 69.26, the effect of a reduction in corruption is estimated to decrease a country's $3P$ score, or hinder a country's ability to comply with anti-human trafficking policies. For example, holding all else constant, the estimated marginal effect on $3P$ of unit reduction in corruption in an economically free country with an EFI value of 80 is -0.28. The negative impact of reducing corruption in highly economically free and developed nations is not new. As Jain (2001) describes, in some situations, corruption can 'grease the wheels' change. In more open and developed economies where resources are abundant and institutional rules are well-established and heavily regulated,

Swaleheen and Stansen (2007), Cuervo-Cazurro (2008), and Lui (1985) suggest that some degree of corruption can reduce some rigidities and transactions costs and improve efficiency. In this specific case, it is possible for a low level of corruption to facilitate transactions and enhance efficacy. Nonetheless, it should be noted that these situations are rare and that in almost every case, corruption has a harmful effect on a country's markets, institutions, infrastructure, and international relations in addition to its ability to comply with anti-human trafficking policies.

CONCLUDING COMMENTS

This study extends prior research concerned with the adverse impact of corruption on the effectiveness of anti-human trafficking policies. Specifically, we empirically test whether the association between corruption and overall compliance with anti-human trafficking policies varies with the extent of a country's economic freedom. Based on prior research suggesting that greater economic freedom is associated with factors that increase the likelihood of compliance with anti-human trafficking policies, we posit that efforts to reduce corruption in countries that enjoy greater economic freedom will have a smaller marginal impact on policy compliance compared to nations with lower levels of economic freedom. Using a sample of 140 countries during 2009, we find evidence to support our prediction. Specifically, our evidence suggests that the inverse relation between corruption levels and the extent of compliance with international anti-human trafficking policies is decreasing in the extent of a country's economic freedom. Our study provides several policy implications. In a recent report commissioned by UNODC (2011), corruption was identified as being highly interrelated with human trafficking; nevertheless, they argue, the lack of attention on the correlation between these two crimes has undermined efforts to develop and implement effective anti-human trafficking policies.

Our findings not only corroborate the UNODC's assertion that corruption and human trafficking are interrelated, but also shed light on the circumstances under which this relation is most prominent. That is, our findings suggest that efforts to reduce the extent of corruption, as a means of strengthening compliance with anti-human trafficking policies, would be better suited for countries with lower levels of economic freedom. An alternative interpretation of our results for policy-making purposes is that the promotion of stronger economic freedom may serve as a natural deterrent to corruption, which, in turn, will allow policy makers to redirect their anti-corruption efforts where they might be the most impactful in battling human trafficking crimes. While this study contributes to the growing body of literature examining the factors that affect a country's compliance with international anti-human trafficking policies, there are limitations to this study. Specifically, the measure of corruption used in this analysis is perceptions data that is primarily on survey data. It is widely recognized that survey data has inherent flaws as it is based on people's opinions and observations.

Further, the CPI data, as with all measures of corruption data, attempts to capture and measure a variable that is largely qualitative in nature. Nonetheless, as noted above, the CPI data has been recognized as one of the most complete and robust measures of country corruption available. Further, any data measure related to human trafficking is subject to question considering the hidden nature of the crime, the difficulties victims face in reporting the crime, and the general lack of public awareness of the crime. Thus, any data measure related to human trafficking should be considered in this light. Finally, this study offers avenues for future research. If leaders are successful in designing and implementing policies that effectively reduce corruption and/or bolster economic freedom, how do these changes affect a country's compliance with international anti-human trafficking policies over time? In other words, what is long-term impact of effective policies aimed to reduce corrupt practices and/or encourage economic freedoms and how do these policies affect compliance with anti-human trafficking policies over time? Such studies could consider the time lag between policy implementation and significant changes in compliance with anti-human trafficking policies. Considering the terrible nature of the human trafficking crime, more studies and international awareness are necessary tools to fight the crime. Almost by definition, this

crime crosses national boundaries and efforts to fight human trafficking need the collective buy-in from the global community as a whole. While globalization is likely to have contributed to the growth in human-trafficking, perhaps it can also serve to help fight it as the international community is more closely tied and connected than ever before.

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