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# LETTER FROM THE EDITORS

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and
Ismet Anitsal
Co-Editors
Tennessee Tech University

# BIOFUELS: WHAT IS ON PRACTITIONERS' MIND?

**Adee Athiyaman, Western Illinois University**

## ABSTRACT

*This research content-analyzed newspaper articles about biofuels to understand salient issues in the industry. Since practitioners possess greater knowledge of industry facts and experience: attributes necessary to identify industry and business-specific problems, we analyzed a sample of 535 news reports from managers in the biofuels industry. The living-systems theory was used as the conceptual model to classify news reports about biofuels. A major outcome of the research is the listing of study areas where research could help improve decision making in the biofuels system.*

## INTRODUCTION

The concept "biofuel" defines liquid fuels produced from organic, non-fossil material of biological origin such as crops, wood, and waste. Examples of biofuels include ethanol and biodiesel. In 2007, the US consumed 6.8 billion gallons of ethanol and 491 million gallons of biodiesel. Proportionally, this amounts to approximately 5% of the total consumption of motor gasoline and diesel in the nation (Energy Information Administration, 2008).

Recently, the Federal Government enacted the Energy Independence and Security Act of 2007 with the aim to increase biofuels consumption to 36 billion gallons by 2022. While this objective could help address issues such as rising oil prices, and greenhouse-gas emissions, experts believe that the "new energy solutions won't be cheap or easy" (Wall Street Journal's CEO Forum, November 24, 2008). For instance, the 3rd generation biofuel "Algae fuel" or "oilgac", costs $20 a gallon; a gallon of crude oil costs $0.90. Technology to produce enough algae to achieve price competitiveness is at least five to eight years away (Stein, 2009). Other concerns about biofuels range from land use: that is, displacement of food crops for fuel crops to consumer willingness to purchase energy-efficient technology (Duffy, 2005).

For applied disciplines such as business management, the Holy Grail is discovering answers to research questions that impact practice (Jacoby, 1985). From a knowledge creation perspective (for example, Rynes, Bartunek, & Daft, 2001; Merton, 1963), such inquiries could result in understanding uniformities in nature and society; that is, theory development. From a pragmatic viewpoint, addressing research questions relevant to practitioners (managers and public policy makers) could help them to legitimize courses of action.

In this paper, we content analyze newspaper articles on biofuels to highlight what practitioners "want to know about this source of renewable energy". Merriam-Webster defines

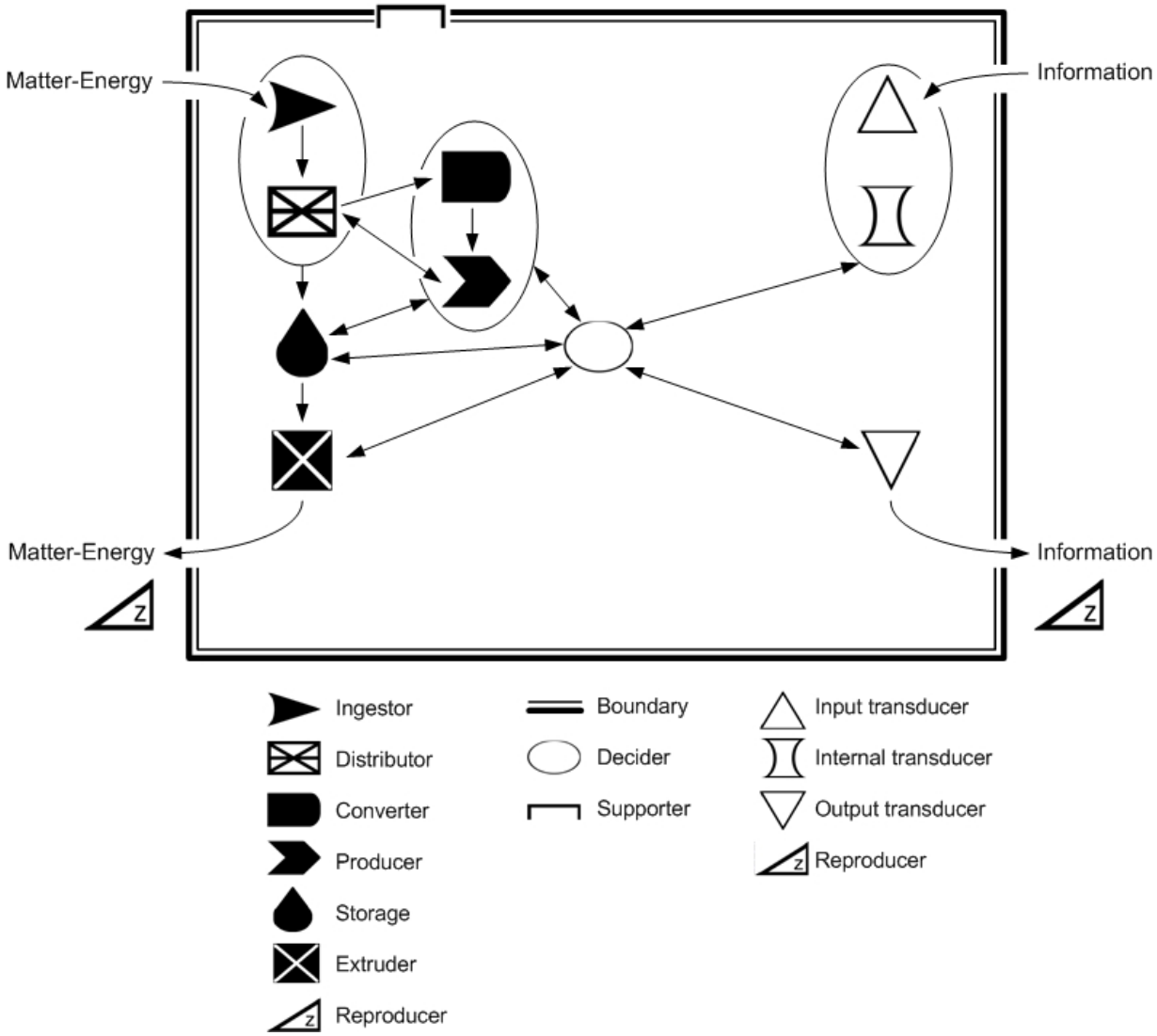
newspaper as a paper that is printed and distributed usually daily or weekly and that contains news, articles of opinion, features, and advertising (http://www.merriam-webster.com/dictionary/newspaper). Since practitioners possess greater knowledge of industry facts and experience: attributes necessary to identify business-specific problems, we limit our analysis to discussions from managers in the biofuels industry, including managers of biofuels research projects, and law makers. The focus on one media (newspaper) is based on the assumption that practitioners and law makers want the public to "see the world as they see it" (*proselytization* motive), and newspapers are the effective medium to achieve this (Krugman, 1965). Note that perceptual commonality is a necessary antecedent to achieving behavioral objectives such as political leverage and policy changes (Rossiter & Percy, 1997). The research questions that guided the analysis include: (i) what are the content characteristics of newspaper articles about biofuels; (ii) do the content differ among geographical regions, and (iii) what are the correlates of news reports about biofuels.

## CONCEPTUAL FRAMEWORK

The principles of categorization theory (Estes, 1994) suggest that concepts can be arranged into three-tier taxonomy: superordinate, basic, and subordinate levels. Renewable energy, defined as energy resource that is naturally regenerated over a short time scale and derived directly from the sun (for example, photoelectric), indirectly from the sun (for instance, wind), or from other natural movements and mechanisms of the environment (such as geothermal and tidal energy) (Texas Renewable Energy Industry Association, 2009), would be a superordinate category, biofuels would be a basic concept, and a specific form of fuel, say ethanol, would be the subordinate category. Systems at all these levels are open and composed of subsystems which process inputs, throughputs, and outputs of various forms of matter-energy, and information (Miller, 1978).

The extant literature on living systems theory (see for example, Caldwell, 2001; Miller & Miller, 1990) highlights a number of subsystems that are critical for any living system. Each subsystem performs a specific task for its system and keeps one or more specific variables in steady state. Collectively, the subsystems facilitate essential flows of matter-energy and information. In this study, we adapt this classification to categorize and analyze issues relevant for the biofuels system (Table 1 and Figure 1).

**Figure 1: Biofuels System: A Living Systems Perspective**

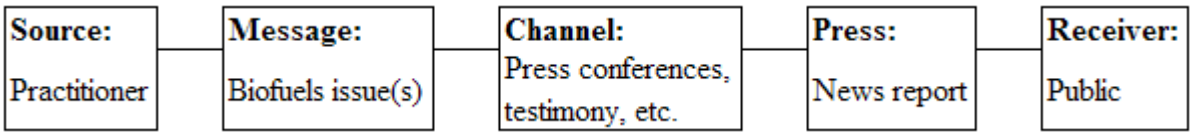



| Table 1: Biofuels Subsystems and their Functions | |
|---|---|
| Subsystem | Function |
| Reproducer | Produces new systems similar to the one it is in. |
| Boundary | Protects the components of the system from environmental stresses and filters entry to various sorts of matter-energy and information. |
| Ingestor | Takes in or consumes matter-energy from the environment. |

| **Table 1: Biofuels Subsystems and their Functions** | |
|---|---|
| Subsystem | Function |
| Distributor | Carries inputs from outside the system or outputs from its subsystem around the system to each component. |
| Converter | Changes certain inputs to the system into forms more useful for special processes of that system. |
| Producer | Allocates production tasks to different specialized units or industries. |
| Matter-energy Storage | Retains in the system deposits of various sorts of matter-energy. |
| Extruder | Transfers products and wastes out of the system. |
| Supporter | Facilitates interactions among components of the system. |
| Input Transducer | Brings information to the system. |
| Internal Transducer | Processes information about the functioning of the system and transmits that information to other relevant units. |
| Decider | Controls the entire system. |
| Output Transducer | Puts out information from the system. |

While the systems conceptualization enables classification of news reports about biofuels, the principles of communication theories and industrial organization economics facilitate hypothesizing about the antecedents of news reports (Figure 2). Specifically, we hypothesize about the effects of source factors (presenter characteristics), and message factors (for instance, utility of the message to audience) on newspaper publications about biofuels.

**Figure 2: A Graphical Model to Aid Hypothesis Testing**




Consider the source of the message. Often, readers of news reports grapple with the question, "who says so" (Hass 1981). One generally accepted proposition is that a source (presenter) in an authoritative occupation would command readers' attention (Stout & Moon 1990). If we conceptualize audience broadly to include the press, then we would expect the press to emphasize messages from individuals in authoritative occupations than messages from anonymous or "non-celebrity" presenters. Formally,

*$H_1$: The higher the occupational status of the presenter, the greater is the emphasis placed on her message.*

As regards the message itself, Bohle (1986) posits that newspapers tend to report bad news more than good news. An example of "bad" news would be increases in gasoline prices. Erfle and McMillan (1989) suggest that oil industry news coverage is likely to be large when prices are high. Hence the hypothesis,

*$H_2$: Gasoline price increases will be positively related to news reports about biofuels.*

The above reasoning suggests that decreases in gasoline prices will have a null or negative association with news reports about biofuels. However, since biofuels prices are linked to gasoline prices, and low gasoline prices could place the biofuels industry in financial difficulties, we expect a positive association between gasoline price decreases and news reports about biofuels. This leads to the hypothesis,

*$H_3$: Gasoline price decreases will be positively related to news reports about biofuels.*

The "channel" and "press" concepts in Figure 2 can be viewed as first-order factors or constituents of the "newsworthiness" concept (Shoemaker, 2006). Newsworthiness is often defined as the likelihood that a news story will be selected for publication (Kepplinger & Ehmig, 2006). Lacy, Fico & Simon (1988) contend that newspaper ownership affects the content of newspapers. Industrial Organization theory (for example, Cable, 1994) provides evidence that firms owned by large conglomerates experience reduced autonomy to pursue "local" interests. Applied to the problem at hand, a newspaper that is part of a conglomerate will place less emphasis on local news. In other words, the newspaper's conduct with respect to its product will be more national than regional. One plausible reason for this would be conglomerates' business practice of housing staff reporters in corporate headquarters. This cost-efficiency strategy often minimizes local news coverage and favors "standardized" national news reports (Wirth & Bloch, 1995). These arguments suggest that:

*$H_4$: Compared to independent newspapers, newspapers that are part of conglomerates or groups will publish less local biofuels-related news.*

Finally, for the receiver concept in Figure 2, our focus turns to a segment of audience that is of special interest to this research: the academic / researcher and her perceptions about researchable, biofuels issues. Specifically, we posit a link between news on a biofuels topic and published research on that topic. To elaborate, consider a scenario in which the extruder subsystem receives the least exposure or news coverage. This creates uncertainty for the researcher as to the relevance and usefulness of research on the topic. What the researcher needs is assurance that her research would benefit a number of practitioners. We posit that this assurance is conveyed by a large number of news reports on a topic. Thus,

*$H_5$: There will be a positive correlation between number of news reports on a biofuels topic and published research on the topic.*

## METHOD

The NewsBank database which provides full-text information from 600 US newspapers was searched for the keywords "biofuel and research problem". The need to study current issues and the timing and duration of the 2008 presidential campaign made us focus our analysis on news reports published during the time period February 10th 2007 to February 9th 2009. It is purposive sampling in that the selection is based on the assumption that practitioners will raise questions related to the energy needs of the nation during presidential campaigns to achieve desired ends such as policy changes (D'Alessio & Allen, 2000). The keyword search resulted in 2133 articles. Of these, 1298 were considered irrelevant for the study since they contained news such as the work experience of Steven Chu, the energy secretary (Krieger, 2008), and research grants related to biofuels (Gallagher, 2008). In addition, 300 news reports which were published in more than one source were removed from consideration, leaving 535 news reports for analysis.

The subsystems were operationalized by employing frequency counts to identify words of potential interest. These keywords were then used "in-context" to identify and classify articles to relevant subsystems. To illustrate, Table 2 contains examples of words that were mentioned in the articles that were analyzed. Of these, words that pertain to agricultural products or concepts such as corn, energy, food, fuel, and plant are of potential interest for identifying news about the ingestor subsystem (see for example, Sullivan, 2008). Similarly, words such as consumers, investments, markets, and price correlate with the boundary subsystem (Galbraith, 2008). Each article was first matched with the keywords pertaining to the subsystems, then screened by the authors using the keyword-in-context approach (Weber, 1990), and assigned to a specific subsystem.

**Table2: Examples of Words and their Frequency of Occurrence in the 535 Articles**

| Word | Frequency of Occurrence | Word | Frequency of Occurrence |
|---|---|---|---|
| Ethanol | 4113 | Fuel | 850 |
| Energy | 2789 | Gasoline | 840 |
| Corn | 2336 | Investments | 741 |
| Fuels | 2100 | Markets | 729 |
| Food | 2032 | Price | 712 |
| Prices | 1673 | Industry | 704 |
| Consumers | 1218 | Power | 667 |

| Table2: Examples of Words and their Frequency of Occurrence in the 535 Articles | | | |
|---|---|---|---|
| Word | Frequency of Occurrence | Word | Frequency of Occurrence |
| Research | 1103 | Water | 622 |
| Production | 1081 | Biofuel | 615 |
| Plant | 947 | Crops | 580 |

## Variable Definitions

To facilitate pattern analysis and hypothesis testing, a variety of information was collected for each of the 535 publications. The definitions of the variables follow the graphical model given in Figure 2.

### Source variables

- Occupation: The nominal measure had the following values: Business Manager = 1; University Researcher = 2; Industry Researcher = 3, and Law Maker = 4.
- Occupational status: Occupational status pertains to the power or social position associated with the occupation or job that a person holds. Operationally, it is the 0-100 occupational prestige score developed by Nakao and Treas (1994).

### Message variables

- Message emphasis: Prominence or importance given to the news as indicated by the number of words in the news report. The "word count" option in Microsoft Word was utilized to gather the information.
- Gasoline prices: Changes to the weekly, retail gasoline prices. Data were obtained from the official energy statistics of the US government (http://tonto.eia.doe.gov/dnav/pet/pet_pri_gnd_dcus_nus_w.htm).

### Press

- Press coverage about biofuels: Number of weekly newspaper publications on biofuels topics during the period February 10$^{th}$ 2007 to February 9$^{th}$ 2009. The NewsBank database was queried to construct the data vector.
- Newspaper market area: Geographical scope of circulation; applies to print version only. The nominal measure was constructed using the nine Census Bureau regions (http://www.census.gov/geo/www/us_regdiv.pdf). They include: New England = 1; Middle Atlantic = 2; East North Central = 3; West North

Central = 4; South Atlantic = 5; East South Central =6; West South Central = 7; Mountain = 8, and Pacific = 9.

- Local news: News about biofuels that occur within the market area of the printed newspaper. The categorical variable was coded 1 to represent news that occur within the market area and 0 otherwise. Data were obtained from the Editor and Publisher International Yearbook, 2008 edition.
- Newspaper ownership: Binary variable coded 1 to represent that the newspaper is owned by a public company or group (for example, The Washington Post) and 0 to indicate that it is owned by an independent publisher (for instance, The Arkansas Gazette). Data source: Editor and Publisher International Yearbook, 2008 edition.
- Frequency of publication: The number of times a newspaper is published during a week. The categorical measure had two levels: Daily publication = 1; Other = 2.

**Receiver**

- Published research on biofuels: Reports of original research on biofuels that have been published in the *Energy Policy* journal.

**Reliability and Validity Assessments**

A common definition of reliability for categorization is the ratio of coding agreements to the total number of coding decisions (Carletta, 1996). We use this approach but modify it to account for coding agreements that would be expected by chance (Perreault & Leigh, 1989):

$$I_r = \{ [(F_o/N)-(1/k)][k/(k-1)] \}^{1/2}$$

where,

$I_r$ is the reliability index which ranges from 0 (not at all reliable) to 1 (perfectly reliable);
$F_o$ = number of judgments on which the judges agree;
N = total number of judgments made by each judge, and
k = number of ways in which the coding could be done: 13 ways, see Figure 1.

As regards the validity of the content analysis, we explore the correlations among the source of research problems (for example, law maker) and relate it to the topic of discussions (for instance, food versus fuel debate). The theory is that law makers should be more concerned with ingestor and boundary issues (for example, the food-versus fuel debate) than issues related to the matter-energy storage subsystem (for instance, ethanol-compatible pipeline).

**Statistical Analysis of Data**

Other than correlation analyses and two-group t-tests involving hypotheses testing, the results of the content analysis are summarized using statistical procedures relevant for nominal variables (Lebart, Morineau & Warwick, 1984). In addition, we explore whether the research issues pertaining to biofuels exhibit any regularity like the one described by the Lotka's law (Bookstein, 1977; Cheung & Cox, 1990, 1994). Lotka's law is based on empirical generalizations derived from a two-dimensional plot of log-number of authors in the journal *Chemical Abstracts* and the log-number of contributions made by the authors. Symbolically, it is an inverse square law of the form

$$a_n = a_1/n^c, \text{ where n = 1, 2, 3 .....} \quad (1)$$

where, $a_n$ is the number of authors publishing *n* papers, $a_1$ is the number of authors publishing one paper, and *c* is a constant or parameter that needs to be estimated through empirical means. An empirical generalization of the law is that only few authors publish more than one paper in a journal. Equation 1 helps assess whether few authors from one or more industry publish the most biofuels-related research in *Energy Policy*. The test involves rewriting equation 1 as follows:

$$ln(a_n) = ln(a_1) - c\ ln(n) \quad (2)$$
$$ln(a_n) - ln(a_1) = -c\ ln(n) \quad (3)$$
$$ln\ (a_n/a_1) = \alpha - c\ ln(n) + e \quad (4)$$

If regression on equation 4 results in a null intercept: that is, calibrating equation 4 results in $\alpha = 0$, then it could be concluded that only few researchers regularly publish biofuels research in the journal. The level of such concentration could be gleaned from c.

## RESULTS

Two judges independently coded the 535 news reports. The results of the coding process revealed an 87% agreement between the coders (n= 465). Inter-coder reliability based on the Ir index works out to 0.89.

Earlier, we argued that the validity of the content analysis will be established by cross-classifying subsystem issues or topics with the source of the news report. Table 3 shows that the correlations between subsystem issues and sources of the issues are in the expected direction. For instance, practicing managers are concerned with information inputs to the system (input transducer issues). University researchers tend to be occupied with matter-energy storage issues.

Production problems and associated innovation issues (reproducer-subsystem topics) are dealt by industry researchers. Finally, as expected, law makers focus on boundary issues.

**Table 3: Correlations between Issues and Occupational Categories of the Persons Posing the Questions**

| | Business Managers (n=226) | University Researchers (n=145) | Industry Researchers (n=74) | Law Makers (n=85) |
|---|---|---|---|---|
| Reproducer | -0.77 | -0.11 | 0.97 | 0.96 |
| Boundary | -0.30 | -0.64 | 0.67 | 0.66 |
| Ingestor | 0.80 | -0.85 | 0.41 | 0.39 |
| Distributor | 0.72 | 0.20 | -0.94 | -0.93 |
| Converter | 0.21 | -0.94 | 0.22 | 0.20 |
| Producer | -0.81 | -0.06 | 0.98 | 0.98 |
| Matter-Energy Storage | -0.65 | 0.99 | 0.28 | 0.30 |
| Extruder | 0.62 | -0.99 | -0.23 | -0.25 |
| Input Transducer | 0.99 | -0.48 | -0.93 | -0.94 |
| Internal Transducer | 0.56 | 0.40 | -0.85 | -0.84 |
| Decider | -0.08 | 0.89 | -0.34 | -0.31 |
| Output Transducer | 0.86 | -0.02 | -0.99 | -0.99 |

Note: For n=100, the statistical significance of absolute correlation at the conventional $\alpha \leq 0.05$ works out to 0.40.

## News Reports about the Subsystems

Ingestor issues dominated biofuels news reports (51%), followed by producer (23%), and input transducer issues (7%). Some of the discussions include:

- assessing the efficacy of cordgrass, and switchgrass for ethanol production (an ingestor issue);
- estimating the market for used cooking oil for biodiesel production (input transducer), and
- highlighting the impact of biofuels production on nation's water resources (input / output transducer issue).

Other issues include, boundary issues such as profiling consumers who would be willing to pay premium prices for biofuels (boundary subsystem had a 5% frequency of mention); forecasting the category share of biofuels, electricity, and hydrogen fuel in the next 10 years

(internal transducer registered a 2% mention), and distributor topics such as gasoline retailers' evaluative criteria for installing biodiesel pumps at gas stations (5% frequency).

The subsystem issues tend to co-vary with one another; news reports about one of the subsystems co-occur with news about the other subsystems. As an example, consider the ingestor issue about feedstock availability to meet the 2022 federal-mandated production target of 16 billion gallons of cellulosic ethanol. This news tends to co-occur with the converter news about adapting plants' photosynthesis process to produce bio-energy. Table 4 shows the types of associations uncovered through the content analysis procedure.

**Table 4: Associations among the Subsystems**

| Correlated Subsystems | Associations |
|---|---|
| Ingestor ←→ Converter | Ingestor: Pine needles and wood chips can be used as fuel sources; Converter: How to break down woody or grassy biomass, efficiently, for cellulosic ethanol production? |
| Distributor ←→ Internal Transducer | Distributor: Would enough feedstock be available to meet the 2022 production target of 16 billion gallons of cellulosic ethanol? Internal Transducer: Can ethanol be stored in fiberglass tanks? |
| Extruder ←→ Converter | Extruder:Does cellulosic ethanol increase greenhouse-gas emissions? Converter: How does nature release plant sugars? |
| Input Transducer ←→ Output Transducer | Input Transducer: Mixed with glycerol, algae grow rapidly and are a good source of biofuels; Output Transducer: Is rising use of biofuels related to deforestation? |

Finally, an examination of the correlates of news stories reveals that:

- Newspapers print as 'features' (reports of around 1200 to 1500 words), issues about input transducer subsystem, extruder subsystem, converter, ingestor, and the boundary subsystems. In contrast, the 600-word 'news story' is the main communication platform for news about internal transducer, distributor, output transducer, and matter energy storage subsystems.
- Feature articles about biofuels tend to be the norm in the Pacific (for example, California), East North Central (for instance, Illinois), and West North Central states (Iowa, Kansas, Missouri, etc.). The reverse is true for Mountain states such as Colorado, and Nevada were news reports about biofuels tend to be around 600-word reports.
- Law makers prefer to disseminate information about biofuels in daily publications, and less frequently in biweekly, or weekly publications. Furthermore, they opt for medium-circulation vehicles (newspapers with 75,000 to 250,000 in circulation) to disseminate news reports about biofuels.

## Tests of Hypotheses

The hypothesis that higher the occupational status of the presenter, the greater is the emphasis placed on her message did not gain empirical support ($H_1$: r = -.12, p = .145). While gasoline price fluctuations do covary with news reports about biofuels ($H_2$: r = .726; p = .00; $H_3$: r = .61; p = .00), the hypothesis that, "localization is a phenomenon related to independent newspapers" could not be validated ($H_4$: $t_{\text{Mean Difference}}$ = 0.21; p >.05). Finally, the product-moment correlation between newspaper reports about biofuels and academic publications on biofuels topics did not differ from zero ($H_5$: r = -.03; p > .6).

### Lotka's Law Analysis

During the period January 2008 to November 2009, a total of 3,023 authors published biofuels related paper in the *Energy Policy* journal. Of these, 83% authored only one paper, 11% wrote two papers, and the remaining 6% penned more than two papers. This pattern of publication could be explained by the Lotka distribution (Eq. 1). In fact, as expected, we find a statistically significant slope parameter (-3.41769, p = $1.5288\times10^{-6}$), and a "null" intercept (0.348134, p = 0.370118). Table 5 provides details including the model fit.

**Table 5: Parameter Estimates**

| | Estimate | Std. Error | T | p |
|---|---|---|---|---|
| Intercept | 0.348134 | 0.363514 | 0.957692 | 0.370118 |
| Slope | -3.41769 | 0.230685 | -14.8154 | 1.5288×10-6 |
| $R^2$ | .964679 | | | |
| Prolific Authors | | | | |
| Seven Papers: | | | | |
| Arif Hepbasli, EGE University, Turkey | | | | |
| Aviel Verbruggen, University of Antwerp, Belgium | | | | |
| Subhes C. Bhattacharyya, University of Dundee, UK | | | | |
| Eight Papers: | | | | |
| Benjamin K. Sovacool, Virginia Polytechnic Institute and State University | | | | |
| Nine Papers: | | | | |
| Simon Shackley, The University of Manchester, UK | | | | |
| Ten Papers: | | | | |
| Ram M. Shrestha, Asian Institute of Technology, Thailand | | | | |

## DISCUSSION

The concept of eco-efficiency, that is, delivering more value for less environmental burden, has become the objective for the Obama administration. Some of the proposals for energy efficiency include: (i) generate 25 percent of electricity from renewable sources by 2025, (ii) set a cap-and-trade programs to reduce greenhouse gas emissions by 80 percent by 2050, and (iii) place 1 million plug-in hybrid automobiles on the road by 2015 (Environmental Leader, 2009).

Although businesses are aware that we could no longer maintain our global drive toward continuing economic growth without exhausting our finite resources, they struggle to address issues of operational significance that determine sustainability: for instance, replacing fossil fuels in production processes without affecting business profits. This is particularly true in biofuels production where, for example, production facilities face uncertainties in feedstock availability and selling prices. This economic uncertainty reduces business interests in biofuels production which in turn could undermine the national "eco-efficiency" objective. How could we help biofuels systems in this setting?

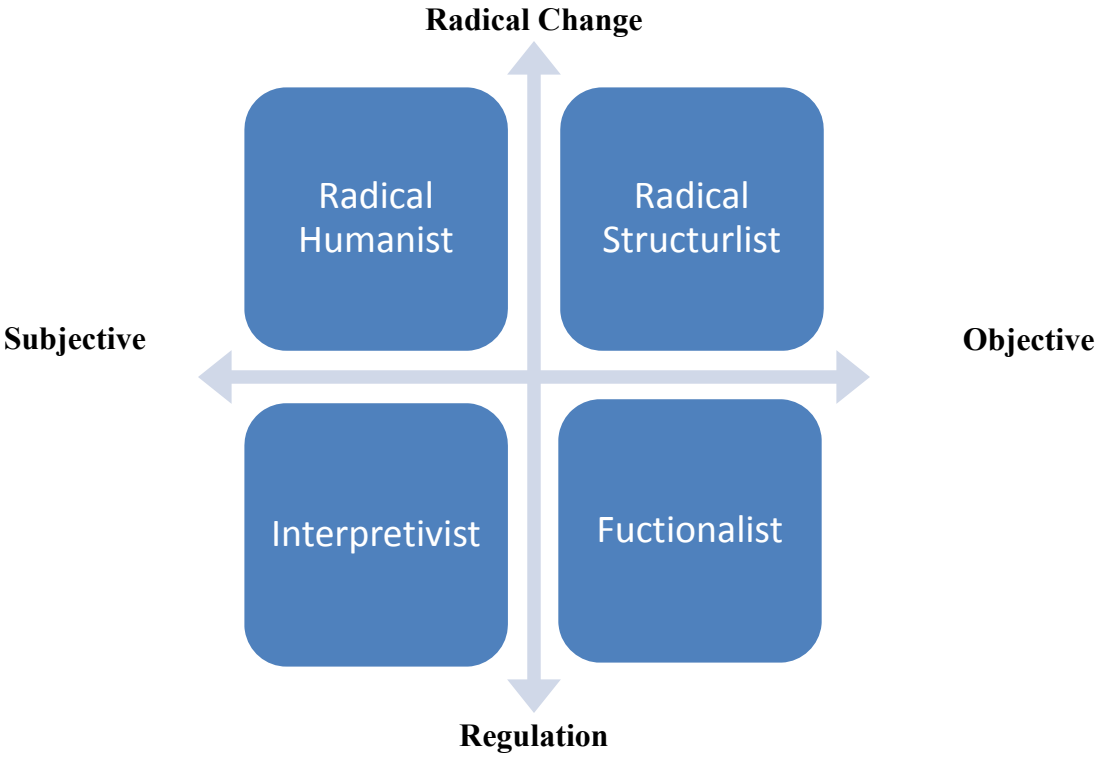
If one assumes that the operand (machinery utilized in biofuels production), and the operant (human knowledge and skills in operating the machinery) perform effectively, then the problem reduces to identifying "other" barriers in the system to creating stakeholder value. These, we believe, are the issues that we have identified using content analysis (see Appendix 1, discussions related to Table 6).

The issues, are more properly researchable topics, are broad statements that often specify relation between two or more variables. These statements could be made meaningful for research if they could be anchored on to a specific paradigm. Since research paradigms are based on assumptions about *ontology*, *epistemology*, and *methodology*, we utilize Burrell and Morgan's (1979) 2x2 matrix (Figure 3) to normatively prescribe paradigms that are relevant for addressing issues related to the subsystems.

The functionalist paradigm would view a concept as objective phenomenon that is external to, and independent of, the researcher and the subjects (Gioia & Pitre, 1990). For instance, the question, "how does corn ethanol compare to gasoline on emissions" would be addressed in a deductive manner, starting with reviews of the existing literature, setting up of hypotheses by specifying predictor variables, collecting data, and testing the association among predictor and criterion variables using quantitative methods.

In the subjective, interpretivist paradigm, the same question would be addressed from the perspective of the informant (for example, the chemists or scientists involved in fuel emissions research). Analysis begins by using coding procedures to discern patterns in the qualitative, interview data to establish categories or interpretive schemes about the issue.

**Figure 3: The Four Paradigms**




As regards the radical humanist paradigm, the question will still be addressed in an interpretive way, but with a "critical" stance. A major assumption of the paradigm is that power-holders (for instance, big businesses) influence perceptions about emissions that become part of "taken-for-granted" way of seeing. Here, the objective of research is to examine the legitimacy of social consensus on meaning, to uncover distortions, and to educate individuals about the ways in which distortions occur (Forester, 1983).

Finally, a radical structuralist would address the question, "how does corn ethanol compare to gasoline on emissions", by focusing on structural mechanisms that exist in the study area. These would include, for example, number of gas stations with E85 pumps, consumer attitude towards ethanol, etc. As in the case of humanist paradigm, the objective here is to examine the legitimacy of social consensus on meaning, and change it, if needed.

In summary, approaches to addressing research issues that concern the biofuels system should be grounded in appropriate paradigmatic assumptions. Table 6 categorizes ingestor issues using the paradigms given in Figure 4. Note that while the majority of the issues requires a functionalist viewpoint to study them, it could be beneficial for knowledge development purposes to utilize a multiparadigm approach to researching the issues.

| **Table 6: Paradigms to Theorize about Ingestor Issues** | |
|---|---|
| Issue | Relevant Research Paradigm |
| How does corn ethanol compare to gasoline on emissions?<br>Which plant species are most suitable for ethanol production?<br>What type of nonagricultural soils could support energy crops?<br>Are Pine needles and wood chips the most environmentally friendly materials that can be converted to fuel for cars and electrical grids?<br>Could jet fuel be produced from vegetable oil at a cost of $1 a gallon?<br>Would Jatropha crowd-out native species?<br>Can switchgrass be grown on mine sites stripped of top soil?<br>What contextual factors determine algae production? | Functionalist: Focus is on identifying and testing empirical relationships through causal analyses. |
| Farmers' attitudes toward growing pennycress.<br>Famers' beliefs about Jatropha plant.<br>What role prices play in farmers' decision to grow Jatropha rather than edible crops? | Interpretivist: Concerned with description and interpretation. |
| Would enough feedstock be available to meet the 2022 (federal mandate) production target of 16 billion gallons of cellulosic ethanol? | Radical Humanist: Focuses on social construction of reality in order to change. |
| Does ingesting change over geographical spaces?<br>Could catfish ponds be transformed into algae farms? | Radical Structuralist: Identifies sources of domination – liberation through structural analysis |

## CONCLUSION

This paper contributes to the literature by presenting a framework to understand the multifaceted nature of researchable issues or topics in biofuels, and delineating theory-building strategies to study the topics. It is now up to individual researchers to take up the challenge of providing insights into some of these issues.

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**Appendix 1**
**Potential Topics for Research on Biofuels**

Lundberg (1976) posits that research questions can be categorized into six basic forms:

What is an x?
X is asserted, is it so?
Where does x occur, what is the distribution of x?
What are the similarities and differences between $x_1$, $x_2$, …, $x_n$?
What is associated with x?
What causes x or what does x cause?

Note that addressing questions of the form 1 to 4 require descriptive research whereas forms 5 and 6 need explanations or explanatory research. In the following pages, we focus on salient issues that business managers, and law makers are concerned about (Table 3) and classify them using the six forms of questions.

**What is an x?**

Reproducer Issues:

What plants or feedstock of biofuels production can be grown in extreme environments (for instance, in the Great Salt Lake, and areas of great heat such as the geothermal vents in the Yellowstone National Park)?

**What are the technological barriers to constructing a mobile biofuels refinery that will process multiple feed stocks?**

Boundary Issues:

What is the image of ethanol among farmers?

Distributor Issues:

What are gas station operators' evaluative criteria for installing biodiesel pumps at gas stations?

**X is asserted, is it so?**

Boundary Issues:

How valid is the assertion that ethanol subsidies are responsible for food shortages around the world?

Converter Issues:
It is technologically impossible to break down woody or grassy biomass efficiently for cellulosic ethanol production. Is it so?

Internal Transducer Issues:

Is ethanol harmful for boats with fiberglass tanks?

**Where does x occur, what is the distribution of x?**

Boundary Issues:

What are the characteristics of home, biodiesel brewers? What kind of image do they convey about the biodiesel industry?

Ingestor Issues:

How could one identify abandoned farmlands and nonagricultural soils that could support energy crops?

Since any material containing hydrogen, carbon and oxygen could potentially be turned into motor fuel (for eg., plastics, construction debris, forest and lawn trimmings, wood chips, wheat straw and many other types of agricultural waste), what is the production scenario now?

Converter Issues:

What types of bacteria (for instance, Clostridium acetobutylicum) could be used to enhance butanol yields?

Extruder Topics:

How valid is the assertion that corn-grain and cellulosic ethanol increases greenhouse-gas emissions significantly when indirect land-use changes are taken into account?

Input Transducer Issues:

Is there a segment of consumers who would be willing to pay premium prices for biofuels?

**What are the similarities and differences between $x_i$?**

Boundary Issues:

What beliefs about alternative energy differentiate ethanol proponents from their opponents?

Input Transducer Issues:

What is the worldwide market for fuels made from food versus non-food crops?

**What is associated with x?**

Reproducer Issues:

How could one rank geographical areas in the US for their propensity to innovate?

Boundary Issues:

How harmful is ethanol production compared to gasoline production?

Ingestor Issues:

Does ingesting change over spaces? For example, in Asia, camelina may be the ideal crop for biofuels; in Australia, Mexico and parts of South America, it could be jatropha. Again, what are the contextual or structural factors that determine raw materials for biofuels?

Producer Issues:

What is the impact of biofuels production on the nation's water resources?

**What causes x or what does x cause?**

Boundary Issues:

What is the impact of the overall growth of the U.S. economy on biofuels margins or profitability and industry expansion?

Ingestor Issues:

What are the environmental and health costs of ethanol and how do they compare with gasoline?

Would enough feedstock be available to meet the 2022 (federal mandate) production target of 16 billion gallons of cellulosic ethanol?

Distributor Issues:

Assuming that enough feedstock would be available to meet the 2022 production target of 16 billion gallons of cellulosic ethanol, do we have adequate infrastructure capacity to handle that kind of an output?

Matter-Energy Storage:

An estimated 600,000 E85 vehicles zoom around California highways, but they have very few places to fill up E85, why?

Input Transducer Topics:

What per gallon price would make consumer switch to biofuels (the latitude of acceptance)?

Output Transducer:

How to facilitate the marine industry to adopt E10?

What influences, if any, would labels such as "100% Biomass Ethanol," "Grown on Marginal Lands," and "Corn-Free", have on public attitude towards ethanol?

Is rising use of biofuels related to deforestation?

# PARTICIPATING IN THE CONVERSATION: EXPLORING USAGE OF SOCIAL MEDIA NETWORKING SITES

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## ABSTRACT

*The use of social networks has risen dramatically over the last few years as users have reached out to friends, new acquaintances and businesses through this new means of communication. If firms are to successfully utilize social networks as a channel through which they reach their customers, they must fully understand the reasons that these customers choose to use social networks. Using the relationship between attitude and behavioral intentions established in the Theory of Reasoned Action and applied to technology use by the Technology Acceptance Model, this research examines constructs that influence consumer attitudes toward social networks and their intentions to use, continue using, and recommend social networks. The findings indicate that the level of enjoyment derived from using social networks is the strongest positive influence and that the drama associated with behaviors of others on the social network can be the strongest negative influence. These findings also show that the constructs of ease of use and usefulness made popular by the Technology Acceptance Model play no significant role influencing user attitudes or intentions with regard to social networks.*

## INTRODUCTION

In the last 10–15 years, use of social networking sites has exploded in the United States and globally. Users range from tech-savvy young adults to baby boomers and older adults seeking ways to reconnect with family and friends (Anderson, 2009). In this study, we examine one of the important user groups, college students, and their attitudes toward using social networking. Drawing upon the Theory of Reasoned Action, Theory of Planned Behavior, the Composite Model of Attitude Behavior Relations and the Technology Acceptance Model, we develop and test a model to explain college students' intentions to use social networking. Our findings shed light on factors that have contributed to the rapid increase in social networking.

Social media allows users to go from simply content consumers to content producers by publishing information. Kaplan and Haenlein (2010) define social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 [1], and that allow the creation and exchange of user generated content." According to Kaplan and Haenlein (2010) there are six types of social media: collaborative projects, blogs and

microblogs, content communities, social networking sites, virtual game worlds, and virtual social worlds. Our focus in this study is social networking sites, which are applications that enable users to connect by creating personal information profiles, inviting friends and colleagues to have access to those profiles, and sending e-mails and instant messages between each other Kaplan and Haenlein (2010).

Popular examples of social networking sites are MySpace (created in 2003) and Facebook (created in 2004). Facebook is ranked as the third most popular online brand in the world, with over 54% of the world's internet population visiting Facebook (Neilsen, 2010). In April 2010, social networking sites were visited by three-quarters of global consumers who went online, which is an increase of 24% over April 2009 (Neilsen, 2010). The average visitor spends 66% more time on these sites than a year ago, almost 6 hours in April 2010 versus 3 hours, 31 minutes in April 2009 (Neilsen, 2010). In July, 2010, Facebook surpassed having 500 Million users worldwide (Zuckerberg, 2010). It took the site about three months to climb from 300 to 350 million users and only about two months to gain another 50 million, then another three months to make it to 500 million. MySpace is still a top 10 website in the United States, with about 57 Million unique visitors and over one-quarter of the US internet population still interacting with MySpace on a daily basis (Prescott, 2010). Among college students, Anderson Analytics (Anderson, 2009) in their annual American College Student Survey found that Facebook was viewed as "cool" by 82% of males and 90% of females. According to Anderson, Facebook is the hands-down winner with the 18-25 year olds.

The following sections of the paper outline model development, methodology, results, and discussion.

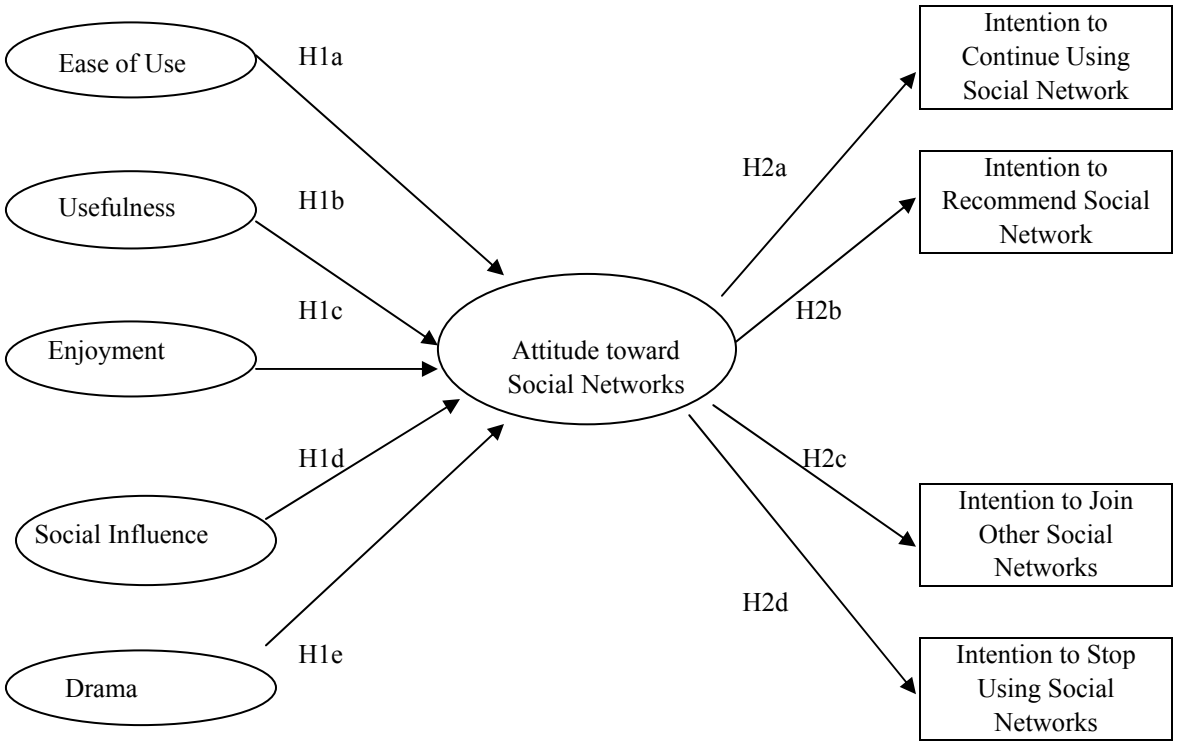
## MODEL DEVELOPMENT

We developed the model in Figure 1 to provide a framework for examining factors influencing consumer usage of social networks. Drawing upon the Theory of Reasoned Action (Ajzen & Fishbein 1980; Fishbein & Ajzen 1975), Theory of Planned Behavior (Ajzen 1991), and Composite Model of Attitude Behavior Relations (Eagly & Chaiken 1996), this model illustrates how beliefs are expected to influence a user's attitude toward a social network and how that attitude is expected to influence the user's intentions to engage in different social networking behaviors. A similar model, the Technology Acceptance Model and has proven useful in understanding consumer usage of technology (Davis, Bagozzi, and Warshaw (1989) and consumer usage of technology-based customer interfaces (Curran, Meuter, and Surprenant 2003; Curran and Meuter 2007).

## Antecedent Beliefs

The model includes five beliefs which are hypothesized to influence attitude toward the social network. These five beliefs are: ease of use, usefulness, enjoyment, social influence, and drama. Each of these factors is discussed more fully in the following sections.

**Figure 1: The Proposed Structural Model**




## Ease of Use

Ease of use has been defined as the degree to which a user would find the use of a particular technology to be free from effort on their part (Davis, Bagozzi and Warshaw 1989). This construct is central to the Modified American Customer Satisfaction Model which has been used to study technology (Tung, 2010). Ease of use is also important in the technology acceptance model (Davis, Bagozzi and Warshaw 1989) and has been used in many studies since (Awa, Nwibere & Inyang, 2010; Bagozzi, 2007; Thompson, Compeau & Higgins, 2006; Kuo, et al., 2005; Igbaria, Guimaraes and Davis 1995; and Taylor and Todd 1995). Therefore, it is hypothesized:

*H1a: Perceived ease of use of the social network will be positively related to attitude toward the social network.*

**Usefulness**

Usefulness is the subjective probability that using the technology would improve the way a user could complete a given task (Davis, Bagozzi and Warshaw 1989). Usefulness is the second central construct for the technology acceptance model (Davis, Bagozzi and Warshaw 1989), and has also received a great deal of attention in adoption literature (Bell, 2009; Choi, Lee and Soriano, 2009; Kamis, Koufaris and Stern 2008; Igbaria, Parasuraman and Baroudi 1996; Jackson, Chow and Leitch 1997; Taylor and Todd 1995). Therefore, it is hypothesized:

*H1b: Perceived usefulness of the social network will be positively related to attitude toward the social network.*

**Enjoyment**

Curran and Meuter (2007) showed that enjoyment can be an important influence in the adoption of a self-service technology. Dellaert and Dabholkar (2009) found that enjoyment was enhanced when using an on-line mass customization process. Eighmey and McCord (1998) identified enjoyment as a key construct in consumer patronage of websites. Wolfinbarger and Gilly (2001) provided qualitative evidence that fun was an important desired outcome when choosing to use technology to shop. Koufaris (2002) found enjoyment to be an important direct antecedent to intentions to return to an online retailer, while Sun (2009) found enjoyment to be an important antecedent of retention. While research has shown that people will use technologies because they are more pleasurable, fun, or entertaining than more traditional ways of doing things, more work is needed to clarify its place in understanding social network adoption. Therefore, it is hypothesized:

*H1c: Perceived enjoyment of the social network will be positively related to attitude toward the social network.*

**Social Influence**

Social influence relates to the approval or disapproval of others when the consumer decides to adopt and use products and services. The idea that people will purchase goods or services primarily to make a favorable impression on other people has been documented in many different contexts. For example, Steenkamp and Gielens (2003) found that social influences can have a pronounced negative effect on the chances of new product trial as products are perceived as more novel. Trocchia and Janda (2002) show that consumers may cease to use a product

because usage may not portray them to others in the fashion desired. Yoh, Damhorst, Sapp, and Laczniak (2003) showed that people who had more social support for Internet shopping had greater intentions to purchase on line. Howcroft, Hamilton and Hewer (2002) found that an important factor in consumer adoption of banking was the recommendation of a friend or family member. Agarwal, Animesh and Prasad (2009) showed that social influence helps to explain internet usage. Boyd (2008) states that the popularity of sites like MySpace among young adults is due to the "sociality" aspect. Therefore, it is hypothesized:

*H1d: Perceived social influence to use the social network will be positively related to attitude toward the social network.*

**Drama**

Focus groups conducted in the preliminary phases of this research revealed a recurring theme that some users of social networks engaged in dramatic reactions to social network postings and behaviors. These focus groups also provided evidence that some social network users will engage in behaviors online that they would not ever consider if they were face to face with others from the social network. Boyd (2008) found that the simple act of listing who were best friends versus next best friends on MySpace created pure social drama. When discussing how to enhance creativity in the workplace Burke (2009) recommends that using mainstream social networking sites, such as Facebook simply has too much drama. Thelwall, Wilkinson and Uppal (2010) found that MySpace is an extraordinarily emotion-rich environment, with 86% of the comments they researched in MySpace containing some type of emotion. According to Thelwal et al. (2010, p. 198), "… emotion is apparently the norm in social networking sites." They conclude, "MySpace users should not be afraid of emotional statements: These are the norm." Therefore, it is hypothesized:

*H1e: Perceived level of drama found on the social network will be positively related to attitude toward the social network.*

**Attitudes and Intentions**

An attitude is defined as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken 1993, p.1). In fact, research regarding the relevance of attitudes has found that attitudes, and ultimately behavioral intentions, develop sequentially or in a hierarchical fashion (Eagly & Chaiken 1993). The notion that attitudes influence behavioral intentions (Ajzen & Fishbein 1980; Fishbein & Ajzen 1975) has been researched extensively and this relationship has been well established in the marketing literature in areas such as loyalty (Auh, Bell, McLeod, and Shih, 2007), advertising (Karson and

Fisher, 2005), and technology adoption (Curran, Meuter, and Surprenant, 2003). Given the support for this attitude-behavioral intention relationship, the following relationships are hypothesized:

*H2a: Attitudes toward a social network will positively influence intentions to continuing to utilize social networks.*

*H2b: Attitudes toward a social network will positively influence intentions to recommend that social network to others.*

*H2c: Attitudes toward a social network will positively influence intentions to join other social networks.*

*H2d: Attitudes toward a social network will positively influence intentions to stop using some social networks.*

## METHODOLOGY

The primary objectives for this study are to develop and test the proposed structural model (Figure 1) and the hypothesized relationships. In order to complete this effectively, a survey approach was utilized targeting frequent users of Social Media. The survey consisted of 56 questions, seven of which were demographic, the rest covering respondents' feelings, opinions and intentions related to Social Media.

The survey was administered to students enrolled in various business courses at two campuses of a major US southeastern university over a two month period. Each potential respondent was given the option of completing the questionnaire or opting out of it.

### Sample

A convenience sample of 495 useable questionnaires was collected. 55.6% of the respondents were male and 44.4% were female. Respondents ranged in age from 18 to 64 with 61% being 22 years of age and under. 40% of the respondents use social networks several times each day, 24.1% use social networks once each day, and another 17% characterize their use of social networks as a few times each week. 94.7% of the respondents use Facebook, 64.9% of the respondents use MySpace, 19.7% of the respondents use Twitter, and 8.1% of the respondents use LinkedIn.

### Independent and Dependent Variables

The five independent constructs (ease of use, usefulness, enjoyment, social influence, and drama) were all measured using multiple item scales utilizing a seven-point Likert structure with

the endpoints being "strongly disagree" to "strongly agree." The exact items used can be seen in Table 2. The attitude construct was measured using a three-item, seven-point bipolar semantic differential scale with endpoints of good/bad, like/dislike, and pleasant/unpleasant (Curran, Meuter & Surprenant 2003; Allen, Machleit & Kleine 1992; Dabholkar 1996). Behavioral intentions were measured using single-item, semantic differential measures for each behavior with the end points being "extremely likely" and "extremely unlikely."

## RESULTS

The model proposed in Figure 1 was tested using structural equation modeling and several criteria are used to assess the overall fit of the models. The first criterion is the ratio of the chi square value to the degrees of freedom for the model, also referred to as the normed chi-square. Although there is some debate about the acceptable value of this ratio, it is generally held that a value between 1 and 3 is desirable (Hair, Black, Babin, and Anderson 2010) and anything above 5 would indicate a poor fit for the model (Marsh & Hocevar 1985; Kline 2005). The second criterion to evaluate fit is the comparative fit index (Bentler 1990), which is an incremental fit index and should have a value larger than .90 (Hair, Black, Babin, and Anderson 2010) and approaching .95 (Hu & Bentler 1999) in order for the model to be deemed reasonable. The third criterion of model adequacy is the root mean square error of approximation (RMSEA), which is based on a population discrepancy function. A RMSEA value of .05 or less would indicate a close fit of the model in relation to the degrees of freedom, while .08 or less would indicate a reasonable level of error of approximation and any model with a RMSEA above .10 would be unacceptable (Browne & Cudeck 1993).

### The Measurement Model

A measurement model was constructed to determine the correlations among the constructs included in the model and assess the convergent and discriminant validity of the various constructs. The fit of the correlation model was good with a Chi-Square value of 310.576, degrees of freedom of 137, and an acceptable ratio Chi-Sq/df of 2.267 (Marsh & Hocevar 1985). The CFI for this model is .975 and the RMSEA is .051, and both are indicative of good fit (Hu & Bentler 1999; Browne & Cudeck 1993). Table 1 shows that a total of 15 correlations were calculated and two correlations were greater than 0.5.

The average variance extracted was calculated for each of the six multi-measure constructs. Fornell and Larker (1981) wrote that the average variance extracted for each construct should exceed 0.5 to establish convergent validity. The average variance extracted for each of the constructs can be found in Table 2, each exceeded the 0.5 threshold and thus convergent validity is established. In order to examine discriminant validity, it is necessary to compare the squared correlations between each pair of constructs with the average variance

extracted for the individual constructs in each pair. If the average variance extracted for both constructs in the pair exceeds the square of the correlation between them, discriminant validity is demonstrated (Fornell & Larker, 1981). These conditions were met for every pair of constructs and discriminant validity is established.

**Table 1: Correlations Between Constructs**

| Construct | Attitude | Ease of Use | Usefulness | Enjoyment | Drama | Social Influence |
|---|---|---|---|---|---|---|
| Attitude | 1.00 | | | | | |
| Ease of Use | .362*** | 1.00 | | | | |
| Usefulness | .500*** | .274*** | 1.00 | | | |
| Enjoyment | .804*** | .438*** | .582*** | 1.00 | | |
| Drama | -.071ns | .149** | -.063ns | -.024ns | 1.00 | |
| Social Influence | -.019ns | -.138** | .234*** | .080ns | -.011ns | 1.00 |

Note: *: p < .05; **: p < .01; ***: p < .001; ns: not significant

**Table 2: Measurement Model Results**

| | *Internal Consistency* | | | |
|---|---|---|---|---|
| *Construct and Scale Items* | *Standardized Loadings* | *Composite Reliability* | *Coefficient Alpha* | *Average Variance Extracted* |
| **Attitude** | | .906 | .903 | .764 |
| Overall, how good or bad do you feel about being a member of this social network? | .855 | | | |
| Do you like or dislike being a member of this social network? | .924 | | | |
| How pleasant or unpleasant is your time spent using this social network? | .842 | | | |
| **Ease of Use** | | .940 | .940 | .839 |
| Learning how to participate in a social network was easy for me. | .887 | | | |
| I find social networks easy to use. | .928 | | | |
| It was easy for me to figure out how to participate in social networks. | .931 | | | |
| **Usefulness** | | .895 | .895 | .739 |
| Social networks make it easier for me to keep up with issues that interest to me. | .880 | | | |

| Table 2: Measurement Model Results | | | | |
|---|---|---|---|---|
| | *Internal Consistency* | | | |
| *Construct and Scale Items* | *Standardized Loadings* | *Composite Reliability* | *Coefficient Alpha* | *Average Variance Extracted* |
| Social networks make it easier for me to keep up with businesses that interest to me. | .807 | | | |
| Social networks improve the way I keep up with things that interest me. | .892 | | | |
| **Enjoyment** | | .943 | .941 | .807 |
| I enjoy keeping up with people using social networks. | .799 | | | |
| It's fun to be involved with social networks. | .944 | | | |
| I enjoy being part of a social network. | .962 | | | |
| I find social networks to be entertaining. | .878 | | | |
| **Social Influence** | | .772 | .734 | .543 |
| I participate in a social network because someone I know wants me to. | .532 | | | |
| I joined a social network to fit in with a group of people. | .933 | | | |
| I am part of a social network because friends would think less of me if I was not | .693 | | | |
| Drama | | .760 | .759 | .514 |
| People write things on social networks that they would never say face to face. | .674 | | | |
| People get too emotional about things that are put on social networks. | .778 | | | |
| There is too much drama dealing with people on social networks. | .696 | | | |

## The Structural Model Comparison

In order to fully understand the data that was collected a series of three nested structural models were evaluated to see which provided the best explanation of the hypothesized relationships. The first model tested was a non-moderated model in which all of the independent constructs included are assumed to directly influence the dependent variables without any moderating influence from the attitude construct. The second model is the hypothesized model in which the attitude construct moderates all influences that the independent constructs have on each of the dependent variables and the independent constructs have no direct effects on the

dependent variables at all. The third and final model will examine a combination of effects from the first two models where the dependent variables will be influenced by both attitude as a moderating construct and directly by each of the independent constructs. The fit indices for all three models can be seen in Table 3 and the paths values for each model can be seen in Table 4.

**Table 3: Comparison of Model Fit Measures**

| | Direct Effects Only Model | Moderated Only Model | Moderated & Direct Model |
|---|---|---|---|
| Chi Square | 1262.589 | 871.334 | 786.736 |
| Degrees of Freedom | 204 | 215 | 195 |
| Chi Square/df | 6.189 | 4.053 | 4.035 |
| CFI | .865 | .916 | .924 |
| RMSEA | .102 | .079 | .078 |
| Variance Explained($R^2$): Attitude | - | .702 | .663 |
| Variance Explained($R^2$): Continue to Use | .349 | .364 | .360 |
| Variance Explained($R^2$): Recommend | .408 | .435 | .426 |
| Variance Explained($R^2$): Join Other | .167 | .143 | .168 |
| Variance Explained($R^2$): Stop Using | .099 | .063 | .114 |

### Model 1 (Direct Effects Only)

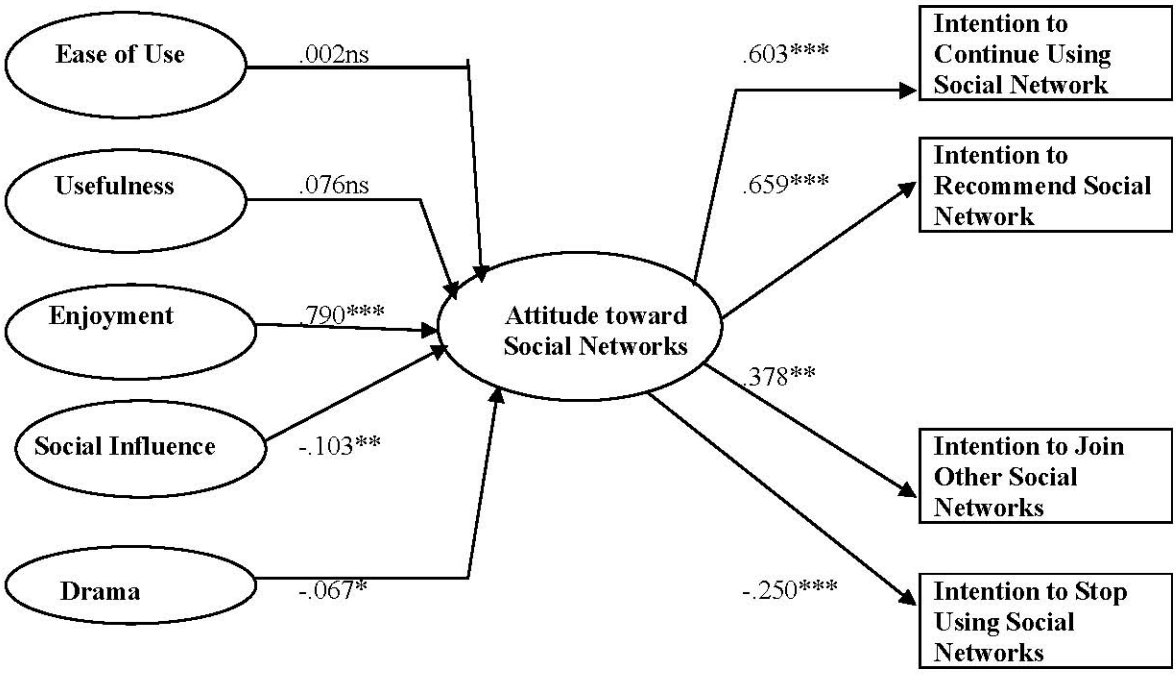
The first model tested contained only the direct effects from the five independent constructs to the four dependent variables and the attitude construct plays no role at all. The Chi-Square for this model is 1262.589, the degrees of freedom are 204 and this results in a ratio Chi-Square/df of 6.189 which is well above any acceptable limit for this model to be acceptable (Marsh & Hocevar 1985). The CFI value is .865, which is below the minimum level of acceptability for this index of .90 (Hair, Black, Babin, and Anderson 2010). The Root Mean Square Error of Approximation (RMSEA) was found to be .102, which also exceeds the .10 limit for acceptability (Browne & Cudeck 1993). Given that none of these fit indices are within acceptable limits, it can be concluded that the direct effects only model does not represent an acceptable explanation for the relationship among these constructs and variables.

| **Table 4: Comparison of Model Paths** | | | |
|---|---|---|---|
| | Direct Effects Only Model | Moderated Only Model | Moderated & Direct Model |
| Ease of Use to Attitude | - | .002ns | .000ns |
| Usefulness to Attitude | - | .076ns | .073ns |
| Enjoyment to Attitude | - | .790*** | .770*** |
| Social Influence to Attitude | - | -.103** | .097** |
| Drama to Attitude | - | -.067* | -.046ns |
| Ease of Use to Continue | .035ns | - | .047ns |
| Ease of Use to Recommend | -.054ns | - | -.043ns |
| Ease of Use to Join Other | -.053ns | - | -.047ns |
| Ease of Use to Stop | -.060ns | - | -.063ns |
| Usefulness to Continue | -.037ns | - | -.060ns |
| Usefulness to Recommend | .095ns | - | .071ns |
| Usefulness to Join Other | .096ns | - | .089ns |
| Usefulness to Stop | -.045ns | - | -.029ns |
| Enjoyment to Continue | .565*** | | .312*** |
| Enjoyment to Recommend | .576*** | - | .305*** |
| Enjoyment to Join Other | .338*** | - | .230** |
| Enjoyment to Stop | -.130* | - | .058ns |
| Social Influence to Continue | -.175*** | - | -.123** |
| Social Influence to Recommend | -.127** | - | -.075ns |
| Social Influence to Join Other | .058ns | - | .083ns |
| Social Influence to Stop | -.047ns | - | -.075ns |
| Drama to Continue | -.116** | - | -.093* |
| Drama to Recommend | -.157*** | - | -.133** |
| Drama to Join Other | -.087ns | - | -.077ns |
| Drama to Stop | .242*** | - | .227*** |
| Attitude to Continue | - | .603*** | .306*** |
| Attitude to Recommend | - | .659*** | .331*** |
| Attitude to Join Other | - | .378*** | .123ns |
| Attitude to Stop | - | -.250*** | -.235** |
| Note: ***: p<.001; **: p<.01; *: p<.05; ns: not significant | | | |

**Model 2 (Moderated Effects Only)**

The moderated effects model is a direct test of the model that was shown in Figure 1 where the independent constructs all influence attitude toward the social network and attitude is the only influence on the dependent variables representing behavioral intentions. The results for the moderated effects model can be seen in Figure 2. For this model the Chi-Square is 871.334 and the degrees of freedom are 215, yielding a ratio Chi-Square/df of 4.05. The ratio is within the desirable range of 1 to 5 to demonstrate acceptable performance (Marsh & Hocevar 1985). The CFI value is .916, which is above the minimum level of acceptability of .90 (Hair, Black, Babin, and Anderson 2010). The Root Mean Square Error of Approximation (RMSEA) was found to be .079 which is within acceptable limits (Browne & Cudeck 1993). The combination of these results demonstrates that this is an acceptable model.

**Figure 2**
**The Moderated Only Structural Model**




Note: *: p < .05; **: p < .01; ***: p < .001; ns: not significant

In this model, 70.2% of the variation in attitude toward the social network is explained and three of the five hypothesized relationships with antecedent factors were found to be

significant. The significant paths were from Enjoyment to Attitude (.79, p<.001), Social Influence to Attitude (-.103; p<.01), and Drama to Attitude (-.067; p<.05). All of the paths from Attitude to the four behavioral intention variables were significant at p<.001. The standardized coefficients for the paths were .603 for the path from Attitude to Intention to Continue, .659 for the path from Attitude to Intention to Recommend, .378 for the path from Attitude to Join other Networks, and -.25 for the path from Attitude to Intention to Stop Using Some Social Networks. This model explains 36% of the variation in Intention to Continue Using the Social Network, 44% of the variation for Intention to Recommend Social Networks to Others, 14% of the variation for Intention to Join Other Social Networks and 6% of the variation for Intention to Stop Using Some Social Networks. These results support hypotheses H1c, H1d, H1e, H2a, H2b, H2c, and H2d. Hypotheses H1a and H1b are not supported.

**Model 3 (Moderated and Direct Effects)**

The final model combines all of the paths that were included in the other two models, both direct from the independent constructs to the dependent variables but also the paths through the attitude construct. The significant results for this model can be seen in Figure 3. The Chi-Square for this model is 786.736 and the degrees of freedom are 195, yielding a ratio Chi-Square/df of 4.035 which is acceptable (Marsh & Hocevar 1985). The CFI value is .924, which is above the minimum level of acceptability of .90 (Hair, Black, Babin, and Anderson 2010) and closer to the desirable level of .95 (Hu & Bentler 1999). The Root Mean Square Error of Approximation (RMSEA) was found to be .078 which is again within acceptable limits (Browne & Cudeck 1993). These results demonstrate that this is an acceptable model. A comparison of the Chi-Square ($\Delta$Chi-Square = 84.598) and Degrees of Freedom ($\Delta$df = 20) for this model and the Moderated Effects Model shows that this Combination Model is significantly better at explaining this data than the Moderated Effects Model.

There are a number of differences in the significant paths between the Moderated Effects Model and the Combination Model. There are only two paths that significantly influence Attitude in this model and those paths are Enjoyment (.770; p<.001) and Social Influence (-.097; p<.01) and only 66.3% of the variation in Attitude is explained. The path from Drama to Attitude was not significant in this model as it was in the Moderated Effects Model. Attitude is significantly related to only three of the four dependent variables in this model where it was related to all four in the Moderated Effects Model. The significant paths in this model were from Attitude to Intention to Continue (.306; p<.001), from Attitude to Intention to Recommend (.331; p<.001), and from Attitude to Intention to Stop Using Some Social Networks (-.235; p<.01). The path from Attitude to Intention to Join other Networks was not significant in this model.

Several of the direct paths from the independent constructs to the dependent variables were also found to be significant and this model explains 36% of the variation in Intention to Continue Using the Social Network, 43% of the variation for Intention to Recommend Social

Networks to Others, 17% of the variation for Intention to Join Other Social Networks and 11% of the variation for Intention to Stop Using Some Social Networks. None of the direct paths from Ease of Use or Usefulness to any of the dependent variables were found to be significant. The direct paths from Enjoyment to Intention to Continue Using the Social Network (.312; $p<.001$), Intention to Recommend Social Networks to Others (.305; $p<.001$), and Intention to Join Other Social Networks (.230; $p<.01$) were all found significant. Three of the direct paths from Drama to the dependent variables were found to be significant and those paths were to Intention to Continue Using the Social Network (-.093; $p<.01$), Intention to Recommend Social Networks to Others (-.133; $p<.01$), and Intention to Stop Using Some Social Networks (.227; $p<.001$). The direct path from Social Influence to Intention to Continue Using the Social Network (-.123; $p<.01$) was the only direct path from Social Influence to be found significant.

## DISCUSSION

The comparison of the three nested structural model clearly demonstrates that the best explanation for this data is offered by the model that contains a combination of direct and moderated effects on the behavioral intentions related to social networks. The combination model shows that there are significant direct and indirect effects on intentions to use social networks, intentions to recommend social networks, and intentions to stop using social networks. Including the direct paths had a particularly dramatic effect on the variance explained for Intention to Stop Using Social Network as the Drama construct had a strong direct effect on this dependent variable. The variance explained for the other variables and construct remained comparable between the two better fitting models.

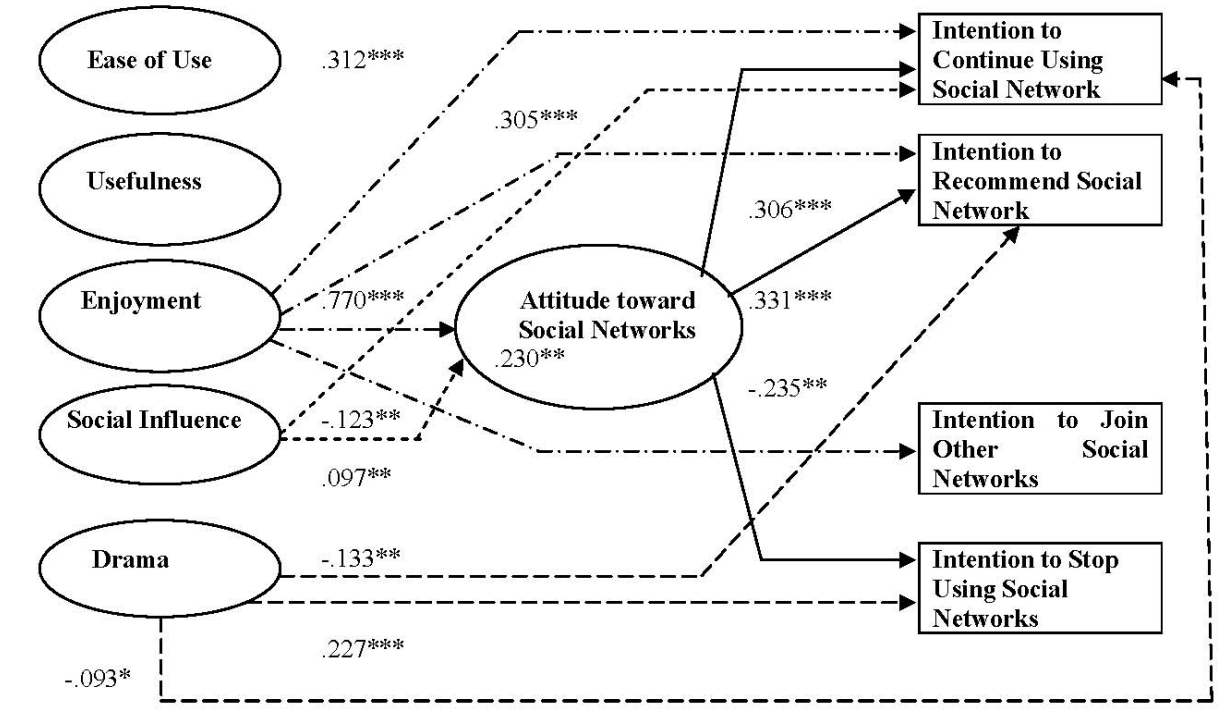
In our research, we found that enjoyment is the strongest factor influencing Attitude and has a significant direct effect on Intention to Continue Using Social Networks, Intention to Recommend Social Networks, and Intention to Join Other Social Networks. There can be little doubt from these results that social network users derive a great deal of enjoyment from the use of social networking and it would be critical for anyone seeking to use social networks to reach out to others of interest to them to be keenly aware that if the experience they provide on the social network is less than enjoyable they may be disappointed with the outcome.

Social Influence has a significant positive effect on Attitude and a significant but a negative influence on Intentions to Continue Using Social Networks. This can be interpreted as social network users feeling positive about being part of the network but disliking the pressure they may feel to use it beyond their level of comfort.

Drama has no direct effect on Attitude but it does have significant and negative influence on Intention to Continue Using Social Networks and Intention to Recommend Social Networks. There is also a strong positive effect on Intention to Stop Using Social Networks. These results show that social network users do not like certain behaviors from others with whom they connect through social networks and these behaviors may result in a termination of use of the network

not just the individual relationship. Most of the research on social networking does not look at this particular factor, therefore, this is a very interesting finding that could have major implications for marketers.

**Figure 3**
**The Moderated & Direct Effect Structural Model**
(Only significant paths shown)




Note: *: p < .05; **: p < .01; ***: p < .001

Interestingly from a theoretical perspective, the two constructs that formed the foundation of the Technology Acceptance Model, namely Ease of Use and Usefulness, were not found to have a significant relationship with any of the dependent constructs in any of the models tested in this research. This may indicate that social network users are no longer concerned about the functionality of the technology itself but more concerned with the outcomes derived from its use.

## ENDNOTE

[1] Commonly associated with web applications that facilitate interactive sharing and collaboration on the World Wide Web.

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# MEASURING THE VALUE OF INGREDIENT BRAND EQUITY AT MULTIPLE STAGES IN THE SUPPLY CHAIN: A COMPONENT SUPPLIER'S PERSEPCTIVE

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## ABSTRACT

*Purpose: The goal of this article is to conceptualize the Ingredient Branding strategy and propose tools for measuring value derived from brand equity at the component supplier's perspective. We demonstrate how brand equity occurs and how it can be measured at three marketing stages: B2B, B2C and B2B2C.*

*Design/methodology/approach: This paper characterizes different stages in the Ingredient Branding strategy. Furthermore, the paper provides a different measurement method for each stage, and highlights in the end, an overall view of all participants in the Ingredient Branding value chain.*

*Findings: We show first that measuring brand equity at the end user stage alone is not as useful as measuring brand equity at multiple stages of the value chain. The complexity associated with an Ingredient Branding strategy makes it a multi-stage branding and marketing effort. Therefore, various data and measurement tools are needed to meet the needs of marketing managers and scholars focused on brand strategies for differing stages of the value chain. We demonstrate that existing brand measurement methods can be modified to analyze multi-stage, interrelated exchanges.*

## INTRODUCTION

In today's fast-changing markets, Ingredient Branding is becoming a major marketing strategy as demonstrated by the increasing number of products sold with embedded branded components (Prince and Davies 2002; Cooke and Ryan 2000; Washburn, Till, and Priluck 2004). Despite its success in generating positive effects on participants in the value chain (for examples see Kotler and Pfoertsch 2006), the effects of Ingredient Branding in business markets has been generally overlooked in terms of brand equity (Desai and Keller 2002; McCarthy and Norris 1999; Norris 1992; Rao, Qu, and Ruekert 1999; Venkatesh and Mahajan 1997; Havenstein 2004; Pfoertsch and Mueller 2006; Kotler and Pfoertsch 2006). This work aims to shed light on understanding Ingredient Branding strategies, and suggests valuation tools for assessing brand equity from the component supplier's perspective.

The purpose of this paper is to introduce measurement instruments that enable managers to determine that value of Ingredient Brand equity at various stages of the value chain, a practice that should be beneficial for both B2B and B2C managers and scholars (Mudambi 2002; Gregory and Sexton 2007; Beverland, Napoli and Lindgreen 2007; Webster and Keller 2004; Lynch and de Chernatony 2004; Anderson and Narus 2004; Kotler and Keller 2006). The benefits of understanding and measuring value derived from Ingredient Brand equity at various stages of the value stems from the ability of high equity brands to generate opportunities for successful extensions, resilience against competitors′ promotional pressures, and barriers to competitive entry (Aaker 1991, 1992; Kotler and Keller 2006; Farquhar 1989). It is not known however whether companies that rank high in brand equity – such as Intel, Tetra Park, Shimano or Dolby - (Interbrand 2006) derive value from brand equity at the original equipment manufacturer (OEM) stage, at the consumer stage, or at both stages. Traditional measures and values of brand equity focus only on next-down dyadic stages in the value creation process.

In this study, we build on the notion that component suppliers are typically Business-to-Business (B2B) companies with an OEM as a consumer brand extension. We assert that Ingredient Branding is a much more complex strategy than the strategy that most would think a B2B branding should be. This complexity requires component suppliers, as well as other firms in the value chain, to gather in-depth information from the various participants of the value chain as well as from the final customer for managing and responding to this strategy appropriately. To address these managerial needs, we extend existing marketing theory by demonstrating the need for a more complex measurement tool that accounts for brand equity as it affects interactions across multiple stages in a value chain.

The remainder of this paper proceeds as follows: First, an overview of existing Ingredient Branding research is presented. Then, stages that are important to an Ingredient Branding strategy are defined and described. Next, measurement instruments are proposed to evaluate success at each of these stages. This leads to the assertion that fruitful stages for Ingredient Branding strategies include the B2B dyadic relationships between the component supplier and the OEM, the B2C stage between the OEM and the end user, and the B2B2C stage representing traditional communications for Ingredient Branding between component supplier and end user. We outline conclusions and provide an outlook for further research.

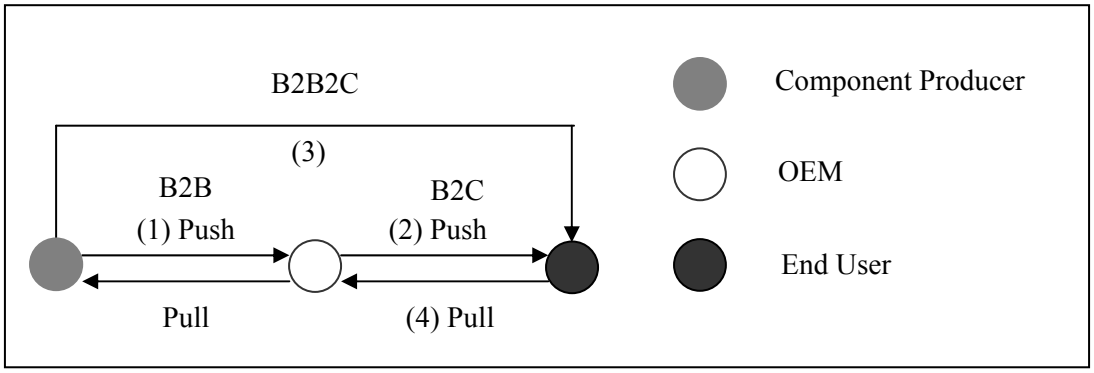
## INGREDIENT BRANDING

Ingredient Branding is a particular type of alliance between two products, based on both firms' cooperation in designing and delivering the product, with particular emphasis on consumer recognition and identification of components in the final product (Pfoertsch and Mueller 2006). In other words, Ingredient Branding can be conceptualized as a B2B branding strategy between a manufacturer and a supplier in which the end product of the supplier becomes one of the aspects of the manufacturer's strategic concept (Ervelles et al. 2007). Ingredient

Branding occurs when a branded elementary product or service is embedded within an end product that is promoted to the final user.

The motivation behind Ingredient Branding revolves around the ingredient, or component, forming an alliance with a product manufacturer in an effort to create brand awareness for the Ingredient Brand to generate pull effects with the final consumer through the value chain (Pfoertsch and Mueller 2006; Havenstein 2004).The push and pull concept is crucial to understanding Ingredient Branding and the motivations behind it. The push strategy involves directing the marketing strategy toward the original equipment manufacturers. A pull strategy involves appealing directly to the consumer. One implication of this view is that the marketing mix for an Ingredient Branding strategy involves both push and pulls effects: Consumer behavior creates pull and manufacturer behavior creates push. To demonstrate, consider push and pull effects as effects of marketing mix decisions. Supporting pull with push increases the probability of coordination. The combination of the push and pull creates synergy for the complete marketing mix. The supplier offers a component or service to his customer, the OEM. Thus, the supplier has a B2B relationship with the producers of such products as automobiles and electronic products. The OEM produces a product that is to be used by their customer, the final user. The final user buys the product or service in a pure B2C relationship with the OEM. According to this principle, there are two separate stages of customer relationships: supplier with OEM, OEM with final user (see Fig. 1). In Ingredient Branding, the two stages are related in the following way: Step (2) follows step (1), and step (3) occurs when the supplier informs the final user that a particular ingredient is part of the final product offering and the final user chooses this product over competitive offerings. In step (4), the final customer "pulls" the product because the particular ingredient component is desired. This is a continuous process of push and pull with a high success rate if done appropriately (Luczak et al. 2007).

**Figure 1: The Ingredient Brand Framework**




The notion of Ingredient Branding (Pfoertsch and Mueller 2006) is one of many brand strategies (McCarthy and Norris 1999; Norris 1992) articulated in marketing (for a summary, see

Bengtsson 2002; Kotler and Pfoertsch 2006). In recent years however, its prominence and importance have increased dramatically. Examples of Ingredient Branding campaigns include "Makrolon, the High-Tech Polycarbonate" or "100% Cotton", which are campaigns to create brand awareness about ingredients – in this case computer chips or materials – that are contained within final consumer products. Ultimately, ingredient popularity among consumers drives demand for products and/or services that contain the branded ingredient. It has been argued that this demand then influences firms in the middle of the value chain to use these ingredients in their products or services. As a result, Ingredient Brands have been known to change the way that firms interact in the value chain (Anderson and Narus 2004; Luczak et al. 2007).

Marketing literature is inundated with studies investigating how Ingredient Brands function at the consumer level (Desai and Keller 2002; McCarthy and Norris 1999; Norris 1992; Rao, Qu, and Ruekert 1999; Venkatesh and Mahajan 1997). Why this branding strategy has positive effects has been shown in several other empirical studies (Rao and Ruekert 1994; Park, Jun, and Shocker 1996). Generally speaking, manufacturers and suppliers benefit through mutual co-operation, endorsement of each other's offerings, shared knowledge and capabilities, risk sharing, trust and shared experience. Often, an identified advantage of Ingredient Branding for component suppliers may be reducing ease of entry of competitors (Pfoertsch and Mueller 2006; Havenstein 2004). On the other side, manufacturers may enjoy a jointly enhanced market reputation. In return for the reduced probability of potential competitive entry, suppliers may reward manufacturers with a lower price. In turn, suppliers may lower costs through having a stable, long-term customer and through economies of scale (Bengtsson and Servais 2005). Another advantage focuses on the cost of the branded B2B offering which can potentially be lower due to the elimination of double marginalization resulting in lower prices for the customer. As seen in the case of Intel advertising support (Kotler and Pfoertsch 2006) the supplier helps in the marketing of the product by the manufacturer. In some cases, cash-based advertising support from the supplier to the manufacturer is passed on to the buyer in the form of lower prices (Pfoertsch and Mueller 2006). Furthermore, Ingredient Branding has been used to maximize utilization of an organization's brand assets, generate new revenues, enter new markets, create barriers to entry from competitors, share costs and risks, increase profit margins, and widen current markets (Rao and Ruekert 1994; Park, Jun and Shocker 1996).

All these advantages capture the brand value of Ingredient Branding (Aaker 1991). Among other things, this brand value can be expressed in monetary value. Existing brand literature offers various measurements of brand equity, as discussed in the following section.

## MEASURING INGREDIENT BRAND QUITY: AN OVERVIEW

Ingredient Branding is said to have started in the chemical industry (e.g. DOW Chemical with Styron, BASF with Luran). It is possible that the first application may have occurred in the early 60's when target products were plastics and synthetic fibers. Initial scholarly studies of

Ingredient Branding followed within the next few years (Corey 1962; Bergler 1963, 1968; Hertzberg 1963; Schmitt 1969; Koelbel and Schulze 1970). Marketing slogans such as "Made of Owens-Corning Fiberglas" or carpets with Stainmaster's "Always stylish, always beautiful" originated in this period.

At this time, branding strategy was defined either as an "exception" from an attribute-oriented branding strategy (Sellert 1927; Etmer 1959; Kainz 1961; Pentzlin 1973) or as an "exception" from a reaction-oriented branding strategy (Berekoven 1961; Thurmann 1961). Norris (1992) provides the initial definition that is still used today (Baumgarth 1997; Smit 1999; Freter and Baumgarth 2005; Kleinaltenkamp 2001; Havenstein 2004; Unger-Firnhaber 1996; Wiezorek and Wallinger 1997; Baumgarth 1998; Kemper 2000). Most works about Ingredient Branding are theoretical-descriptive (Simon and Sebastian 1995; Bugdahl 1996; Freter and Baumgarth 1996; Kemper 1997; Esch and Stein 2001), and empirical-quantitative studies are scarce (Havenstein 2004; Saunders and Watt 1979; Vaidyanathan and Brown 1997; Venkatesh and Mahajan 1997; Baumgarth 1998; Simonin and Ruth 1998; McCarthy and Norris 1999; Janiszewski and Van Osselaer 2000; Janiszewski, Kwee and Meyvis 2001; Van Osslelaer and Janiszewski 2001; Desai and Keller 2002).

Outcomes of Ingredient Branding research have generally supported success of Ingredient Branding strategies. U.S.-based research focuses on food components such as Chiquita Bananas in infant food or Heath candy bars in ice cream. In European research, there is a focus on chemical products and technically oriented components. Examples from the automotive industry are the center of attraction.

A short characterization of research on Ingredient Branding research can be summarized with the following four attributes:

- Concentration only on select and specific questions (industry-specific)
- Out of touch with reality and factious brand and product offerings
- Limited validity due to the use of primarily university students as participants
- Research primarily concentrated on consumptive commodities (e.g. food)

Most studies focus on success and risk factors. Most include empirical analysis of products with branded ingredients compared to identical products without branded ingredients. Often, primary data utilizing survey and questionnaire data are collected (e.g. conjoint analysis) (McCarthy and Norris 1999; Havenstein 2004). Sometimes, case studies or expert interviews are used (Kotler and Pfoertsch 2006; Pfoertsch and Mueller 2006). More recently, aspects of the Service-Ingredient-Branding framework are assessed (Burmann and Weer 2008; Bruhn 2008). It should be noted that services as brand relevant components of total performance are of particular interest. Of the existing studies, however, most overlook an explicit differentiation between B2C oriented vs. B2B oriented ingredient branding strategies.

## RELEVANT STAGES FOR MEASURING THE VALUE OF INGREDIENT BRANDS

As seen in Fig. 1, the component supplier offers a product to the OEM (B2B). The OEM uses the component to produce the end product and sells the end product to the end user (B2C). At the same time, the component supplier communicates advantages of the component for an end product to the end user (B2B2C). It is critical that Ingredient Brand valuation captures the pull effect, resulting from the end user preference in this scenario. Most studies often focus solely on the OEM/end user stage and, as a result, success from the perspective of the component supplier at the B2B stage is overlooked. To appropriately allocate value to an Ingredient Branding strategy, it is necessary to include the network of all up-stream markets, beginning with the component supplier and culminating with the end customers. By taking this approach, it becomes necessary to broaden the analysis of exchange beyond dyads and include those exchanges that occur within larger networks of firms. In marketing, these sets of firms have been referred to as distribution channels, value chains, embedded markets, network markets, or, simply, networks (Coughlan et al. 2001; Vargo and Lusch 2004; Wathne, Biong and Heide 2001; Frels, Shervani and Srivastava 2003; Wilkinson 2001). The key to this perspective is that the firms are interrelated because they are all involved in bundling ingredients into final products or services for consumption by an end consumer (Coughlan et al. 2001), and exchange in one dyad is affected by exchange in another dyad (Money, Gilly and Graham 1998; Wuyts, Stremersch, and Van Den Bulte 2004). This notion of interrelatedness has been the canter of many studies (Wathne and Heide 2004; Achrol, Reve and Stern 1983; Bagozzi 1975).

## MEASURING INGREDIENT BRAND EQUITY AT MULITPLE STAGES

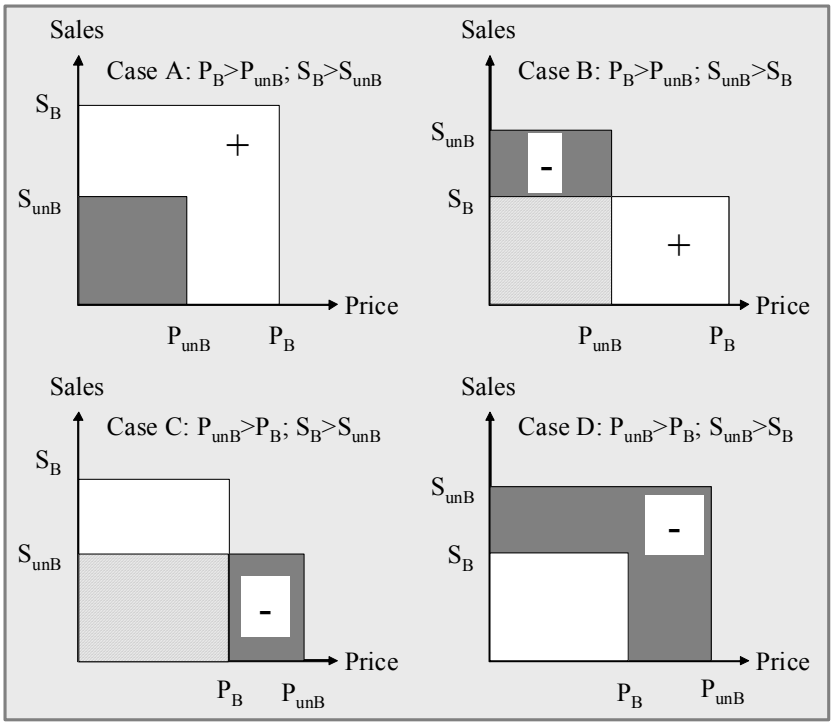
As mentioned above, at the B2B stage, brand equity provides value for the component supplier at the supplier-OEM stage (Mudambi 2002; Beverland, Napoli and Lindgreen 2007; Webster and Keller, 2004; Lynch and de Chernatony 2004; Anderson and Narus 2004; Kotler and Keller 2006). Value at the B2B stage is heightened when there is extraneous support from a consumer pull effect (because customers will demand end products containing the branded component). When an OEM demands the branded component in response to consumer pull effects, the final step of a *successful* Ingredient Branding strategy is achieved. Because this stage represents the point where component suppliers (who have initiated the Ingredient Brand strategy) can reap the most economic benefits, it is recommended that the measurement of brand equity be isolated at this stage.

Brand equity is derived from customer willingness to pay a price premium for a branded product when compared to the price of an identical unbranded product (Subrahmanyan 2004). The price premium, as a result of brand equity, becomes a source of value for the firm (Aaker 1991, 2003; Kotler and Pfoertsch 2006; Sattler 2001). As a result, the component supplier is able to ask for higher prices with a branded component compared with an identical component

that is not branded. Conversely, it may sometimes be the case that increased sales of a component improves brand equity. In these situations, brand building is seen as an investment and increases in marketing expenditures, communication costs and other brand building activities should generate increased prices and/or sales (Sattler 1997). Based on previous studies, we define "revenue-premium" as the price premium ($P_B$) multiplied by sales premium ($S_B$) (Ailawadi, Lehmann and Neslin 2003).

The combination of price premium and sales premium can be beneficial in four ways (Fig. 3). In the best case scenario (Case A in Fig. 3), the component supplier achieves a price premium (where $P_B$ = price of branded product and $P_{unB}$ = price of unbranded product) as well as a sales premium ($S_B$ = sales of branded product, $S_{unB}$ = sales of unbranded product). In Case B, $P_B$ is higher than $P_{unB}$ but at the same time $S_B$ is lower $S_{unB}$. The benefit for the component supplier in this case is the difference between the positive effect of $P_B$ (+) and the negative effect of $S_B$ (-). In case C, $S_B$ are higher than $S_{unB}$ but at a lower price level. In the worst case scenario (Case D), there are both lower prices and lower sales of the branded component compared to an identical component without a brand.

**Figure 2: Possible Constellation for Price and Sales Premium**




Data to measure price and sales premium are typically available from most companies via panel data. Another way to collect data is on the basis of individual survey and/or interview.

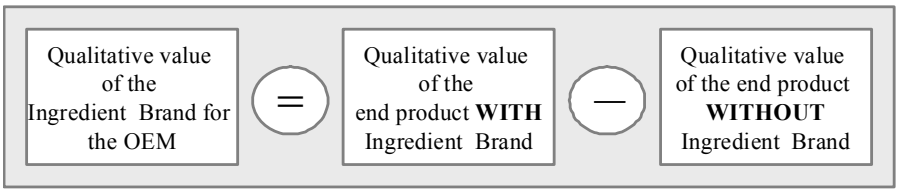
Often, self-explicated models or conjoint analyses are used to find out the willingness to pay for a special branded product compared to an unbranded one (Sattler 2001, Havenstein 2004).

## UNDERSTANDING WHERE VALUE RESIDES FOR OEMS IN AN INGREDIENT BRAND STRATEGY

OEMs pursue various goals when labeling components in their products. Differentiation from competitors (Kotler and Pfoertsch 2006; Venkatesh and Mahajan 1997), security from substitution (Norris 1992), realization of price premiums (Rao, Qu, and Ruekert 1999; Kotler and Pfoertsch 2007), reduction of marketing costs (Bengtsson and Servais 2005) or production / research / development costs are only a few possible advantages.

However, these various advantages stem from the same source: consumer preference for an end product that contains the branded component (Rao and Ruekert 1994; Park, Jun and Shocker 1996). Extending these results, we argue that this preference becomes salient when consumers are asked to express their preference for an end product with a branded component versus an end product without the same branded component (fig.3).

**Figure 3: Qualitative Value of Ingredient Branding from the OEM Point of View.**



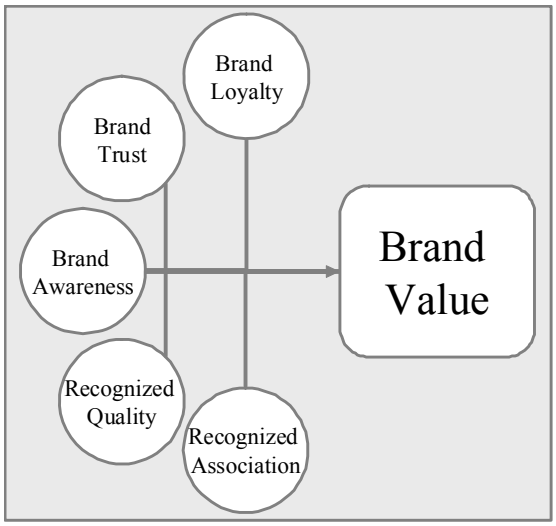

Value in the supplier-OEM dyad is of a qualitative nature because value in business-to-business markets such as these often manifests as "softer" factors such as awareness, trust, brand association or recognized quality (Aaker 1991; Srivastava and Shocker 1991; Kotler and Keller 2006). This is difficult to understand until it is recognized that the OEM derives "softer" value and the supplier can deliver "softer" value because of where the OEM is positioned in the value chain. Specifically, the OEM sits between the component supplier and the end user. In this way, the OEM must manage both sets of relationships. As described above, the OEM derives financially-based value from its end user customers, but in order to efficiently manage its supplier relationships and focus on its end user customers, it must be able to rely and depend on its suppliers. In other words, the OEM derives relationally-oriented value from its component supplier. This relationally-oriented value assists the OEM in attaining the price premiums derived from Ingredient Brand equity at the OEM-end user stage. Component suppliers indirectly derive value from end-user Ingredient Brand equity in other ways, such as, for example, increasing market power, increasing barriers to entry, shortening length of value chain,

and improving brand position, among others. These have all been shown to positively influence willingness of a component supplier to initiate an Ingredient Brand strategy (Luczak et al. 2007).

## TRADITIONAL CONCEPTS OF B2C BRAND EQUITY

To measure brand equity at the B2C level, we build on four influencing factors of the brand. Aaker (1991, 1992) suggests an all-encompassing measurement of brand value. We modify these to determine the advantages of carrying an end product with a branded ingredient. According to Aaker (1991), brand loyalty, trust, brand association and the recognized quality are factors which build brand value (Fig. 4). Each of these is detailed below.

**Figure 4: Qualitative Influence Factors of the Brand Value.**




### Brand Loyalty

Customer loyalty has been a major focus of strategic marketing planning (Kotler and Keller 2006) and offers an important basis for developing a sustainable competitive advantage (Dick and Basu 1994). The definition of brand loyalty by Jacoby and Chestnut (1978) is still used today (e.g., Bandyopadhyay, Gupta and Dube 2005; Quester and Lim 2003; Schoenbachler, Gordon and Aurand 2004). In their definition, Jacoby and Chestnut (1978) discuss brand loyalty as being "(1) biased (i.e., non-random), (2) behavioral response (i.e., purchase), (3) expressed over time, (4) by some decision-making unit, (5) with respect to one or more brands out of a set of such brands, and is a function of psychological (decision-making, evaluative) processes" (1978, p. 2). Despite a multitude of definitions and measurements of brand loyalty (Baldinger and Rubinson 1996; Chaudhuri 1995; Barwise and Ehrenberg 1987; Dick and Basu 1994; Kahn,

Kalwani and Morrison 1986), brand loyalty generally entails a strong commitment to a particular brand on the part of the consumer. Brand loyalty is thought to be an imported concept of marketing practitioners for a number of reasons (Rundel-Thiele and Macky 2001). Dick and Basu (1994) suggest that brand loyalty favors positive word of mouth and greater resistance among loyal customers to competitive strategies. It is widely considered that loyalty is one of the ways with which consumers express his/her satisfaction with the performance of the product or service received (Kahn, Kalwani and Morrison 1986; Delgado-Ballester and Munuera-Aleman 2000; Bloemer and Kasper 1995). Loyal consumers, compared to non-loyal consumers, will work harder to obtain that brand on each occasion, possibly by paying more attention to marketing activities such as advertising and promotion (Bandyopadhyay, Gupta and Dube 2005). However, brand loyalty is a key determinant of brand choice and brand equity (Schoenbachler, Gordon and Aurand 2004). Aaker notes that the brand loyalty of the customer base is often the core of a brand's equity (1991). If customers are indifferent to the brand and will buy with respect to features, price, etc., there is likely little equity. One big advantage of high loyal customer can be found in lower cost of holding customers then the cost of building relationships to new customers (Mussler and Mussler 1995). Brand loyalty can be measured by real customer behavior, their individual performance rating, the customers' satisfaction with product and the sympathy for the brand (Aaker 1991; Kahn, Kalwani and Morrison 1986).

**Trust**

Brand trust builds the core of brand value (Aaker 1991). Trust evolves from past experience and prior interaction (Garbarino and Johnson 1999) because its development is portrayed most often as an individual's experiential process of learning over time (Delgado-Ballester and Munuera-Alemán 2005). People trust a business based on their own past experience as well as by third party recommendations (Reast 2004). Seen as multidimensional in the majority of marketing studies (Raimondo 2000), trust is reported to be: involved, as part of "brand credibility", in brand extension acceptance (Keller and Aaker 1992); fundamental to the development of loyalty (Berry 1993; Reicheld and Schefter 2000); as critical in maintaining successful agency-client relationships (Labahn and Kohli 1997); as a component of brand equity (Dyson et al. 1996); and as essential in building strong customer relationships on the internet (Urban et al. 2000), and "perhaps the single most powerful relationship marketing tool available to a company" (Berry 1995). The impact of brand trust on brand value is manifold. To name only a few, the lower costs of communicating to trusting consumers instead of new ones, the reduced risk for future incomes and increased residual value as an effect of long-term brand effects because of consumers brand trust (Mussler and Mussler 1995; Jenner 2005; Aaker 1991). More, a trusting consumer base is a strong argument for listing trails with retailer. Furthermore, only the existence of loyal consumer increases the awareness of the brand (Kotler and Pfoertsch 2006). Trust is not easy to measure. It can be calculated by exploring the de facto customer

behavior. The estimation of consumer satisfaction and affection to a brand can also be used as an indicator for brand trust (Aaker 1991).

**Brand Awareness**

Brand awareness is defined as the ability of possible consumers to remember that a special brand belongs to a special product (Aaker 1991). Based on that we can separate, there are several levels of brand awareness depending on the ease with which a consumer can recall the brand. Aided recall is insufficient to generate a consumer choice by itself, since the consumer is unable to generate a picture of the brand. The associative memory model would describe the strength of association between the brand and the situation as relatively weak. However, since the consumer can recognize the brand when confronted by it, marketing efforts may still have a positive effect (Bekmeier-Feuerhahn 1998). If consumers make decisions in the store for a group of products, recognition will be very important in shaping the purchase of those products (Pitta and Katsanis 2004). For measuring the brand value for the ingredient, another dimension is necessary. Customers need to recognize the branded component without the host product. They must notice the Ingredient Brand as a special component with a special benefit for the whole product. This benefit must be linked to the component or in other words to the Ingredient Brand Positively identified with an end product, the Ingredient Brand can have positive effects on the recognition as well as the assumption about the adopted quality. Methods to measure the brand awareness are recall-test and recognition test to find out the strength of awareness (Esch and Geus 2001)

**Recognized Quality**

The recognized quality of a product or the ingredient is understood as the customer's assumption about the quality of product function compared to another product (Aaker 1991). At first, recognized quality is an estimation about a product in the eyes of the consumer. Therefore, it can differ from the real quality of a product. We have to consider that the recognized quality of the end product can either be lower in consideration of the branded component as well as higher when first evaluated by the consumer. (Pfoertsch and Mueller 2006; Kotler and Pfoertsch 2006). This factor is the answer to an important question for the OEM: Does the Ingredient Brand enhance the recognized quality of the end product or is my product devaluated by a weaker brand? To measure this, a conjoint analysis or scanner data for the separation of the consumer preferences are used (Srivastava and Stocker 1991).

**Brand Association**

Aaker (1991) asserted that the underlying value of a brand name often is the set of associations, its meaning for the people. Associations represent the basic for purchase decisions and for brand loyalty (Chen 2001). Keller (1993) defined brand associations as the other informational nodes linked to the brand node in memory and contained the meaning of the brand for consumers. Consumer-derived brand meanings are, in part, conveyed in the associations they make with the brand itself (Aaker 1990; Keller 1993); and the associations also provide cues for information retrieval (Tybout et al. 1981; Janiszewski and Van Osselaer 2000; Van Osselaer and Janiszewski 2001). Strong, positive associations help to strengthen brands and the equity that is carried into a leverage situation is affected by the types of associations made with the brand (Park et al. 1991; Keller 1991; Kirmani et al. 1999; Bridges et al. 2000). Brand associations are anything about the likeability of a brand (Aaker, 1990; Keller 1993), and help in the formation of the brand's image (Biel 1991). Brand image consists of the attributes and associations that consumers connect to a brand, they can be "hard", specific tangible, functional attributes of the brand, or "soft", emotional-based attributes of the brand such as trustworthiness or dullness (Biel 1991; Keller 1993). With the help of brand image, products can be differentiated form those of competitors even when the other product is physically 100% identical (Schlagberg 1997). Associations can be measured indirectly as well as directly. The direct questioning of consumers is relatively easy (Bekmeier-Feuerhahn 1998). However, an indirect approach is needed if it's expected that the consumer won't speak clearly and openly about his feelings and attitude (Esch and Andresen 1997).

## MEASURING THE INGREDIENT BRAND EFFECT ON THE BUSINESS-TO-CONSUMER STAGE

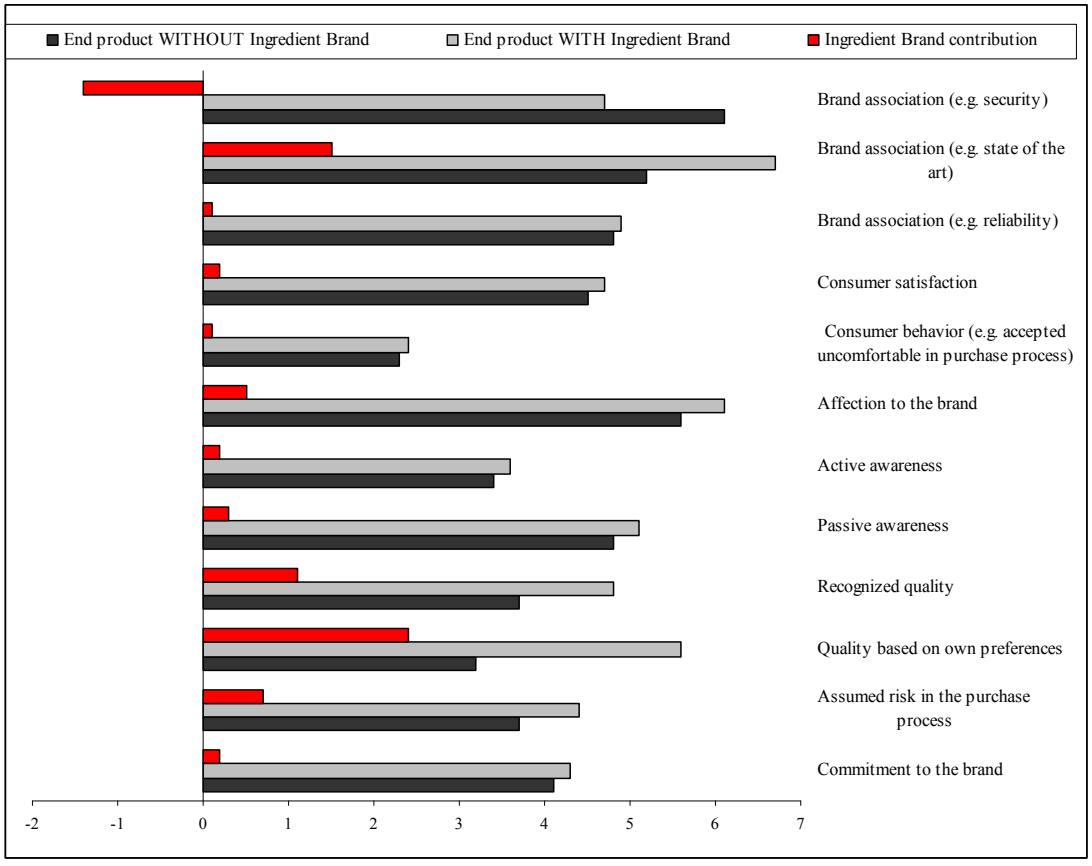
Measurement at the B2C stage is based on Aaker's (1991) brand valuation model. The categories described above are used to illustrate the end consumer's brand understanding. The result is a qualitative brand profile that is as unique as each brand. Each category is operationalized for measuring the brand value from the consumer's perspective. The relativity of a concept such as "trust" is quite evident when considering its meaning across categories such as automotive, durable, or perishable products; explication of the meaning of "trust" should involve methodology that allows for such variations.

In order to further clarify this approach, let us consider "recognized quality". As demonstrated in previous studies, recognized quality is an important aspect to consider particularly in Ingredient Branding because it is often assumed that brands associated with high quality components have positive effects on the whole end product (Havenstein 2004; McCarthy and Norris 1999). With this approach the OEM can determine whether an Ingredient Brand improves the whole recognized quality of an end product. If such positive effects exist, it is

worthwhile to position an end product competitively by displaying the Ingredient Brand logo on the end product. This approach enables managers to utilize qualitative studies effectively, and for scholars of Ingredient Branding to generate a richer understanding of the phenomenon.

To demonstrate, a series of interviews were conducted that asked for opinions of child toys with and without antibacterial protection. The end products were identical, but one of them conveyed the logo of a prominent antibacterial protection plastic. The goal was to determine the effect of an Ingredient Brand on the end product (i.e., child toy). Questions were formulated that centered on notions of child security and play toys. This was done for similar end products that either contained the Ingredient Brand or did not contain the Ingredient Brand. Respondents were instructed to respond on a 7-point scale (0 being respondent associates the end product with security and 7 being respondent does not associate the end product with security). And, responses were collected for both end products. By collecting data that measures perception of the end products WITHOUT the ingredient brand, as well as perception of end products WITH the ingredient brand, it is possible to generate two sets of data. A brand profile, as an example, is shown in fig. 5.

**Figure 5: Quantitative Brand Value Profile With and Without the Ingredient Brand**



First, the black bar represents responses for end products WITHOUT the ingredient brand, while the gray bar represents responses for end products WITH the ingredient brand (Aaker 1991). Looking at these two bars in combination thereby demonstrates the contribution that an Ingredient Brand makes to the end product. The red bar demonstrates a third type of insight about the Ingredient Brand that is relevant for an OEM when deciding whether to initiate this strategy for an end product. More specifically, the red bar is the difference between the black and the gray bar, and it represents which aspects are improved by utilizing the ingredient brand and conveying its use in marketing efforts. It is necessary to keep in mind that this profile is particularly useful for situations with established Ingredient Brands.

## INGREDIENT BRANDING AND THE B2B2C CHAIN

In the B2B2C chain, both the component supplier and the end user are involved, and they each represent endpoints of the chain. An important assumption of Ingredient Branding in the B2B2C chain is that the component supplier undertakes the effort to communicate the benefits of a branded ingredient to the end user using instruments of the marketing mix (Kotler and Pfoertsch 2006; Luczak et al. 2007).

To determine the success of B2B2C marketing activities, Havenstein (2004) recommends using the willingness to pay price premiums. However, most component suppliers implement an Ingredient Branding strategy expecting many advantages, including reducing the anonymity of a component, differentiating components from other competitors, and generating pull effects through the value chain by generating end user preference for the branded ingredient (Pfoertsch and Mueller 2006). Measuring success on all these dimensions is difficult.

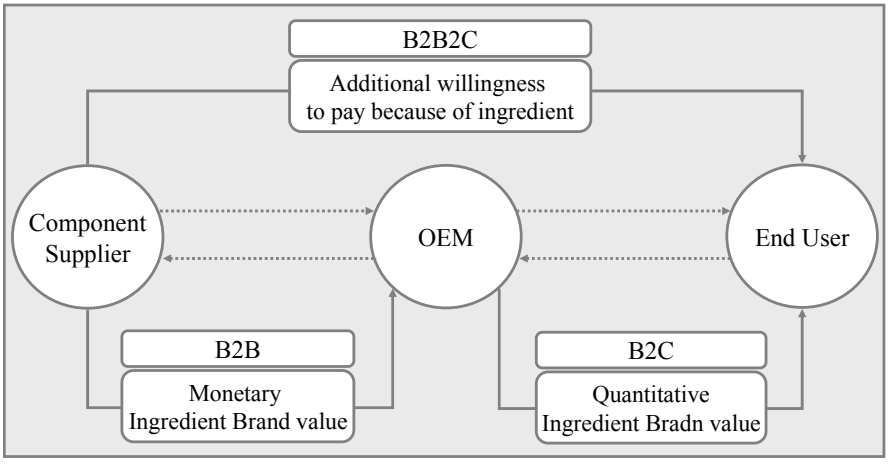
For this reason, it is recommended that "end user willingness to pay a price premium for an end product with the branded ingredient" is useful as a single index of success for the following reasons. First, it demonstrates that end users are aware of the component brand because they would not otherwise be willing to pay the price premium. Second, it demonstrates that end users are able to differentiate among competing component suppliers. More important, it demonstrates end users' ability to recall positive associations with the Ingredient Brand and use this recall to the benefit of the whole end product. Third, it demonstrates the positive accrual of a pull effect (From this point of view, a sales premium can also be seen as a price premium, instead of a higher sales, price can be increased.). Extending the analysis to a broader realm of the B2B2C chain sheds light on otherwise "invisible" mechanisms in Ingredient Branding strategies. For example, analysis of the OEM-end user stage as extracted from the B2B2C chain makes it difficult to isolate determinants of why the OEM embedded the branded component in its end product offering to the end user. However, investigating the end user's willingness to pay a price premium, along with the other mechanisms in the B2B2C chain does not constrain analysis to the OEM's procurement decisions. Instead, the analysis focuses on the motivations of the OEM to use the branded ingredient in an end product.

There are a wide range of instruments to measure willingness to pay for an end product embedded with an Ingredient Brand. The most prominent and well-established method is conjoint analysis because it can be used to discover and compare varying attributes and sub-benefits. One of these sub-benefits may be the Ingredient Brand (Havenstein 2004; Sattler 1997). As demonstrated above, it is a strong, attainable, and rigorous determinant of Ingredient Branding success.

## CONCLUSIONS AND PERSPECTIVES FOR FURTHER DEVELOPMENT

This paper demonstrates the complex structure of an Ingredient Branding strategy by explicating how a branded component affects the multiple stages of exchange that exist among a component supplier, OEM, and end user. Giving attention to this network from the perspective of the component supplier allows an exploration of value that can be harnessed from the supplier's point of view. Building on existing marketing theory, this paper demonstrates that many questions remain unanswered and also demonstrates that the mechanisms of Ingredient Branding operate differently at each stage of the network. And, as a result, it highlights that assessing Ingredient Branding effects at multiple stages of the B2B2C chain requires varying types of measurement tools, data collection methods, and analysis techniques. These requirements demonstrate, on one hand, that each stage of Ingredient Branding requires various – perhaps contrasting – approaches to building brand equity at each stage (B2B vs. B2C and B2B2C branding). On the other hand, these requirements demonstrate that the component supplier's position and perspective relative to brand strategies are important in driving relevant, useful, and competitive brand and marketing theories.

**Figure 6: Measurement Methods on the Characteristic Stages of Ingredient Branding**



In summary, the value of brand equity at each stage of the value chain should be considered independently and in combination with the other stages.

Instruments for measuring Ingredient branding success at multiple stages are summarized below, and also in Figure 4.

B2B Stage: The level between the component supplier and the OEM is the most important point at which the component supplier can generate financial benefits. Here, a successful Ingredient Branding strategy reaps the benefits of a pull effect from the end user that drives the OEM to prefer the branded component over an unbranded one. Therefore, at this stage, it is recommended that a financially-oriented measurement tool based on price premiums be used.

B2C Stage: From the perspective of a component supplier, the end user is distant and often out of immediate reach. However, Ingredient Branding is most successful when it can be fruitful at all levels of the B2B2C chain. In the B2C (or OEM-end user) stage, it is recommended that success be evaluated with a quantitative method from the perspective of the OEM.

B2B2C Stage: Analysis of the B2B2C chain is also quantitative, and is based specifically on end user willingness to pay a price premium. For several reasons (such as Ingredient Brand awareness, differentiation, consumer's connection of positive brand understanding and initial point for pull effects), end user willingness to pay a price premium signifies successful branding efforts from the perspective of the end user.

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# CRITICAL FACTORS PROMOTING CUSTOMER LOYALTY TO SMARTPHONE AND MOBILE COMMUNICATIONS SERVICE PROVIDERS

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## ABSTRACT

*The present study examines the relationships between corporate image, price, product quality, product innovation, and customer loyalty, and investigates key drivers that establish and maintain customer loyalty to smartphone and mobile telecommunications service providers. One hundred and twelve samples, which were collected from participants in a web-based survey in the United States, were analyzed using multiple regression analysis techniques. The results of the study show that corporate image, product quality, and product innovation are strong antecedents for establishing customer loyalty in high-tech product markets. In addition, the empirical findings show that product innovation plays an important role in establishing and maintaining customer loyalty. However, price shows no relationship to customer loyalty, a finding that partly contradicts previous research. Based on the findings of the study, this study discusses possible strategies for marketing success in high-tech product markets.*


## INTRODUCTION

For decades, wireless carriers have treated handset manufacturers like serfs, using access to their networks as leverage to dictate the kind of phones to be manufactured, their cost, and the available features. Carriers have largely viewed handsets as cheap, disposable lures that have been massively subsidized to snare subscribers and lock them into using proprietary services. However, the iPhone has upset that balance of power. Carriers are learning that the right phone—even a pricey one—can attract customers and bring in revenue. Now, in pursuit of an Apple-like contract, every manufacturer is racing to create a phone that consumers will love, instead of one of that carriers will approve. Currently, the market for high-end phones like the Apple iPhone is growing. Many people want the Internet, video, and personal digital assistant (PDA) features in one device. The smartphone market will likely continue to expand rapidly in coming years. As a result, more companies are entering the market and increasing competition.

Traditional companies have typically conducted consumer research, characterized customer satisfaction, determined how products are used, identified explicit product-related needs, and then focused on developing product features that meet those needs. But they have not made an effort to uncover the full range of their customers' unspoken needs and unmet wants. Delivering innovative product and service offerings requires personal interactions with

customers. These interactions should be designed to let firms listen and carefully observe as customers express their true feelings about their experiences. The rapid advances in information communications technology provide greater opportunities for today's firms to establish, nurture, and sustain more long-term relationships with their customers than ever before. The ultimate goal is to transform these relationships into greater profitability by reducing customer acquisition costs and increasing repeat purchases. Recognizing the mounting importance of customer orientation, firms in all kinds of industries, ranging from manufacturing to information services, are exploring service-led growth as a promising means of differentiation. Service is no longer treated as a stand-alone marketing decision aimed at increasing customer satisfaction.

Telecommunications companies are advancing technology and exploring new product offerings. As a result, the competition within the industry is increasing. The U.S. mobile communications market, one of largest, is especially competitive. How should firms survive in such competitive markets? In the past, customers were provided with financial incentives to sign up or switch service from one provider to another. Over time, with the increased market saturation, companies have come to realize their performance can improve by focusing more on retaining customers than attaining new customers. As the market provides an increasing range of opportunities for customers, how can mobile telecommunications service providers create and maintain customer loyalty? The present paper investigates key drivers that generate and maintain customer loyalty to smartphone and mobile telecommunications service providers. In doing so, this paper examines the relationships between corporate image, price, product quality, product innovation, and customer loyalty.

## LITERATURE REVIEW

Although customer loyalty is increasingly seen as a prime determinant of long-term financial performance in competitive markets, there are clear gaps in our knowledge of the antecedents of loyalty. Service quality and customer satisfaction are viewed as key drivers of customer loyalty (Lai, Griffin, & Babin, 2009), and research generally tends to consider the links between key drivers and loyalty (Balabanis, Reynolds, & Simintiras, 2006; Guo, Xiao, & Tang, 2009). A study demonstrated online word-of-mouth has a positive relationship to customer loyalty (Gruen, Osmonbekov, & Czaplewski, 2006). Much research has shown that the emotions involved in service recovery have a strong relationship to loyalty as well (Chebat & Slusarczyk, 2005; Lee, Lee, Lee, & Babin, 2008). Many researchers find that high service quality correlates with relatively high customer satisfaction (Cronin, Brady, & Hult, 2000), which in turn drives loyalty (Ennew & Binks, 1999; Lai, Griffin, & Babin, 2009). Overall, the causal order of service quality leading to customer satisfaction receives considerable support and empirical validation (Bove & Johnson, 2001; Brady & Robertson, 2001), and this link further explains the variance in customer loyalty.

In the telecommunications industry, product sales are paramount and the service department provides basic after-sale support for products, often in the form of parts repair. Accordingly, the product revenues dwarf the service revenues. In this situation, service innovation is limited to keeping the product in use and the customer satisfied with his or her purchase. Ideally, in this new stage of product development, companies will provide additional after-sale services that complement their products. This service will improve customer satisfaction with existing products, increase loyalty and trust in products and lead to additional purchases. Accordingly, integrated product and service innovation requires a deep understanding of customers in order to provide them with the most attractive value propositions that best address their needs. Existing research on services and relationships treats customer service as a major operating variable, and focuses on measuring the resulting customer satisfaction, retention, repeat purchases, and word-of-mouth (Sun, 2006). Rust and Chung (2006) gave an excellent review of existing marketing models of service and customer relationship management. They proposed that service quality tends to encourage customer loyalty to the service provider.

Corporate image is another important factor in the overall evaluation of service quality. Corporate image is defined as the perception of an organization that customers' hold in their memories. Because it works as a filter through which a company's whole operation is perceived, a corporate image reflects a company's overall reputation and prestige. Aydin and Ozer (2005) claim that a corporate image emerges from a customer's net consumption experiences; hence, perceptions of service quality affect corporate image. Brown and Dacin (1997) claim corporate image derives from customers' perceptions of capability and social responsibility. Corporate capability refers to the company's expertise in delivering product and service offerings, such as effective innovation and high service quality, while corporate social responsibility refers to the company's management of social issues. Corporate image thus impacts a customer's evaluation of service quality, satisfaction and loyalty (Andreassen & Lindestad, 1998; Zins, 2001). Signaling theory provides a framework for explaining the empirical link between corporate image and customer loyalty (Erdem & Swait, 2004). According to this theoretical view, the institution's communications, developed to build its reputation for social responsibility and capability, create a repository of credible information signals. Customers use these cues to ascertain the quality and value of the intangible services the firm provides (Teas & Agarwal, 2000). Moreover, much research that applies signaling theory to an online environment finds that reputation plays an important role for consumers when determining the product quality of an online retailer (Chen & Dubinsky, 2003; Kwon & Lennon, 2009). In other words, consumers who develop a positive mental schema of a brand will tend toward higher satisfaction and loyalty (Brodie, Whittome, & Brush, 2009; Hartman & Spiro, 2005). Therefore, a positive corporate image appears to encourage customer loyalty to the service provider.

A number of empirical studies have found a strong positive association between price, customer satisfaction, and loyalty in business-to-consumer settings (Hidalgo, Manzur, Olavarrieta, & Farías, 2008; Kukar-Kinney, 2006). One such study showed that a strong

relationship exists between price fairness and store loyalty in a retail context (Martin, Ponder, & Lueg, 2009). Another study showed a strong relationship between price and loyalty on the Internet (Grewal, Iyer, Krishnan, & Sharma, 2003). As firms shift their purpose from offering services in order to increase customer satisfaction to building long-term relationships with customers in order to make a sustainable profit, many innovative pricing structures have emerged, including pricing for service upgrades, subscription pricing, and advanced selling. Many researchers have started to examine the nature of these pricing tactics (Xie & Shugan 2001). Essegaier et al. (2002) and Danaher (2002) provided helpful discussions of two-part pricing, which includes a fixed fee and usage rate. For example, the most recent pricing strategy adopted by mobile communications service providers no longer has a price-per-unit structure. Instead, it is framed as payment for the right to consume a certain amount of services within a period of time. Preliminary empirical evidence demonstrates that customers' choices of service plans are driven by their anticipated maximum future consumption. Though further empirical research is needed to validate these nominal findings and measure their effectiveness, it is proposed that price tends to stimulate customer loyalty to the service provider.

Innovation, as an institutionalized capability, characterizes technological change (Tzeng, 2009). Technological innovation varies in complexity and can range from minor changes to existing products, processes, or services, to the development of breakthrough products, processes or services that introduce novel features or perform exceptionally well. Technological innovation is a risky endeavor and strong public support is clearly needed to encourage innovation, especially in its early stages (Khade, 2007). Innovation is defined as any idea, practice, or object adopted by an individual or organization that regards it as new (Bhaskaran 2006). Innovation is further defined as an industry's willingness to place strong emphasis on new products, new services, improved product lines, and general technological advancement. The most prominent innovation dimensions include radical, incremental, product, process, administrative, and technological innovation (Camison-Zomoza, Lapiedra-Alcami, & Boronat-Navarro, 2004).

The most common of these dimensions is product innovation. Broadly, product innovation reflects change in the end product or service offered by the organization, whereas process innovation represents changes in the way firms produce end products or services. In this context, product innovation refers to new products or services introduced to meet an external user or market need, which means an innovation's newness of remains a matter of perception. Company resources are mostly invested in technological innovation related to new and improved products and process innovation related to improvements in manufacturing and assembly (Shelton, 2009). One innovation stream examines the influence of organizational structures, strategic processes, and people on the development and marketing of new products (Dibrell, Davis, & Craig, 2008). Within this stream, an innovation refers to a new product that an organization has created for the market and represents the commercialization of an invention. Overall, product innovation has been shown to be a potentially significant source of strategic

advantage. It is proposed that product innovation, like positive corporate image and price, tends to stimulate customer loyalty to the service provider.

Overall, the literature suggests that key drivers affecting customer satisfaction with and loyalty to mobile communications service providers need to be better understand. Some scholars expressed reservations regarding the marketing of mobile communications service providers, which suggests that understanding key factors related to satisfaction and loyalty will help direct the further marketing efforts of mobile communications service providers. Any product or service can be modeled as an entity with a set of attributes. For example a mobile phone may have the following attributes: product image (brand, company), price (price of hand-set, service charges), product quality (quality of communications), and product innovation (technological advancement of the products). Accordingly, the following hypotheses are proposed:

*Hypothesis 1: The corporate image of a smartphone is associated with customer loyalty to the mobile communications service provider.*

*Hypothesis 2: The price of a smartphone is associated with customer loyalty to the mobile communications service provider.*

*Hypothesis 3: The product quality of a smartphone is associated with customer loyalty to the mobile communications service provider.*

*Hypothesis 4: The product innovation of a smartphone is associated with customer loyalty to the mobile communications service provider.*

## RESEARCH METHODOLOGY

### Data Collection and Sample Characteristics

A web-based survey to students in an online master degree program during the 2009-2010 school year was conducted. In total, the survey yielded 145 responses. Of the 145 responses, 33 were considered unusable due to relatively high amounts of missing data, while 112 were complete and used for data analysis. All survey items regarding smartphone and mobile communications service attributes were measured using a five-point scale. Customer loyalty was measured by two questions, one assessing satisfaction with a particular mobile communications service provider and the other the intention to continue using that service provider.

The survey included 60 male respondents (53.57%) and 52 female respondents. Forty respondents were between 23–29 years old (35.7%), 61 were between 30–45 years old (54.46%), and 11 respondents were between 46–60 years old. One hundred and four respondents (92.86%) were full-time employees and five were part-time employees, while three were unemployed. Of

the 104 full-time employees, 63 worked as managers, 12 as executives and 29 as staff in their workplaces.

## Descriptive Statistics of Survey Questions

In reply to the question, "When you choose a smartphone, how important are the following attributes?" 64 respondents (57.14%) chose the very important or important option for the corporate image attribute. For the price attribute, 102 respondents (91.07%) chose the very important or important option. For the product/service quality attribute, 110 respondents (98.21%) chose the very important or important option. For the technological advances and innovation attribute, 91 respondents (81.25%) chose the very important or important option. In reply to the question, "After purchasing a smartphone, how satisfied are you with the following attributes?" 83 respondents (74.11%) chose the very satisfied or satisfied option for the corporate image attribute. For the price attribute, 80 respondents (71.43%) chose the very satisfied or satisfied option. For the product/service quality attribute, 82 respondents (73.21%) chose the very satisfied or satisfied option. For the product innovation attribute, 81 respondents (72.32%) chose the very satisfied or satisfied option.

In reply to "What brand of mobile phone do you have?" 17 respondents (15.18%) reported having Apple 3G iPhones, 34 respondents (30.36%) reported having Blackberry phones, 9 respondents (8.04%) reported having Motorola phones, 19 respondents (16.97%) reported having Samsung or LG smartphones, and 33 respondents reported having other brands. In reply to the question, "Overall, how satisfied are you with the current mobile phone you have?" 83 respondents (82.18%) chose the very satisfied or satisfied option. In reply to the question, "What mobile communications service company do you use?" 38 respondents (33.93%) use AT&T, 37 respondents (33.04%) use Verizon, 19 respondents (16.96%) use Sprint, 8 respondents (7.14%) use T-mobile, and 10 respondents use other companies. In reply to the question, "Overall, how satisfied are you with the current telecommunications company you subscribe?" 76 respondents (72.25%) chose the very satisfied or satisfied options. Table 1 shows the result of a correlation analysis of product attributes.

**Table 1: Results of Correlation Analysis of Product Attributes**

| ATTRIBUTES | Customer loyalty | Corporate image | Price | Product quality |
|---|---|---|---|---|
| Customer loyalty | 1.000 | | | |
| Corporate image | 0.499*** | | | |
| Price | 0.443*** | 0.499*** | | |
| Product quality | 0.565*** | 0.388*** | 0.479*** | |
| Product innovation | 0.516*** | 0.478*** | 0.441*** | 0.480*** |

***, $p < 0.001$, correlation is significant at the 95 % confidence level (1-tailed).

## RESULTS OF HYPOTHESIS TEST

Measures of association are numerical values that yield information about the relatedness of variables. The measure of association applied in this study is multiple regression analysis, a statistical tool that analyzes the degree of relatedness between many independent variables and one dependent variable. To examine the statistical significance of the model, the following measures were used. R square, the coefficient of the determination, indicates the total amount of variability in the dependent variable which is explained by the independent variables. The adjusted R square takes into account the number of independent variables included in the regression equation and the sample size. The partial t-values were calculated and used to test the statistical significance of the independent variables.

Null hypothesis 1, "There is no relationship between corporate image and customer loyalty"; null hypothesis 2, "There is no relationship between price and customer loyalty"; null hypothesis 3, "There is no relationship between product quality and customer loyalty"; and null hypothesis 4, "There is no relationship between product innovation and customer loyalty," were all tested by the data. The results showed all relationships are statistically significant ($p < 0.05$) at the 95% confidence level, except the relationship between price and customer loyalty ($p > 0.05$) (Table 2). The findings suggested that corporate image, product quality, and product innovation are significantly related to customer loyalty to the mobile communications service provider, whereas price is not significantly related to customer loyalty. That means if respondents believe a product is high quality they have a tendency to perceive it as desirable to purchase regardless of its price.

**Table 2: Results of Hypothesis Test**

| Variables | B | Std. Error | Beta | t-statistics | VIF |
|---|---|---|---|---|---|
| H1: Corporate image | 0.236 | 0.091 | 0.230 | 2.605** | 1.555 |
| H2: Price | 0.072 | 0.088 | 0.073 | 0.813 | 1.566 |
| H3: Product quality | 0.313 | 0.081 | 0.339 | 3.878*** | 1.483 |
| H4: Product innovation | 0.220 | 0.093 | 0.211 | 2.376** | 1.532 |
| Dependent variable: customer loyalty to mobile communications service providers<br>R square = 0.448, adjusted R square = 0.437, F-value = 21.694, significance = 0.000<br>**, $p < 0.05$; ***, $p < 0.001$, coefficient is significant at the 95% confidence level. | | | | | |

Three factors—corporate image, product quality, and product innovation—are proven to influence customer loyalty. Since beta coefficients in the regression model are the standardized regression coefficients that allow for a direct comparison between coefficients with respect to their relative explanatory power on the dependent variable, they were used for the direct comparison. The beta coefficient of product quality is 0.339, while that of corporate image is 0.230, and that of product innovation is 0.211. The findings suggest that the product and service quality of providers is most significantly related to customer loyalty.

## DISCUSSIONS

The results of this study reinforced previous research that suggested corporate image and product quality are strong antecedents for establishing customer loyalty. In addition, product innovation is also a strong antecedent for establishing customer loyalty in high-tech product markets (e.g., smartphone and mobile communications services). However, price shows no relationship to customer loyalty, which partly contradicts previous research. One plausible explanation for this is that consumers' sensitivity to price is decreasing as the importance of having high quality products and service increases in high-tech markets. Obviously, service providers should consider price and strive to build and monitor their price fairness in the market. More customer-centric companies usually offer high value-added products in addition to lower cost products, giving them the option to offer reasonable prices. In this way, they are able to cash in on the lower cost items while still generating superior customer value and loyalty.

This study demonstrated that product innovation plays an important role in creating and maintaining customer loyalty in high-tech product markets. When pursuing customer loyalty, marketing managers should consider the roles of corporate image, product quality, and product innovation, particularly product innovation for technology-oriented products and services. The study results indicated product innovation plays an important role in generating positive outcomes for high-tech product and service firms. The speed of product innovation will determine a new future for marketing in high-tech product markets in coming years. Smartphone makers and mobile telecommunications service providers should market new products as quickly as the innovation itself occurs. When a company tries to link market potential and product innovation, important criteria that must be considered, particularly whether the innovation they have been developing will receive the widest distribution and use if it is in the public domain and available to any interested party. There may be a thin, but clearly defined market for the product. The product may not be appropriate for the general market but rather aimed at certain users in specific situations. In these situations, it is better if market potential is combined with product innovation. If a company pursues product innovation while assessing market potential, the product will be like a golden goose that brings in money. If it does not link market potential to product innovation, a company risks potential market rejection. No matter how great their product innovation or their anticipated market potential, it is essential that a company evaluate actual market potential before pursuing product innovation.

Companies that aim to successfully achieve product innovation should implement certain common practices that will support their drive for innovation. The job of developing new products in these companies should rest with both marketing and technology groups whose members should work together in highly integrated cross-functional teams dedicated to the job of product innovation. These groups should work at either a division or corporate level and include both technical and marketing staff, and often other staff who have relevant functions as well. It is

important for all sides to work together closely and cooperatively. Instead of viewing themselves as separate departments, marketing and technology groups in these companies must capitalize on their diverse perspectives to create innovative new products that match market needs. Therefore, highly innovative companies involve both marketing and technology groups in idea generation processes from the initial stages onward. This type of collaboration sets the tone for future cooperation and continued success with new product development. Innovative companies should strive to create a culture that emphasizes and supports a balance between technological push and market pull.

## CONCLUSION AND LIMITATIONS

This study endeavored to help marketing practitioners better understand the key drivers that create and maintain customer loyalty in a highly competitive market. The results reinforced previous research that suggested corporate image and product quality are strong antecedents for creating customer loyalty. In addition, the empirical findings of this study showed that product innovation plays an important role in creating and maintaining customer loyalty in high-tech product markets. Marketing managers should consider the roles of corporate image, product quality, and product innovation in creating customer loyalty. The results also showed that consumers' sensitivity to price is currently decreasing while their interest in having a high quality products and service is increasing. Successful companies usually offer high value-added products in addition to products at a lower cost. In this way, they are able to profit from the lower cost items while generating superior customer value and loyalty.

Several limitations of the study should be noted. First, certain important factors were not investigated by the model—for instance, one unexplored factor that may influence customer loyalty is switching barriers. Second, the sample was collected from a homogeneous group of graduate students between the ages of 25 and 45 who have achieved relatively high levels of education and earn their own incomes. Therefore, future research must extend to diversified samples in order to ensure this model's full applicability to other settings.

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# DEVELOPING A MULTI-ITEM MEASUREMENT SCALE FOR DEVELOPING TEENAGERS' INVOLVEMENT IN REALITY TELEVISION

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## ABSTRACT

*The aim of this paper is to develop and confirm a multi-item measurement scale for developing teenagers' involvement in Reality Television. Understanding involvement of teenagers' in RTV so that its role in their consumption behavior can be better understood in important for further theory building in the consumer behavior field. Various researchers have proposed liking, time spent on watching, level of attention provided and audience desire to attend as the domain items for teenagers' media involvement. Using a multi-step process, this research refined and adapted a nine item measurement scale for developing country teenagers' RTV involvement. These were then tested and confirmed using exploratory and confirmatory factor analyses techniques.*

## INTRODUCTION

Teenagers worldwide are an emerging market segment that is receiving increasing attention from researchers (Bhosale & Gupta, 2006; Lueg & Finney, 2007). Specifically, as a consumer socialisation agent; electronic media receives maximum attention (Dotson & Hyatt, 2005; Vakratsas & Ambler, 1999). Reality Television (RTV) is a contemporary electronic media vehicle. The idea of RTV originated from documentary TV programs and the growth of RTV is still in its early stage (Biressi, 2005; Deziel, 2004; Hill, 2005). Still, RTV has generated a lot of interest among teenagers because of its interesting content (Lundy & Jacobson, 2008). Furthermore, the nature of participants (Jacobs, 2008), format (James, 2007), and reward system (Driscoll, 2007), makes RTV different and exclusive from other TV programs. Understanding the involvement of teenagers' in RTV so that its role in their consumption behaviour in a developing country can be understood is critical for further theory building in the field. It is particularly important due to the huge size of the teenaged market segment and impressive growth of electronic media in developing countries (Bhosale & Gupta, 2006; Quraishi, Bhuiya & Mohammad, 2004). Further, theory building in this area is also important in developing countries, where the population is relatively young. Accordingly, the key problem this research will address is:

*How to measure developing country teenagers' involvement with reality television (RTV)?*

## INVOLVEMENT WITH MEDIA

In media research, involvement pertains to media users' relationships with the message conveyed by media, media personalities, or other media users (Rubin & Step, 1997). To understand involvement, one needs to understand the audience and the role of involvement between media motive and media effects (Perse, 1998). Lin (1993) explained that audience activity is a construct describing audience's involvement when using the media. Activity is mostly manifested in people's media motives, selectivity, and involvement with the message provided by media (Blumer, 1979). Levy and Windhal (1984) focused on three types of activity: a) selective before exposure, b) involvement during exposure, c) and use after exposure. Several researchers have investigated relationships between media motives, involvement, and effects. Perse (1990) found that instrumental viewing motivation positively related to elaboration, whereas ritualistic viewing motivation positively related to engaging in distracting behaviour. Perse (1998) also found instrumental motivation predicted cognitive and affective involvement (e.g., positive reactions) with television viewing.

### Involvement with RTV

The idea of RTV originated from documentary TV programs and the growth of RTV is still in its early stage (Biressi, 2005; Deziel, 2004; Hill, 2005) and not much academic research has been done on it or its effects. On theoretical grounds, cultivation theory suggests that frequent TV viewing increases the likelihood of the adoption of expressed values and beliefs that will ultimately alter teenagers' actual behaviour (Gruber & Thau, 2003). Moreover, intensive TV viewing brings greater changes in values, beliefs, and resulting behaviour. Cultivation theory states that people who watch TV for many hours a day think differently about the social reality than people who rarely or never watch TV (Nacos, 2000). Cultivation theorists suggest that TV programming cultivates a mainstream world view that reflects and perpetuates the social view (Hetsroni & Tukachinsky, 2006; Nacos, 2000).

So far, researches on teenagers involvement in the context of RTV have been rarely examined (Yoon & Garma, 2006). Various researchers, however, have proposed different domain of scale items to measure the involvement with media generally that may be adapted to measure teenagers' involvement in RTV. Liking (e.g., watching RTV, reading about RTV) is one of the common domains to measure the involvement with RTV (Pecheux & Derbaix, 2002; Yoon & Garma, 2006). Yoon and Garma (2006) added that involvement with media is also measured by how much time audience spend to watch different shows relating to media celebrities. Furthermore, amount of attention given to media is considered as a measurement domain of media involvement (Perse, 1998; Yoon & Garma, 2006). In addition, audience desire

to attend RTV shows also indicates their involvement with it (Dolliver, 2006). However, involvement with RTV is not only addressed as a source of fun and fantasy but also as a source of information (Higie & Feick, 1989). Overall, Table 1 shows the domains of scale items to measure RTV involvement adopted from the current literature on media involvement.

**Table 1**
**Domain of Scale Items of RTV Involvement**

| Construct | Domain of Scale Items |
|---|---|
| RTV involvement | Time spent, Likings, Attention, Desire towards RTV (Dolliver, 2006; Higie & Feick, 1989; Pecheux & Derbaix, 2002; Perse 1998; Yoon & Garma, 2006) |

## RESEARCH METHODOLOGY

While some measurement items of RTV involvement have been identified from the current literature, the measurement items are not directly applicable to developing country teenagers without some refinement as they were related to various other electronic media vehicles and not directly to RTV and generally developed country based research findings.

As recommended by Churchill Jr. (1979), a widely used process for developing measurement scales in marketing involves the following steps:

Defining theoretical construct
Generating a list of items from literature and/or qualitative research that relate to the construct, and
Purifying these measures using exploratory factor analysis and coefficient alpha.

In this research all of the above steps were followed and the third step was supplemented with confirmatory factor analysis (Bristol & Mangleburg, 2005; Shrum, Burroughs & Gainesville, 2005). Qualitative research was conducted to help refine the teenagers RTV involvement construct and its measurement variables that have been developed based on the current literature, and quantitative methods to test the construct.

Exploratory factor analysis was considered a test of dimensionality, with the aim to produce a set of items that reflect a single underlying factor or construct. To assess the internal consistency reliability, a popular approach, coefficient alpha was used, at the exploratory factor analysis stage. Confirmatory factor analysis using AMOS was carried out to give a truer estimation of reliability and formally test the uni-dimensionality of a scale (Hoyle, 1995).

Data for both qualitative and quantitative phases of this research was gathered from Bangladesh, a typical developing country. At the qualitative stage, two separate Focus Group Interview (FGI) sessions involving 10 Bangladeshi teenagers in each were conducted. During these FGI sessions participants were encouraged to describe events, draw linkages, and give

explanations about their involvement in RTV. Both the FGI's were audio recorded with prior approval from each participant and following pre-determined ethics protocol. The data was analysed using content analysis method (Weber, 1990). This method is often theory driven e.g., theory determines what to look for (Weber, 1990). In this research the variables developed through the literature review were the basis for what to look for in the FGI data. Looking at the transcripts the themes and how these themes relate to each other were identified analysing each sentence spoken by the participants.

Data for the quantitative phase of the research was gathered from Bangladeshi teenagers using a Bengali (local language) version of a structured questionnaire initially developed in English. This questionnaire was also pilot tested. A total of 400 respondents were surveyed with equal representation of each gender. Age group wise there were higher representation (75.3%) of late teenagers (16-19 age group) then young teenagers (13-15 age groups) who had 24.7% representation. After screening, 368 questionnaires were considered valid and used for analysis.

## REFINEMENT OF MEASUREMENT SCALE

Findings of this phase of the research show that teenagers of both genders watch RTV. Generally, girls watch RTV more regularly than the boys. Overall, eighteen participants of the two groups regularly (at least 5 hours a week) and two participants occasionally watch RTV. Overall though, most of teenagers regularly watch only their favourite RTV shows, rather than watching RTV for a particular number of hours. Moreover, they pay close attention when they watch their favourite RTV shows. However, boys spend lesser time than girls watching RTV and claim to pay more attention while watching RTV shows. One participant (B 2) said, 'I watch and think when it is a quiz show e.g., 'Dus Kadam'. Teenagers watch RTV not only for entertainment but also for getting information about among other things, products and services in the market. Teenagers also keep themselves updated about RTV shows and it's celebrities from various sources including newspapers. Overall, both boys and girls mention that they selectively read about their favourite RTV shows in newspapers. One participant (G 1) also mentioned, 'I read newspapers that help me to know about RTV, e.g. KBC, Roddies'. However, teenagers do not watch everything that they read in newspapers about RTV and its celebrities. Teenagers of both genders know that the internet is a powerful medium for watching RTV, although none of them watch RTV on the web regularly. They think the internet is expensive and because of the server's slow speed, they only occasionally watch RTV on the internet. However, both the groups expressed their interest in watching RTV on the internet, provided they could afford it and get the chance. Interestingly, one participant (G 4) mentioned that 'my parents have a negative attitude towards the internet but I know that they are wrong'.

Generally, both the boys and girls are involved in RTV. They also show interest in participating in RTV. However, they are also concerned about the standard of RTV shows. Furthermore, they have also shown interest in participating in RTV, if their favourite RTV

celebrities are in the program. One of the participants (G 3) mentioned, 'I wish I could meet with my favourite singer at RTV shows e.g., Fan club tournament'. Some of the respondents follow their favourite celebrities' style and fashion. One of the participants (G 4) mentioned, 'I would like to meet my favourite hero at 'Super Hero and Heroine' shows'. Teenagers however, have different motives behind attending RTV but both the groups are also concerned about the content of the RTV that they wish to join. A couple of participants (B 8, G 3) mentioned, 'We do not go with all RTV shows, I am a viewer of quality shows like Amar Ami, Amazing Race'.

Sometimes teenagers also play imaginative roles while watching particular RTV shows. They often critically analyse complex situations like game shows, quiz shows of RTV and like to imagine how they would react in that situation. However, this seems to be more common among boys than girls. Also, respondents have mixed feelings about RTV celebrities who participate in multiple types of programs. RTV celebrities who are participating in different programs do not carry much appeal among teenagers. Most of the FGI participants want to see the celebrities' original performance, not excessive media presence. One respondent (B 10) added, 'RTV celebrities want quick fame'. Still though, most of them follow the RTV celebrities' who participate in multiple featured programs.

Teenagers were also asked about the credibility of RTV content. Majority of them think that RTV is real. One respondent (G 2) added, 'Live shows like 'Phone & Live Concert' give me real pleasure'. They consider these shows as more realistic, as the audience votes for participants and programs are telecast as live shows. Interestingly, one respondent (B 11) said that 'RTV participants are real but judges are commercial'.

Teenagers watch RTV, but do not allocate any particular number of hours to watching RTV. So, certain programs rather than any particular number of hours viewing are important to them. One participant (B 9) of the middle social class said that, 'Watching RTV is not our routine job'. Interestingly also, teenagers have shown low interest in voting, either by short message service (SMS), or making phone calls for RTV shows. They think it is unnecessary expenditure. Interestingly, two boys (B 1, 2) said, 'If we would get any benefit then I will vote in RTV'. One girl (G 10) was more specific, 'If I would get cash money then I will vote in RTV'. Overall, both boys and girls are selective regarding sending votes for RTV shows and none of them cast their vote regularly for the RTV shows and its celebrities. Moreover, none of the teenagers think about RTV situations when they are not watching RTV, be it in leisure periods or in busy moments

On the basis of the FGI findings, the measurement domains and variables of the construct RTV involvement were refined, adapted and rejected for further quantitative testing, as these were developed from the perspective of developed countries, and refinement was needed so that they are relevant for a developing country. Furthermore, a new scale items was developed on the basis of the FGI findings for further analysis. Table 2 shows the refined domain and measurement variables of RTV involvement.

**Table 2**
**List of Domains and Scale Items of RTV Involvement**

| Construct | Domains | Scale Items from Existing Literature | Adapted Scale Items from Literature and New Scale Items from FGI |
|---|---|---|---|
| RTV Involvement | a) Time spent (Yoon & Garma 2006) | 1) I watch RTV. | 1) I watch RTV. |
| | b) Likings (Dolliver 2006; Pecheux & Derbaix 2002; Yoon & Garma 2006) | 1) I would attend a public appearance if my favorite RTV character from the show were there.<br>2) I watch other programs that include contestants from the RTV show.<br>3) Reality TV shows are just like real life.<br>4) I read about RTV shows in newspapers. | 1) I would attend a public appearance if my favorite RTV character from the show were there.<br>2) I watch other programs that include contestants from the RTV show.<br>3) RTV is just like real life.<br>4) I read about RTV in news papers. |
| | c) Attention (Perse 1998; Yoon & Garma 2006) | 1) I imagine how I would act in a similar situation shown on RTV shows.<br>2) I pay close attention when I change TV channels. | 1) I imagine how I would act in a similar situation shown on RTV.<br>2) I pay close attention when I watch RTV. |
| | d) Desire towards RTV (Dolliver 2006) | 1) I wish I could be on reality TV shows. | 1) I wish I could be on RTV shows.<br>2) I wish to watch RTV on the internet (New scale from FGI). |

## ASSESSMENT OF MEASUREMENT SCALES

Factor analysis was applied using principal component analysis extraction and varimax rotation methods. Measurement items of RTV involvement created two factors with acceptable co-efficient alpha value. Factor 1 has four items of involvement each with factor loading of more than .50 that strongly relate to the domain of attention towards RTV. Co-efficient alpha of this factor was .71. Whereas, factor 2 relating to the domain of desire to getting involved with RTV has 5 variables with factor loading of more than .50. This factor has the co-efficient alpha of .70. Table 3 shows the retained factors and their measurement variables for further analysis. To test reliability of each set of factors co-efficient Alpha was used. Each retained constructs/factors achieved more than Alpha .70 as recommended by Hair et al. (2006).

Uni-dimensionality is defined as the existence of one construct underlying a set of items (Garver & Mentzer, 1999). It is the degree to which a set of items represent one and only one underlying construct. In this study RTV involvement is multi-dimensional at EFA stage as most of its measurement items strongly related to two measurement domains i.e. attention towards RTV and desire towards RTV. However, the current RTV involvement literature shows these two domains are part of the single construct (Perse, 1998; Pecheux & Derbiax, 2002; Yoon & Garma, 2006). Further, as suggested by Tabachnick and Fidell (2001) that the SEM model has to be driven by theory rather than survey data. Also, a test run combining these 2 factors as

measurement items of RTV involvement shows .77 co-efficient alpha. Therefore, in the subsequent analysis using CFA these measurement items have been considered as common items for the underlying construct, RTV involvement.

**able 3**
**Factors, Variables and Factor Loading of RTV Involvement**

| Variables | Factor 1 | Factor 2 | % Variance Extracted | Co-efficient Alpha | Inter-item Correlation |
|---|---|---|---|---|---|
| Pay attention to RTV (Inv 2 | .752 | | 53. 72 | .71 | .579 |
| RTV from news papers (Inv 3) | .735 | | | | .622 |
| Watch RTV (Inv 1) | .726 | | | | .595 |
| Watch other programs relate to RTV celebrities (Inv 6) | .582 | | | | .653 |
| RTV on web (Inv 9) | | 766 | 45. 43 | .70 | .598 |
| RTV like real life (Inv 8) | | .686 | | | .629 |
| Wish to attend RTV (Inv 7) | | .670 | | | .685 |
| RTV with public appearances (Inv 4) | | .531 | | | .513 |
| Imagine about RTV shows (Inv 5) | | 513 | | | .561 |

## CONFIRMATION OF MEASUREMENT SCALES

RTV involvement has been measured by nine observed variables. Measurement items of 'RTV Involvement' have initially been adapted from current literature and subsequently refined through qualitative research findings. Further, the items were tested using EFA. However, at the EFA stage 'RTV Involvement' reflected in to two different factors relating to the domain of 'attention' and 'desire' towards RTV but at the CFA stage these two factors have been considered as a common factor of 'RTV Involvement' construct as they are strongly supported by the existing literature as one construct. The results of CFA of the measurement items of the 'RTV Involvement' are summarised in Table 4.

In Table 4, regression weight refers to the un-standardized parameter estimates for the factor loadings. No critical ratios (t-values) are stated for the first factor loadings of RTV involvement and pay attention to RTV were fixed to unity to scale the latent variables. All remaining factor loading were significant. Table 5 shows the standard regression weights, goodness-of-fits and composite reliability of RTV involvement.

**Table 4**
**Regression Weights of RTV Involvement**

| *Regression Weights* | | Estimate | S.E. | C.R. | P value |
|---|---|---|---|---|---|
| Pay attention to RTV | | 1.000 | | | |
| RTV from news papers | <--- | 1.069 | .135 | 7.909 | 0.000 |
| Watch RTV | <--- | .912 | .114 | 7.988 | 0.000 |
| Watch other programs relate to RTV celebrities | <--- | 1.132 | .133 | 8.486 | 0.000 |

**Table 4**
**Regression Weights of RTV Involvement**

| *Regression Weights* | | Estimate | S.E. | C.R. | P value |
|---|---|---|---|---|---|
| Pay attention to RTV | | 1.000 | | | |
| RTV on web | <--- | .900 | .140 | 6.422 | 0.000 |
| RTV like real life | <--- | .695 | .111 | 6.269 | 0.000 |
| Wish to attend RTV | <--- | 1.236 | .149 | 8.289 | 0.000 |
| RTV with public appearances | <--- | 1.049 | .144 | 7.292 | 0.000 |
| Imagine about RTV shows | <--- | 1.050 | .132 | 7.955 | 0.000 |

As shown in Table 5, coefficient alpha for RTV involvement of CFA model is .78, indicating that the variables are a reasonable measure of RTV involvement. Results show that all the nine items except two have standardized regression weight more than 0.5. Moreover, goodness-of-fit indices also indicate that the model fitted data well, with GFI, AGFI, NFI, TLI, RMSEA and CFI all within acceptable level. Composite reliability .90 also indicates the reliability of the underlying variables of 'RTV Involvement'.

**Table 5**
**Standard Regression Weights, Goodness-of-Fits Estimates and Composite Reliability of RTV Involvement**

| | | RTV Involvement | |
|---|---|---|---|
| *Standardized Regression Weights* | | Estimate | Composite Reliability |
| Pay attention to RTV | <--- | .577 | .90 |
| RTV from news papers | <--- | .528 | |
| Watch RTV | <--- | .520 | |
| Watch other programs Relate to RTV celebrities | <--- | .619 | |
| RTV on web | <--- | .443 | |
| RTV like real life | <--- | .423 | |
| Wish to attend RTV | <--- | .636 | |
| RTV with public appearances | <--- | .503 | |
| Imagine about RTV shows | <--- | .567 | |
| Regression Factors | | | |
| Reliability-Cronbach alpha α | | 0.78 | |
| Chi-Square | | 105.914 | |
| Degree of freedom | | 27 | |
| P | | .000 | |
| Normed Chi-Square (CMIN/DF) | | 3.923 | |
| Root mean square residual (RMR) | | .259 | |
| Root mean square of error of estimation (RMSEA) | | .089 | |
| Goodness of fit index (GFI) | | .931 | |
| Adjusted of goodness-of-fit index (AGFI) | | .885 | |
| Normed fit index (NFI) | | .845 | |
| Tucker-Lewis Index (TLI) | | .837 | |
| Comparative fir index (CFI) | | .878 | |

## CONCLUSIONS, IMPLICATIONS AND FUTURE RESEARCH

In this research a widely used multi-step process of developing measurement scales of marketing constructs have been followed. After initially, identifying the measurement items of RTV involvement from the current literature, the same were refined and adapted for a developing country through qualitative research. These scale items were then tested using two-stage quantitative measures resulting in the confirmation of a nine-item measurement scale for the developing country teenagers' RTV involvement. Table 6 shows the tested nine-tem scale.

**Table 6**
**Multi-item Measurement Scale of Teenagers' RTV Involvement**

| Construct | Measurement Items |
|---|---|
| RTV Involvement | 1. I watch RTV<br>2. I pay close attention when I watch RTV<br>3. I read about RTV in news papers<br>4. I would attend a public appearance if my favorite RTV character from the show were there<br>5. I imagine how I would act in a similar situation shown on RTV<br>6. I watch other programs that include contestants from the RTV show<br>7. I wish I could be on RTV shows<br>8. RTV is just like real life<br>9. I wish to watch RTV on the internet |

This research has identified and tested the multi-item measurement scale for the construct developing country teenagers' RTV involvement. These measurement items can now form the basis for various further research, particularly on developing country teenagers' RTV involvement and its effect on their consumption behavior.

Understanding consumers' taste and preferences is the key issue for any marketer. Most of the international and local businesses give maximum priority and effort to understanding customers' consumption behaviour through consumption related cognition, attitudes and values. Accordingly, the findings of this research will be of interest to brand marketers and marketing communication planners in Bangladesh and other developing countries. Further, market communication planners can also consider teenagers way of involvement with RTV that might be helpful for reaching their target customers. Media strategist and sponsors also can get a clear indication of what are the different ways that teenagers get involved with RTV, which might be fruitful for their marketing strategies.

This research has been conducted in Bangladesh only. There are so many other developing countries in the world. As only one of the developing countries, Bangladesh does not represent all the economic and cultural indicators of all the developing countries. Accordingly, the findings of this research may not be treated as completely applicable to the rest of the developing countries, and needs to be tested further from the perspective of individual countries.

This research has the potential to open up a new area of empirical research. Particularly, findings from this research are relevant only for the TV vehicle, RTV. RTV being a most

contemporary vehicle in the electronic media area, such findings may or may not be representative of other TV vehicles. Further research is required to re-test such scales for possible refinement and future usage for other media studies and confirm its applicability.

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# THE EFFECT OF CULTURAL ORIENTATION ON ADVERTISING EFFECTIVENESS. A COMPARISON AMONG AMERICANS, MEXICAN-AMERICANS, AND MEXICANS

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## ABSTRACT

*The purpose of this paper is to investigate the effect that cultural orientation has on advertising effectiveness. The samples are extracted from three different populations: Americans, Mexicans, and Mexican-Americans. A total of 331 usable questionnaires were gathered. Results show that cultural elements in advertising don't have significant impact on advertising effectiveness for neither the American nor the Mexican populations; however, for the Mexican-American population with high Mexican cultural orientation, Mexican cultural elements in advertising have a significant positive effect in advertising effectiveness.*

## INTRODUCTION

Cultural and national artifacts or elements have become an important economic and marketing attraction (Edson, 2004). Nations and cultures all over the world are gaining importance, not only for the tourism industry, but for the experiences related to different cultures in which people might live. Indeed, cultures survive as long as they have marketable elements that are attractive to be consumed (Firat, 1995).

As members of a community, people have a sense of identification with one or more countries and with one or more cultures (Deshpande et al, 1986; Whittler et al, 1991). The way this sense of identification or belongingness to a community is acquired is beyond the scope of this study; however there is a common believe that this is done by socialization. It is noticeable that we can have more than one citizenship. It is also true that we can identify with more than one culture. The main focus of this paper is to explore how these cultural elements might impact advertising effectiveness.

In advertising, culture-related elements have been used extensively. It is common to observe on TV ads the countries' flags, national sport heroes as spokesmen, and other cultural elements, such as traditions and cultural practices. However, there is no formal study in marketing literature where cultural orientation is considered. By considering not only culture, but also cultural orientation, this paper will shed light on the understanding of the use of cultural

elements in ads and how different communities that live in the US can be targeted more effectively.

We are assuming that Americans have American cultural orientation, and Mexicans have Mexican cultural orientation. For the Mexican-American community, we use scale ARSMA (The Acculturation Rating Scale for Mexican-Americans) developed by Cuellar et al. (1995). This scale contains two subscales that measure AOS (American orientation subscale) and MOS (Mexican orientation subscale) of 6 items each.

The importance that this study has for marketing is high. For advertisers, the results of this study will give insights about the proper way to use cultural elements in advertising to ensure effectiveness, and for academicians, this study opens a new stream of research on culture and cultural orientation.

## LITERATURE REVIEW

In marketing literature, there has been some research about cross cultural studies related with advertising. For example, Callow and Shiffman (2004) studied print advertising between high and low context cultures. Also the effectiveness of comparative vs. non-comparative advertising has been studied in a cross-cultural settings (Jeon and Beatty, 2002; Shao et al, 2004). Furthermore, there are comparisons between advertising from the US and other countries like Britain (Caillat and Mueller, 1996), Japan (Mueller, 1987), China (Lin, 2001; Zhang and Neelankavil, 1997), and Hispanic/Mexican advertising (Roberts and Hart, 1997).

Similarly, cultural studies deal with the national identities reflected in advertising. Examples include Thai identity (Jory, 1999), Canadian identity (Macgregor, 2003), and Russian identity (Morris, 2005). Also, other studies deal with the effect of language, for example Koslow et al (1994) studied the effect of the Spanish language as an important element for identification as Hispanic. In another study, Webster (1992) studied the effect of Hispanic subculture identification with the information search behavior.

In conclusion, there are studies that compare advertising effectiveness of different countries. Also the research about Mexican-American population has been investigated. However, there is no study that makes a comparison on the effectiveness of cultural orientation when people are exposed to cultural stimuli. So, by comparing the three populations (American, Mexican-American, and Mexican), this study contributes to this important aspect of advertising.

## HYPOTHESES DEVELOPMENT

### Congruency

Congruency is the consistency that the self-identification has with the stimuli. Many aspects have been researched. For example, Gregory and Munch (1997) studied consistency in

roles and cultural norms and the effect it has on viewers. They argue that the reactions are more favorable than for ads that depict inconsistencies, indeed, inconsistencies elicit adverse effects on attitudes toward the ad (Shen and Chen, 2006).

Another example is given by Holland and Gentry (1997), where stronger identification with the group will elicit stronger affective responses to the use of cultural symbols in advertising. Furthermore, matching characters with viewers' ethnicity would elicit more favorable response toward the ad (Torres and Briggs, 2005).

Some results are based on the theoretical perspectives of the elaboration likelihood model (Cacioppo and Petty, 1984). According to this model, there are two routes of perception: the central and the peripheral. Congruencies in advertising with the viewers are processed though the peripheral route such that the affection is transferred directly toward the ad judgment (Leach and Liu, 1998).

Not only has the affective reaction to congruency been researched: the impact or effect that these congruencies have on advertising has also been studied. Self-identification as a group member gives a sense of belonging to the group and contributes to a positive self-concept (Phinney, 1990). Cultural congruency appeals (collectivist vs. individualistic) are more effective (Zhang and Gelb, 1996), although the product-use condition moderates the effectiveness of culturally incongruent advertising appeals.

Congruency with the ethnicity of salespersons affect brand attitude positively (Grier and Deshpande, 2001). Congruency between the ad message and music also leads to an increase in brand recall (Shen and Chen, 2006). Furthermore, congruencies with the model and language with the viewer positively affects advertising effectiveness (Ueltschy and Krampf, 1997). This leads to the next hypothesis:

> ***H1a**: Advertising stimuli having American cultural elements would elicit more positive reactions to Americans than advertising having other cultural elements.*
>
> ***H1b**: Advertising stimuli having Mexican cultural elements would elicit more positive reactions to Mexicans than advertising having other cultural elements.*

Cuellar et.al. (1995) developed the ARSMA (Acculturation Rating Scale for Mexican-Americans) scale to measure the American and Mexican levels for Mexican-Americans. This scale is needed in this study to obtain these two important orientations that Mexican-Americans may have. The acculturation level, then is defined as the extend to which subjects exhibit the two types of orientation.

For the case of Mexican-Americans, acculturation level is a key element in advertising effectiveness. It was found that highly acculturated Mexican-Americans tend to have more similarities with the American population in advertising preferences (Uelschy and Krampf, 1997; Uelschy, 2002). This presides the basis for the next hypotheses:

***H2a**: Advertising stimuli congruent with Americans as a culture would elicit more positive reactions for Mexican-Americans with a high American orientation level than advertising stimuli congruent with Mexicans as a culture.*

***H2b**: Advertising stimuli congruent with Mexicans as a culture would elicit more positive reactions for Mexicans-Americans with a high Mexican orientation level than advertising stimuli congruent with Americans as a culture.*

## Advertising effectiveness

This section refers to the effectiveness of advertising in relation with cultural orientation. Since cultural elements elicit positive feelings, people would have more positive reaction toward the ads that contain congruent cultural elements, and thus advertising would be more effective.

As was mentioned before, self-identification as a group member gives a sense of belonging to a group and contributes to a positive self-concept (Phinney, 1990). When advertising elicits this sense of belonging and value, then a sense of pride is elicited. As a positive feeling, the reaction toward the ad and other ad effectiveness such as attitude toward the product and purchase intention are influenced positively on the impact of the ad. Some studies have reported positive responses to ads when positive feelings are elicited. For example, Aaker et al (1986) studied the impact of warmth in advertising. Warmth is a positive emotion very related with happiness and pride (Smith and Ellsworth, 1985).

In another study involving the role of emotions in advertising, Holbrook and Batra (1987) find the importance of emotions as mediators of responses to advertising. The responses are measured using attitude toward the ad and attitude toward the brand. They suggest pride as an emotional index that generates pleasure and is related with superiority and worth, such that positive emotions impact advertising effectiveness positively.

The use of cultural symbols has been researched as well. Holland and Gentry (1997) propose the Theory of Intercultural Accommodation to explain the effect of the usage of cultural symbols in advertising. That theory posits that there are both cognitive and affective responses to cultural symbols in advertising. The cognitive can either be positive, if the recipient perceives the cultural symbol handled with respect, or negative, if the recipient sees it as manipulative. The other type of response is affective, and people who identify stronger with the ethnic group of the ad actor, have stronger affective response and the ad is better evaluated.

The previous discussion leads to the conclusion that positive feelings impact advertising effectiveness positively. Hence, since cultural pride is a positive feeling, this study hypothesizes:

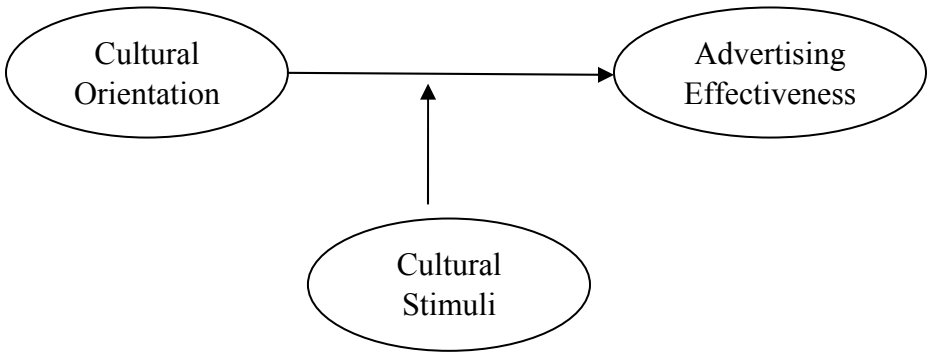
***H3a**: There is a positive relation between cultural orientation and attitude toward the ad when stimuli are present.*

***H3b**: There is a positive relation between cultural orientation and attitude toward the product/service when stimuli are present.*

***H3c**: There is a positive relation between cultural orientation and purchase intention when stimuli are present.*

Figure 1 describe the posit relationship of the variables in this study.

**Figure 1. Summary of the Model**




## METHODOLOGY

### Definition and Operationalization of Variables.

**Attitude Toward the Ad**- is defined as the predisposition to respond in a favorable or unfavorable manner toward the advertisement after being exposure to it. This construct is operationalized by using a scale used in previous research studies. This study took the scale from the research made by Neese and Taylor (1994) using a 7-point Likert scale from strongly agree to strongly disagree, including items such as offensive, useful, and convincing.

**Attitude Toward the Product/Service**- is defined as a predisposition to respond in a favorable or unfavorable manner toward the product after being exposed to an advertising stimulus. To operationalize this construct this study combined two already used scales in marketing literature made for this purpose. The scale consists of a series of 7-point bipolar scale with items selected from two sources. One is from Holbrook and Batra (1987) that include items such as good/bad and positive/negative. The other source is from Peracchio and Meyers-Levy (1997) that include items such as boring/exciting and exceptional/mediocre.

**Purchase Intention**- is defined as the actual intention of the subject to purchase the product. The measurement is done by asking a single question in the questionnaire, "If you could, would you buy this product?" with a 7-point Likert scale (Not at all – Definitely).

**Cultural Orientation**- Since acculturation is defined as the process of learning a culture that is different from the one in which a person was raised (Valencia, 1985), then the acculturation level is the stage where the person is in that process. To operationalize this construct, this study uses the scale ARSMA (The Acculturation Rating Scale for Mexican-Americans) developed by Cuellar et al. (1995). This scale contains two subscales that measure AOS (American Orientation subscale) and MOS (Mexican Orientation subscale) of 6 items each.

For the Mexican community, this study assumes that they have Mexican cultural orientation. In the same way, Americans have American cultural orientation

**Description and Selection of the Sample**

In order to make the comparison among the three populations (American, Mexican-American, and Mexican) this study needs data from the three groups. The American population should be selected from a town where the majority of the population is American and their contact with Mexican culture is limited (e.g.Georgia). The Mexican population, in the same way, should be from a Mexican town where the American culture is not determinant (e.g. Monterrey). And finally, the Mexican-American sample should be selected from a town where the majority of the population is from that culture (e.g. a Rio Grande Valley town in South Texas).

In order to assure equal samples from the three populations, college students were used as subjects in the experiment. By using a classroom setting, the study has more control of the variance of the experiment and avoids extraneous variables. In Mexico, the sample selected need to have enough English domain to perform the test in that language. Both the ads and the questionnaires are in English. In order to obtain that sample, this study selected a university that requires that its students get a minimum of 550 points in the TOEFL test, this assures that the subjects would have enough knowledge of the English language to perform the experiment.

**Experiment Design**

In each university, different classes were approached, and each group was exposed to only one of the commercials that contain either American or Mexican cultural elements. Since the experiment was done at different class times, those students that participated before, were asked not to do the experiment again.

**Statistical Analysis**

The hypotheses are about the comparison among the populations. For comparing the differences on the populations, ANOVA is the proper statistical technique to use with a post-hoc analysis to identify where the exact differences are (Hair et al, 1998).

In order to test the effect of cultural orientation on advertising effectiveness, regression analysis and the correlation matrix were used to verify if, statistically, there is significant evidence that cultural orientation impact on advertising effectiveness. The three variables to test the effectiveness of the advertising are: attitude toward the ad, attitude toward the product/service, and purchase intention. Such that cultural orientation would be the independent variable and each one of the three effectiveness variables would be the dependent variables.

# RESULTS

## Data gathering process

This study was designed to examine the effect of culture in advertising effectiveness. In order to conduct the experiment, selected advertisements were exposed to different classes in a normal classroom in three different universities. The universities selected were considered such that the majority of the students belong to the three samples that this study intends to compare. The three samples are Americans, Mexicans, and Mexican-Americans.

In each one of the universities, subjects were approached to conduct the experiments in a normal classroom. A total of 331 usable questionnaires were gathered. The distribution of the samples is presented on table 1.

**Table 1**
**COMPOSITION OF THE SAMPLE**

| | SAMPLE | | | |
|---|---|---|---|---|
| **Region that Ad covers** | **American** | **Mexican** | **Mexican-American** | **TOTAL** |
| USA | 41 | 61 | 61 | 163 |
| Mexico | 43 | 49 | 76 | 168 |
| **TOTAL** | **84** | **110** | **137** | **331** |

## Description of the data

Table 2 shows some of the descriptive for the data. This table includes all the demographic variables that were collected.

**Table 2**
**Demographic Data by Sample**

| | | Sample | | |
|---|---|---|---|---|
| **Variable** | **Descriptive** | **American** | **Mexican** | **Mexican-American** |
| Age | Min | 19 | 18 | 19 |
| | Max | 50 | 55 | 48 |
| | Mean | 23.1 | 20 | 24.5 |
| Gender | Male | 44 | 63 | 55 |
| | Female | 40 | 47 | 82 |
| Occupation | Student | 51 | 102 | 87 |
| | Other beside student | 33 | 8 | 50 |

## Analysis of Results

For each one of the samples, some statistical analysis was made in order to test the hypotheses. These analyses include ANOVAs and Regression Analysis. The software used for this purpose was SPSS.

The first set of hypotheses consists of comparing advertisements having stimuli from different regions (Mexico and the USA). To test differences, ANOVA was used. In order to test positive reactions about the advertisements, this study used the three variables: purchase intention (PI), attitude toward the ad (AttAd), and attitude toward the product (AttPr).

For the American sample, it is expected that stimuli congruent with the USA would have more positive reaction than the other ads that contain elements form Mexico. As presented in the first section of tables 3a and 3b, this study finds that the only variable in which the different regions differ is purchase intention, but in the opposite direction as expected. This evidence did not support H1a.

For the Mexican sample, this study did not find evidence that Mexican elements in the ads would promote more positive reactions than ads having stimuli from the USA. This is shown on the second section of tables 3a and 3b, hence hypothesis H1b is not supported.

Hypothesis H2a posits that Mexican-Americans with high American orientation would evaluate ads containing American elements better than ads containing elements from Mexico. In this case, the results show that that the differences are presented in the three variables, however in the opposite direction than expected. The third section of tables 3a and 3b show these results, hence H2a is not supported.

Hypothesis H2b posits that Mexican-Americans with high Mexican orientation would evaluate ads containing Mexican elements better than ads containing elements from the USA. This study finds that this happens for purchase intention and attitude toward the product, but not for attitude toward the ad. The last section of tables 3a and 3b shows these results, hence H2b is partially supported.

**Table 3a**
**ANOVA Results for Differences in Ad Evaluation Among the Ads Regions**

| | **Variables** | | |
|---|---|---|---|
| **Sample** | **PI** | **AttPr** | **AttAd** |
| American | .017 (opposite) | n.s. | n.s. |
| Mexican | n.s. | n.s. | n.s. |
| Mexican-American with high AOS | .002 (opposite) | .005 (opposite) | .001 (opposite) |
| Mexican-American with high MOS | .045 | n.s. | .043 |

**Table 3b**
**Post-Hoc Results from the ANOVA Table (Only Significant Results Shown)**

| Sample | Variable | (I) | (J) | Mean Diff. (I-J) | Sig. |
|---|---|---|---|---|---|
| American | PI | American | Mexican | -1.01 | .034 |
| Mexican | - | | | | |
| Mexican-American with high AOS | PI | American | Mexican | -1.11 | .003 |
| | AttPr | American | Mexican | -.6813 | .006 |
| | AttAd | American | Mexican | -.6674 | .006 |
| Mexican-American with high MOS | PI | Mexican | American | .88 | .064 |
| | AttAd | Mexican | American | .5174 | .099 |

The last sets of hypotheses are related with the relationship between cultural orientation and advertising effectiveness in the variables purchase intention, attitude toward the product, and attitude toward the ad. Regression analysis is used to verify if there is a significant relationship of dependence between two variables. Table 4 shows the results of these tests. For the Mexican-American sample, we split the sample in two files. One contains subjects with high Mexican Orientation (MOS) and the other contains subjects with high American orientation (AOS). Furthermore, the selection of those ads in each one of the samples that represent their culture need to be done to assure that the correct analysis is performed with the correct data. In summary, for the Mexican sample and for the Mexican-American sample with high MOS, this study used only the evaluation of the Mexican commercials in the analysis; and for the American sample and the Mexican-American sample with high AOS, this study used only the cases where subjects evaluate the American commercials. H3a posits that there is a positive relationship between cultural orientation and attitude toward the ad (AttAd). The numbers on table 4 show that only in the Mexican-American sample with high Mexican orientation this is true, hence partially supporting H3a. Similarly, H3b posits that there is a positive relationship between cultural orientation and attitude toward the product. By looking table 4, it can be seen that this is true only for the two Mexican-American samples, hence partially supporting H3b. Last, H3c posits that there is positive relationship between cultural orientation and purchase intention, table 4 shows that this happens only with the two Mexican-American populations, such that H3c is partially supported.

In this table it can be seen that the only case where cultural orientation has a significant effect on the independent variables (i.e. purchase intention, attitude toward the ad, and attitude toward the product) was in the Mexican-American subsamples, in both the American orientation and the Mexican orientation subsamples. In the other samples (American and Mexican) cultural orientation was not determinant for these variables.

**Table 4**
**Regression Analysis with the Relationship Between Cultural Orientation and Advertising Effectiveness (Purchase Intention, Att Toward the Ad, and Att Toward the Product)**

| Sample | Considering only ads from | Variable | Sig. | R | R square | Adj. R square |
|---|---|---|---|---|---|---|
| American | USA | PI | n.s. | | | |
| | | AttAd | n.s. | | | |
| | | AttPr | n.s. | | | |
| Mexican | Mexico | PI | n.s. | | | |
| | | AttAd | n.s. | | | |
| | | AttPr | n.s. | | | |
| Mexican-American with high AOS | USA | PI | .100 | .282 | .080 | .046 |
| | | AttAd | n.s. | | | |
| | | AttPr | .010 | .394 | .115 | .124 |
| Mexican-American with high MOS | Mexico | PI | .044 | .331 | .109 | .076 |
| | | AttAd | .012 | .390 | .152 | .121 |
| | | AttPr | .034 | .343 | .118 | .085 |

## DISCUSSION, IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

### Discussion of the results

The main objective of this study was to compare three different populations (Mexican, American, and Mexican-American) in the way cultural orientation influences the effectiveness on TV advertising.

The first set of hypotheses is about cultural congruency. A high surprisingly result was obtained in the hypotheses that deal with cultural advertising stimuli congruent with the subjects own identity. Even when prior research (e.g. Gregory and Munch, 1997; Shen and Chen, 2006; Torres and Briggs, 2005) find evidence that people evaluate more positively ads congruent with their own culture, this study did not find support on this. The Americans did not evaluate more positively the ads that contain American cultural elements; neither the Mexicans evaluate more positively the ads that contain Mexican cultural elements. The cause may be again the sample selection. However, it can also be that indeed, cultural elements do not affect the evaluation of TV ads. People is more used to watch TV ad made for international advertising campaigns and the use of particular cultural or national elements may tend to influence now in smaller proportion. Beside, there are some other important elements that may be considered more important is ad evaluation, especially for young people, such as resolution, image, creativity, and so on.

An important finding of the study was the evidence that ads with Mexican elements have more positive effects for the Mexican-Americans that have high Mexican orientation (MOS). Surprisingly, the opposite did not find any support. Ads containing American elements did not have a positive effect in the Mexican-Americans high in American orientation (AOS), indeed,

they have a negative effect on the dependent variables. This may be cause by the fact that Mexican-Americans with high MOS that are away from Mexico may cause this positive effect when exposed to Mexican elements in TV ads. The Mexican-Americans high in Anglo orientation follow the same pattern of the Americans and the Mexican samples, in the fact that American cultural elements in ads are not evaluated more positively than the rest of the TV ads. It may be possible to consider that no matter the cultural orientation, the Mexican-American community may be influenced by Mexican cultural stimuli in advertising. This may be an important finding that only Mexican-Americans evaluate more positively the ads that contain Mexican cultural elements. This finding may be determinant on the advertising campaigns directed to a specific sub-culture that is away from what they might consider their "home country".

The last set of hypotheses is about advertising effectiveness. The variables that this study considers to measure the effectiveness of the advertising are: attitude toward the ad, attitude toward the product, and purchase intention. For these hypotheses this study suggests a positive relationship between cultural orientation and these variables. This study found that only in the Mexican-American sample the impact of cultural orientation on advertising effectiveness (attitude toward the ad, attitude toward the product, and purchase intention) was significant. Again, it can be caused by the sample selection or it may be cause by other factors that affect the evaluation of the ads. And only in the population with cultural diversity, these cultural elements are influential. This finding is congruent with the finding that only the Mexican-American population is influenced by their cultural orientation. Again, this is a very important finding when targeting a sub-culture immerse in another country.

**Limitations and Future Research**

Even when the findings of this study are important, much more research needs to be done in order to verify the findings. The main limitation of this study is the sample selection. By using college students in a regular classroom this study assures high internal validity since extraneous variables were more under control and minimizing the effect of the results. However, external validity is jeopardized. The results cannot be generalized to the whole population. This suggests that further research need to be done by considering a non-student sample with higher age and occupations variability.

The selection of the ads is a limitation of this study as well. Evan when the selection of the ads was made by a panel of experts, this study did not have control on the product type or on the specific cultural elements that the ads contain. As future research, the author recommends to prepare the TV ads for this specific purpose to have more control on extraneous variable that this study did not controlled.

Another important consideration for future research is to select samples form other cultures, such as Asian-American or other Hispanic subcultures to verify if the results are

congruent with the results of this study. This may open new insights in the way advertising to subcultures may be target worldwide.

And last, this study suggests that some other variables may be considered in the analysis as well. These variables were not considered in this study, but may be determinants of cultural orientation. These variables can also affect the way cultural orientation affect advertising effectiveness. These variables include the time that the subject has been in the USA or the generation that the subject belong (first generation, second generation, and so on) as part of the assimilation measurement.

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# THE EFFECTS OF INFORMATION PRIVACY AND ONLINE SHOPPING EXPERIENCE IN E-COMMERCE

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## ABSTRACT

*The purpose of this study was two-fold: 1) to investigate the effect of e-tailer information privacy policy on customers' privacy concerns and their perceptions of the e-tailer trustworthiness and 2) to examine the effect of consumers' online shopping experience on their reactions to the e-tailer's privacy policy. The empirical results showed that consumers' privacy concerns partially mediate the effect of information privacy policy on e-tailer trustworthiness. These findings suggest that information privacy may play a dual role in shaping customers' perceptions of e-tailer trustworthiness: 1) indirectly - by informing customers about the intended uses for their personal information and thus reducing their privacy concerns and 2) directly - by serving as a signal of the e-tailer's integrity and general concern for customers' well-being. In addition, we emphasize the importance of considering consumers' experience with online shopping when studying their privacy perceptions online. In our study, more experienced online shoppers demonstrated lower privacy concerns and appeared to have a stronger response to the e-tailer's privacy policy than less experienced online shoppers.*

## INTRODUCTION

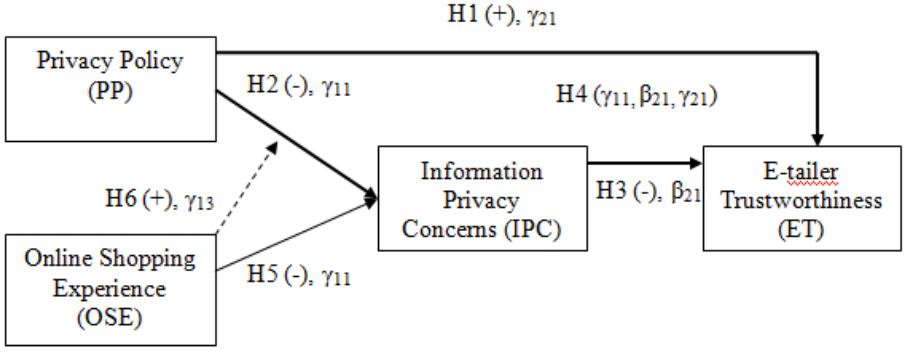
For a decade information privacy has been one of the central issues in e-commerce research across many disciplines. Extensive research has shown that due to a different nature of shopping environment, consumers perceive online transactions as risky, form heightened privacy concerns and such concerns become the main barrier for electronic commerce (Hoffma, Novak & Peralta, 1999). In marketing, information privacy has been linked to online trust (Bart et al., 2005; Eastlick et al., 2006; Hoffman et al., 1999; Pan & Zinkhan, 2006), e-service quality (Zeithaml et al., 2002), and online purchasing (Malhotra et al., 2004). Some researchers have examined the antecedents of e-shoppers' privacy perceptions, advocating various privacy management strategies such as opt-in/opt-out tactics, monetary compensation for customer information, and third-party privacy seals (Culnan, 1995; Goodwin, 1991; Rifon et al., 2005). In this study we will investigate yet another privacy management strategy that focuses on the transparency of the e-tailer's consumer information practices.

The supporters of the *transparency* strategy argue that customers would be more willing to trust the e-tailer with their personal information if the e-tailer explained the intended uses of customer information (Hoffman et al., 1999; Pan & Zinkhan, 2006). This view suggests that the mere transparency of the e-tailer's information practices can reduce customers' privacy concerns and enhance their perceptions of the e-tailer trustworthiness. However, research shows that many consumers either do not read or do not fully comprehend e-tailers' information privacy policies thus raising questions about their effectiveness in reducing customers' information privacy concerns (Cranor et al., 2006; Meinert et al., 2006; Milne & Culnan, 2004; Milne et al., 2006; Vail et al., 2008, Nehf, 2007; Proctor et al., 2008). Furthermore, little if anything is known about the effect of customers' previous online shopping experience on their reactions to the e-tailer's information privacy policy. Is it effective for all customers regardless of whether they are novice or experienced online shoppers? While Bart et al. (2005) show that both a consumer's Internet shopping experience and the website privacy policy have a positive influence on e-trust, we have not found any research that looked at the interaction between these two variables. This study will attempt to address these issues by specifying a structural equation model where customers' perceptions of e-tailer's information privacy policy, their online shopping experience, and the interaction of these two variables are explicitly linked to their privacy concerns and their perceptions of e-tailer trustworthiness.

## THEORETICAL FRAMEWORK

This section is organized as follows. First, we will define online trust and explain conceptual underpinnings of e-tailer trustworthiness, which is the focal dependent variable in this study. Then we will discuss the hypothesized relationships among customers' perceptions of e-tailer information privacy policy, their online shopping experience, their privacy concerns, and their perceptions of e-tailer trustworthiness. Figure 1 depicts the research model.

**FIGURE 1: Research Model**



## Online Trust vs. Trustworthiness

Online trust has been defined in literature as a person's willingness to accept vulnerability based on positive expectations about the e-tailer's intentions and behaviors (Rousseau et al., 1998). These positive expectations encompass the customer's perceptions of the website's competence in performing required functions and his or her perceptions of the firm's good intention behind the "online storefront" (Bart et al., 2005). In other words, online trust is a behavioral outcome of a customer's belief in the e-tailer trustworthiness. It is important to distinguish between trust (behavior: i.e., willingness to depend) and perceived trustworthiness (cognition: i.e., beliefs about trustee's integrity, competence, and benevolence). Despite their conceptual differences, these two constructs have been often used interchangeably as the following definitions of trust show: the willingness of one party to be subject to risks brought by another party's actions (Gambetta, 1988); the belief that e-tailer will not "behave opportunistically by taking advantage of the situation" (Gefen et al., 2003, p. 54); a belief that the seller has integrity, competence, and benevolence (Bhattacherjee, 2002; Doney & Canon, 1997; McKnight et al., 2002) and one's willingness to accept vulnerability based on positive expectations about the other party's intentions or behaviours (Rousseau et al., 1998). Yet research shows that the three trustworthiness dimensions (integrity, competence, and benevolence) have different behavioral outcomes, making a plausible case for separating trust and trustworthiness (Gefen et al., 2003). In our study, we will examine e-tailer trustworthiness, defined in terms of the e-tailer's dependability, competence, integrity, and responsiveness. This choice of construct is justified by the purpose of the study, which is to examine the changes in customers' perceptions of an e-tailer resulting from the e-tailer's privacy policy strategy and customers' general experience with shopping on the Internet.

## The Effects of Information Privacy Policy

Consistent with the principles of the social contract theory (Dunfee et al., 1999), consumers enter into a social contract with a company every time they provide their personal information (Culnan, 1995; Milne & Gordon, 1993). In exchange, they expect the firm to uphold their rights to limit the accessibility and to control the release of their personal information. The company's failure to fulfil its obligations in regard to customers' information privacy results in a breach of social contract and erosion of trust. Consequently, social contract theory suggests that consumers' decision to purchase from an online firm depends on their perceptions of the firm's privacy practices, which can be gleaned from its privacy policy statement.

Privacy disclosures posted on the e-tailer's website may have both direct and indirect effects on consumers' perceptions of e-tailer trustworthiness. On the one hand, the information provided in these disclosures may address specific consumer concerns in regard to the firm's handling of their personal information thus resulting in lower privacy concerns (Campbell, 1997;

Gengler & Leszczyc, 1997; Hoffman et al., 1999; Culnan & Armstrong, 1999). In turn, lower privacy concerns are likely to produce more favorable perceptions of e-tailer trustworthiness (Okazaki et al., 2009). At the same time, a privacy statement may serve as a signal of the firm's concern with its customers' well-being thus also having a positive impact on perceived e-tailer trustworthiness (Pan & Zinkhan, 2006). Hence, we posit the following hypotheses:

*H1: Consumers' perceptions of the e-tailer privacy policy have a positive influence on their perceptions of the e-tailer trustworthiness.*

*H2: Consumers' perceptions of the e-tailer privacy policy have a negative influence on their privacy concerns.*

*H3: Consumers' privacy concerns have a negative influence on their perceptions of the e-tailer trustworthiness.*

*H4: The effect of consumers' perceptions of privacy policy on their perceptions of the e-tailer trustworthiness is partially mediated by consumers' privacy concerns.*

**Online Shopping Experience**

General online shopping experience is likely to influence consumers' privacy concerns. To begin with, novice online shoppers have limited knowledge of the industry information practices, causing greater anxiety over their information privacy (Hoffman et al., 1999). In addition, research suggests that even experienced online shoppers tend to overestimate their knowledge of the Internet technology, including e-tailers' use of cookies to monitor customers' shopping behavior. For example, Jensen et al. (2005) found that 90.3% of experienced Internet users exhibited high confidence in their knowledge of cookies while only 15.5% of those making claims could actually demonstrate some simple cookie knowledge. With higher perceived knowledge of Internet technology, experienced shoppers may be less concerned with the e-tailer's ability to monitor their online behaviors because their knowledge of the Internet technology is already incorporated in their expectations about their online activity (Miyazaki, 2008). In contrast, lower perceived knowledge of inexperienced Internet users may result in heightened attention to different signs or signals of information security.

The above discussion also implies that online shopping experience helps shoppers to develop a general knowledge structure of typical online privacy protocols. Theoretically, increased familiarity leads to better knowledge structures or "schema" that include evaluative criteria and rules used in assessing new information (Marks & Olson, 1981). In the context of privacy statements, more experienced online shoppers are likely to rely on their existing schema in evaluating new privacy statements and determining their adequacy. Consequently, more experienced online shoppers are likely to have greater confidence in their evaluations of a new privacy statement than less experienced online shoppers who lack any definite evaluative

criteria. Hence we hypothesize that online shopping experience will amplify the effect of consumer perceptions of the e-tailer privacy policy on their privacy concerns.

*H5: Consumers' online shopping experience has a negative influence on their privacy concerns.*

*H6: An interaction effect between privacy policy perceptions and online shopping experience magnifies the relationship between privacy policy perceptions and privacy concerns.*

## METHOD AND RESULTS

### Sample and Procedure

Survey respondents included undergraduate business students who received extra credit for their participation in this research. The student sample was deemed appropriate for this study because most online purchases are made by college-age consumers (Clemente, 1998) and other published studies have also used student subjects in testing theory-driven models of online behavior (Huang et al., 2004). A total of 280 students from six undergraduate marketing classes in southeastern United Stated completed the survey. However, after the missing data analysis the dataset was reduced to 271 respondents consisting of 133 males and 138 females. In terms of respondents' online shopping behaviors, they ranged from purchasing in multiple product categories (e.g., clothing, travel, electronics, etc.) and from multiple websites to limited product categories and one or two websites. The frequency of online shopping also varied, with most respondents (around 70 percent) making online purchases at least once a month.

The purchasing task in the survey involved online booking of air travel for an upcoming spring break. Online booking of air travel was chosen because of higher perceived privacy risk associated with this type of transaction (Bart et al., 2005). The survey participants received a questionnaire packet containing a print out of the homepage of a fictitious online booking agent, a copy of the agent's privacy policy, and the questionnaire. In the purchasing scenario, the fictitious booking agent was made to look like any other online travel agent (e.g., Expedia, Travelocity) to make sure that it was believable. It was described as a new website with great bargains on air travel. The booking process required customers to create an account where they had to respond to such personal questions as name and address, credit card information, and travel preferences (destinations, lodging, car rentals, and recreation). The scenario also referred survey participants to the agent's privacy policy, which was created to look very similar to the privacy policies of Expedia and Travelocity. Survey participants had ten minutes to review the materials in the questionnaire packet. Afterwards, the survey administrator collected the scenario materials leaving the respondents only with the questionnaire that they were required to complete in relation to their booking of air travel on the featured website. The questionnaire contained only the survey questions and did not require the participants to provide any personal

information – i.e., the task of creating an account was hypothetical and not a requirement. The purpose of this procedure was to ensure that the participants would respond to survey questions from memory instead of referring back to the materials in the packet. Also, using a fictitious online booking agent helped us to avoid the confounding effects of website-specific experience and allowed us to focus on general shopping experience as the study intended.

**Construct Measures**

Table 1 presents construct measures used in the study. We developed our measures by translating theoretical definitions of the constructs into their operational definitions and then subjecting them to several rounds of pretests using a different sample of student respondents. Our goal was to develop valid and reliable measures that would allow us to estimate a series of structural models to test our hypotheses. Therefore, each construct was analyzed using exploratory factor analysis (EFA) prior to its inclusion in a measurement model, where it was further purified following the confirmatory factor analysis procedure (CFA). This section provides a brief summary of EFA results and reliability estimates (Cronbach's alpha) of the measures. CFA results are reported in the results section.

E-tailer trustworthiness was measured with four seven-point Likert-type scales designed to assess respondents' perceptions of the booking agent's dependability, competence, integrity, and responsiveness to customer needs. The EFA produced a single-factor solution explaining 71.03 percent of variance. Cronbach's alpha of the scale was 0.92.

Privacy concerns measures were adapted from Smith et al. (2006) scale of privacy concerns with some changes in the wording to make them more context-specific. The original scale is comprised of four subscales – collection, errors, unauthorized secondary use, and improper access – that measure general consumer concerns with privacy online. For the purpose of our study, we created items that closely resemble the items in the collection and unauthorized secondary use subscales in Smith et al. instrument. Thus, in our study privacy concerns were measured with six items addressing both secondary use of information and shopping anonymity dimensions of information privacy (Goodwin, 1991; Hoffman et al., 1999). Specifically, respondents were asked to indicate their level of agreement with six statements measuring their confidence in certain e-tailer behaviors that are directly related to protecting shoppers' information privacy. These responses were then reverse-coded to get the measures of privacy concerns. Thus a strong agreement with a statement: "When booking air travel on this website, I feel confident that this online booking agent would not sell my personal information to other companies without my knowledge" translated into a low privacy concern score for this statement. The EFA single-factor solution explained 80.37 percent of variance. Cronbach's alpha of the scale was 0.95.

Respondents' perceptions of the agent's information privacy policy were measured with four seven-point Likert-type scales that asked to recall whether the agent's privacy policy was

available, clear, easy to understand, and could be considered credible. The EFA single-factor solution explained 70.63 percent of variance. Cronbach's alpha of the scale was 0.86.

To measure web-shopping experience, we asked respondents to indicate how long they had been shopping on the Internet, how often they made purchases on the Internet, and how they rated their knowledge of Internet shopping. These items were seven-point Likert-type scales. The EFA single-factor solution explained 76.48 percent of variance. Cronbach's alpha of the scale was 0.85.

| **Table 1. Construct Measures** |
|---|
| **E-tailer Trustworthiness** |
| When it comes to booking air travel on this website, I feel that this agent is:<br>1). Very Undependable (1)/Very Dependable (7)<br>2). Very Incompetent (1)/Very Competent (7)<br>3). Of Very Low Integrity (1) / Of Very High Integrity (7)<br>4). Very Unresponsive to Customer Needs (1)/Very Responsive to Customer Needs |
| **Information Privacy Concerns** |
| When it comes to booking air travel on this website, I feel confident that...<br>1). This online booking agent would not "spy" on me when I surf the Internet (Strongly Disagree/Strongly Agree).<br>2). This online booking agent would not sell my personal information to other companies without my knowledge (Strongly Disagree/Strongly Agree).<br>3). This online booking agent would not disclose my personal information to other parties without my permission (Strongly Disagree/Strongly Agree).<br>4). This online booking agent would not track my shopping habits or purchases on other websites without my knowledge (Strongly Disagree/Strongly Agree).<br>5). his online booking agent would request my permission before disclosing my personal information to other parties (Strongly Disagree/Strongly Agree).<br>6). This online booking agent would ask my permission before tracking my surfing behaviour on the Internet (Strongly Disagree/Strongly Agree). |
| **Privacy Policy** |
| This online booking agent's information privacy policy is... (Not Available/Available), (Difficult to Understand/Easy to Understand), (Confusing/Clear), (Not at all Credible/Very Credible). |
| **Online Shopping Experience** |
| 1). How long have you been shopping on the Internet? (Just Started/Have Been Shopping for a Very Long Time)<br>2). How often do you make purchases on the Internet? (Very Rarely/Very Frequently)<br>3). How would you rate your knowledge of Internet shopping? (Know Very Little/Know Everything About It) |

## Measurement Model

The proposed hypotheses were tested by estimating a series of models with covariance structure modeling, following a two-step approach (Anderson & Gerbing, 1988). Initially, a series of CFA models were estimated to ensure that all constructs had acceptable measurement properties. These models were consecutively estimated after being assessed in terms of fit, item

loadings, and modification indices. In addition to chi-square, model fit was evaluated with the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI or NNFI), and the root mean square error of approximation (RMSEA). Values of .90 and above for CFI and TLI and values of .80 and less for RMSEA have been typically used as indicators of acceptable model fit (Browne & Cudeck, 1993; Hu & Bentler, 1995).

Prior to model estimation, however, all construct measures were centered by having their raw scores replaced with deviation scores (i.e., deviation score = variable score – variable mean). This procedure reduces the inherent multicollinearity between the interacting variables (Ping, 2003). Then we created an interaction term of *privacy policy* and *online shopping experience* by following Kenny and Judd (1984) procedure. According to this technique, the interaction term is specified using indicators that are the unique cross products of the two constructs (also see Ping, 2006 for a detailed discussion of latent variable interaction techniques). All measurement models discussed here were estimated using centered construct measures and included the newly created interaction term with its product indicators.

The initial measurement model with 29 manifest indicators and five latent constructs had unacceptable fit ($\chi^2$ = 2054.16 (df = 367), CFI = .74, TLI = .71, and RMSEA = .12). After a careful examination of item loadings and modification indices, four indicators of the interaction term were dropped from the second estimation of the measurement model. The second model had a better yet still unacceptable fit and more items in the interaction term were dropped for their poor measurement properties. In sum, the measurement model was re-estimated three times, showing marked improvements in the model fit with each re-estimation. The final 21-item measurement model had a very good fit ($\chi^2$ = 391.81 (df = 179), CFI = .95, TLI = .94, and RMSEA = .065). The interaction term retained four items, which is acceptable considering that some established techniques for testing interactions with structural equation modeling use only a subset of Kenny and Judd's (1984) product indicators (Jaccard & Wan, 1995; Marsh et al., 2004). Table 2 reports CFA factor loadings and error variances of the retained individual items while Table 3 provides construct correlations, average variance extracted, and internal consistency estimates.

As shown in Table 3, Cronbach's alpha, the measure of internal consistency, ranged from .85 to .95. Discriminant validity was assessed by comparing the square of the correlation (phi-square) between two constructs and their average variance extracted (AVE) estimates (Fornell & Larcker, 1981). Discriminant validity is supported when phi-square is less than the average AVE. This is the most stringent test of discriminant validity and was met for all possible pairs of the constructs. In sum, overall results indicated a good fit for the measurement model.

**Table 2: CFA Factor Loadings and Error Variances (Final Measurement Model)**

| Items | Completely Standardized Loadings (error variances) | | | | |
|---|---|---|---|---|---|
| | PP | OSE | INTER | IPC | ET |
| PP1 | .68 (.53) | | | | |
| PP2 | .87(.24) | | | | |
| PP3 | .77 (.40) | | | | |
| PP4 | .78 (.39) | | | | |
| OSE1 | | .78 (.39) | | | |
| OSE2 | | .87 (.25) | | | |
| OSE3 | | .77 (.41) | | | |
| INTER1 | | | .93 (.13) | | |
| INTER2 | | | .67 (.55) | | |
| INTER3 | | | .76 (.42) | | |
| INTER4 | | | .83 (.31) | | |
| IPC1 | | | | .81 (.34) | |
| IPC2 | | | | .90 (.20) | |
| IPC3 | | | | .88 (.22) | |
| IPC4 | | | | .90 (.19) | |
| IPC5 | | | | .88 (.23) | |
| IPC6 | | | | .88 (.22) | |
| ET1 | | | | | .91 (.18) |
| ET2 | | | | | .91 (.17) |
| ET3 | | | | | .90 (.19) |
| ET4 | | | | | .90 (.19) |

Note: PP – Privacy Policy; OSE – Online Shopping Experience; INTER – PP x OSE interaction term; IPC – Information Privacy Concerns, ET – E-tailer Trustworthiness.

**Table 3: Correlations, Reliabilities and Average Variance Extracted Estimates**

| Constructs | Alpha | AVE | Correlations | | | | |
|---|---|---|---|---|---|---|---|
| | | | PP | OSE | PPxOSE | IPC | ET |
| Privacy Policy (PP) | .86 | .61 | 1.00 | __ | | | |
| Online Shopping Experience (OSE) | .85 | .65 | .18 | 1.00 | __ | | |
| Interaction Term (PP x OSE) | .88 | .65 | .07* | .02* | 1.00 | __ | |
| Information Privacy Concerns (IPC) | .95 | .77 | -.36 | -.28 | .10* | 1.00 | __ |
| E-tailer Trustworthiness (ET) | .95 | .82 | .51 | .26 | .02* | -.37 | 1.00 |

Note: * correlation is not significant at p = .05 level.

## Mediation Analysis

Testing for mediation using structural equation modeling required estimating three structural models in order to establish the existence of a relationship between the exogenous and the endogenous variables (H1) and to meet the three mediation criteria (Baron & Kenny, 1986; Judd & Kenny, 1981): 1) the exogenous variable must affect the possible mediating variable (H2); 2) the mediator variable must affect the endogenous variable (H3), and 3) if the first two conditions are met and the mediating variable is controlled for, the effect between the exogenous and the endogenous variables must be dramatically reduced or non-existent (Brown, 1997). That is, a reduced effect between *privacy policy* perceptions and *trustworthiness* when controlling for *privacy concerns* would provide evidence in support for partial mediation as specified in H4. The fit of each model, path estimates and variance extracted of endogenous variables (including the mediator) are discussed in the following sections.

### Model 1

The first structural model was estimated to determine the existence of relationships among *privacy policy* (exogenous variable), *trustworthiness* (endogenous variable) and *privacy concerns* (mediator). An additional path from *online shopping experience* to *privacy concerns* was estimated to test the hypothesis (H5) that posited a negative relationship between these two variables. All fit indices for this structural model indicated a good fit ($\chi^2$ = 214.37 (df = 115), CFI = .97, TLI = .97, and RMSEA = .057) and all paths were significant and in predicted direction. Thus *privacy policy* appeared to have a significant negative effect on *privacy concerns* ($\gamma_{11}$ = -.46, t = -4.9) and a significant positive effect on *trustworthiness* ($\gamma_{21}$ = .66, t = 7.49). In addition, *online shopping experience* had a significant negative effect on *privacy concerns* ($\gamma_{12}$ = -.20, t = -3.24), providing support to H5. This model explained 19 percent of variance in *privacy concerns* and 28 percent of variance in *trustworthiness*. In sum, the results of this structural model met the first mediation criterion and produced evidence supporting H1 and H2.

### Model 2

The main purpose of the second structural model was to establish a relationship between *privacy concerns* (mediator) and *trustworthiness* (endogenous variable), as prescribed by the second mediation criterion. The specification of this model was almost identical to Model 1, with the exception of two paths: the direct effect of *privacy policy* on *trustworthiness* was not estimated but an additional path from *privacy concerns* to *trustworthiness* was specified. The path from *online shopping experience* to *privacy concerns* was once again estimated to maintain the integrity of the mediation analysis. The fit indices of this structural model suggested a good fit ($\chi^2$ = 246.79 (df = 115), CFI = .96, TLI = .96, and RMSEA = .063). The effect of *privacy*

*concerns* on *trustworthiness* was significant and negative ($\beta_{21}$ = -.34, t = -5.97) thus meeting the second mediation criterion and providing support for H3. Similarly to Model 1, all other hypothesized effects were also significant and in predicted direction ($\gamma_{11}$ = -.44, t = -4.74; $\gamma_{12}$ = -.21, t = -3.40). This model explained 18 percent of variance in *privacy concerns* and 14 percent of variance in *trustworthiness*. However, judging by the difference in Chi-square, Model 1 fit the data better than Model 2.

**Model 3**

The last model was estimated to test for partial mediation by *privacy concerns* as stated in H4. In this model, all three effects were specified: 1) from *privacy policy* to *privacy concerns*, 2) from *privacy concerns* to *trustworthiness*, and 3) from *privacy policy* to *trustworthiness*. If partial mediation exists, the effect of *privacy policy* on *trustworthiness* established in Model 1 should become smaller. As before, the effect of *online shopping experience* on *privacy concerns* was estimated to maintain consistency. The fit of this model was very good: $\chi^2$ = 202.30 (df = 114), CFI = .98, TLI = .97, and RMSEA = .054. All path estimates were significant and in predicted direction ($\gamma_{21}$ = .54, t = 6.24; $\gamma_{11}$ = -.43, t = -4.64; $\gamma_{12}$ = -.20, t = -3.33; $\beta_{21}$ = -.19, t = -3.48). Also, as expected, controlling for *privacy concerns* reduced the effect of *privacy policy* on *trustworthiness*, although this reduction was not substantial (from .66 to .54). However, the Chi-square difference test suggests that the partial mediation model is a little more parsimonious than the direct effects model (i.e., Model 1): $\chi^2_{diff}$ = 12.07, $df_{diff}$ = 1. In sum, these results suggest that *privacy policy* has both direct and indirect effects on perceived e-tailer *trustworthiness* mediated by the customer's *privacy concerns*. In addition, the effect of *online shopping experience* on *privacy concerns* ($\beta_{21}$) was consistently significant and negative in all three models, which offers support to H5. The partial mediation model explained 18 percent of variance in *privacy concerns* and 30 percent in *trustworthiness.*

**Interaction Analysis**

The last hypothesis (H6) predicted a positive interaction between *privacy policy* and *online shopping experience*. To test for the interaction effect, we estimated a model where *privacy policy* x *online shopping experience* interaction term was specified as a predictor of *privacy concerns*. All other effects were the same as in Model 3 (partial mediation model). The fit of the interaction model was good ($\chi^2$ = 396.62 (df = 181), CFI = .95, TLI = .94, and RMSEA = .065) and, judging by the unstandardized path estimate, the effect of the *privacy policy* x *online shopping experience* interaction term was significant but small ($\gamma_{13}$ = .07, t = 2.14). Also, consistent with our hypothesis, the effect of the interaction term was positive suggesting that for more experienced online shoppers the e-tailer's information privacy policy is likely to have a stronger impact on their privacy concerns than for less experienced shoppers. This interaction

model explained 19 percent of variance in *privacy concerns* and 30 percent of variance in *trustworthiness*. We will discuss these findings, their implications, and future research opportunities in the following section.

## GENERAL DISCUSSION

### Discussion of Results

This study complements and extends existing literature on information privacy and online trust in several ways. First, we draw a clear distinction between trust and trustworthiness, noting their conceptual distinctions that are likely to have important implications for the interpretation of the empirical results involving these two constructs. Second, we show that consumers' privacy concerns partially mediate the effect of information privacy policy on e-tailer trustworthiness. Our findings suggest that information privacy may play a dual role in shaping customers' perceptions of e-tailer trustworthiness: 1) indirectly - by informing customers about the intended uses for their personal information and thus reducing their privacy concerns and 2) directly - by serving as a signal of the e-tailer's integrity and general concern for customers' well-being. In addition, we emphasize the importance of considering consumers' experience with online shopping when studying their privacy perceptions online. In our study, more experienced online shoppers demonstrated lower privacy concerns and their perceptions of the agent's privacy policy had a stronger impact on their privacy concerns than the perceptions of less experienced online shoppers. These findings corroborate Huang et al.'s (2004) study where experienced online shoppers demonstrated lower risk perceptions associated with online shopping than novice or even non-shoppers (i.e., browsers). Furthermore, they suggest that more experienced online shoppers are likely to react more strongly to e-tailers' information practices than less experienced online shoppers because of their better developed "schema" of acceptable information practices. The moderating effect of online shopping experience also implies that less experienced online shoppers require additional assurances about the safety of providing personal information to a particular website. With higher privacy concerns and limited online shopping experience, these novices are likely to place greater trust in third party seals than in the website's privacy policy. This supposition offers an interesting opportunity for follow up research.

In sum, our study highlights the important role of privacy statements in reducing shoppers' privacy concerns and helping online companies to communicate their trustworthiness. Despite the fact that some e-tailers do not post their privacy policies online (Tang et al., 2008) and some privacy policies are not easy to comprehend (Vail et al. 2008), our findings provide clear evidence that information privacy policies can effectively mitigate online shoppers' privacy concerns and enhance their perceptions of e-tailer trustworthiness. Information privacy policy is not only a signal of the website's integrity but also a form of social contract that promises

shoppers that their privacy will be protected. Therefore, it must occupy a prominent space on any website to make sure that customers are always aware of its existence.

**Future Research Avenues**

There are still many things we don't know about consumer attitudes toward their privacy online. For example, which factors influence the relative effectiveness of information privacy policies? Pan and Zinkhan (2006) found that online shoppers prefer short and more comprehensible privacy statements, but information privacy policy presentation format (in terms of wording) does not affect consumers' perceptions of e-tailer trustworthiness. Also, how much do consumers truly value their information privacy? What is the trade-off between consumers' desire for information privacy and their economic self-interest, including their desire for personalized market offerings? Some research suggests that consumers could be incentivized to provide their personal information (Ward et al., 2005). Another research avenue would be to investigate how information privacy breach of one website affects online shoppers' privacy concerns and their propensity to pay closer attention to privacy policies of individual websites. As Van Slyke et al. (2006) suggest, consumers' privacy concerns are general in nature and apply to the entire online market*space* as a whole. Hence, a single violation of consumer privacy (e.g., new Facebook features that jeopardize user privacy) could potentially plant a seed of skepticism and increase consumers' privacy concerns, making online shoppers less trusting of information privacy policies.

**Limitations**

Like any research, our study is not without limitations. One of these limitations involves our data collection method. The survey method cannot replicate the actual experience of booking air travel online. The interactivity of online shopping and the actual necessity to create an account and provide personal information will certainly elicit consumer thought processes that cannot be evoked with just a visual stimulus of an online booking agent and a scenario, regardless of how vivid and descriptive they may be. This may explain why our findings were relatively weak, although statistically significant.

Another limitation concerns our use of college students as survey respondents. Although students were appropriate for this study given their familiarity with online shopping and the nature of the task, our findings cannot be generalized beyond student population. Generally speaking, college students are likely to be better educated and more comfortable with information technology than their non-college educated counterparts.

Despite these limitations, however, our study makes a noteworthy contribution to published research on information privacy and online trust. Here we showed a process by which information privacy policy affects online shoppers' perceptions of e-tailer trustworthiness and

demonstrated the importance of considering online shoppers' experience in assessing the effectiveness of a website's information privacy policy.

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# A CROSS-CATEGORY BEVERAGE CHOICE MODEL: A NEED-BASED MULTI-ATTRIBUTE UTILITY APPROACH

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## ABSTRACT

*Given that a particular goal is salient, a consumer is likely to purchase in a category such that the category features most suitably serves to meet salient goal(s). Cross-category literature has not yet investigated a need-based approach in modeling consumer decision-making. This paper seeks to bridge this gap in the literature by proposing that consumers first choose a product category before making choice, quantity, and incidence decisions within a category based on their goals. Such an approach could explain different demand patterns of products (i.e., substitute, complement, and independent purchases) where goals are significant explanatory factors.*

## INTRODUCTION

Market basket choice models have been a major area of research in marketing. Such models are particularly insightful for manufacturers and retailers. Manufacturers can identify marketing-mix factors (e.g., packaging, price, or promotion) critical to a desired outcome (e.g., higher sales), and design effective cross-selling programs. At the same time, retailers can understand the sales of a product as a function of store display, or in-store promotions. Future sales due to change in product attributes, or marketing mix variables can also be predicted. In general, market choice models study consumer decision-making process (es) either within a product category, or across product categories.

Although brand choice, quantity, and incidence decisions within a category have been vastly studied, cross-categories choice models are still in the emerging stages. Within-brand choice models focus on a single category, and ignore any transaction(s) outside the category of interest. That is, these models, assume that purchases across categories are independent of each other. However, evidence suggests that consumer purchases are interdependent across categories (e.g., Chintagunta and Haldar 1998, Manchanda, Ansari and Gupta 1999, Kamakura and Russell 1997), and is part of any consumer purchase decision.

In real life, individuals do not simply make a brand choice, quantity and incidence decisions for a specific product category. Before making any one of these within category decisions, consumers generally make *a priori,* informed and rational decisions of purchasing

within that particular category, i.e., consumers may consider products that perform similar functions even though the products may lie in distinct categories (such categories are referred to as "substitutable" categories). Note that this decision-making process may be rational and automatic at the same time, thus requiring little or no effort on part of the consumer. Indeed, it is unlikely that consumers think about products in a discrete fashion. Consider the following example: A consumer may choose between purchasing a can of milk (a dairy product) or a can of juice (a fruit category product), since both juice and milk perform similar function (e.g., in terms of the nutritional input they provide). To an extent, these two products fulfill a similar function; one can assume that the two products provide the same utility to a consumer who is primarily looking for a product (liquid in form) that provides nutrition. In short, inter-category models can serve as a guide to understanding consumer decision-making at a more preliminary and basic level – before consumers' make brand, quantity, and time incidence decisions within a particular category – and therefore, seek to capture a richer and a more accurate process of consumer decision making.

Prior multi-product category models have focused on the impact of marketing mix variables, and utility derived thereof, in determining choice, incidence or quantity decisions across categories (See a brief literature review in the following section). This paper attempts to explore inter-category decisions with particular emphasis on consumers' goal(s) salient at the time of purchase. The model assumes that goals guide consumer purchases - whether within or across product categories. At the same time, this proposed model captures commonly considered independent variables in contemporary category models (viz., marketing mix, household and economic variables) as covariates. Most cross-category models (e.g., Manchanda, Ansari and Gupta, 1999, Ainslie et al. 2001, Chintagunta and Haldar, 1998) treat such variables as the primary drivers of consumer purchases.

In short, the proposed cross-category model underscore that consumers' purchase decisions, interdependent across categories, are driven by the ability of these products to meet consumers' salient need(s) to a more or less same extent. In modeling such behavior , it is proposed that the managers will be better equipped to understand how consumers evaluate and finalize purchase decisions across distinct categories.

## Related Literature

One of the earliest brand choice models were proposed by Guadagni and Little (e.g., Guadagni and Little, 1983). These authors developed a choice model for different brands of coffee as a function of marketing mix variables – price, promotion, and consumer specific variables (e.g., consumer brand loyalty). Similar models were soon developed keeping in trend the Guadagni and Little tradition. However, as the number of attributes that described a product increased, the model was found to be less mathematically manageable. Fader and Hardie (1996) suggested a novel technique of decomposing Stock-Keeping Units (SKUs) into attributes, and

defining these attributes as the unit of analysis. Although these models pioneered the choice modeling literature, modeling inter-category purchase decisions needed still more attention.

During this time, another fundamental form of studying across product categories was the study of cross-elasticities. Economists have long used this concept. For example, cross-price elasticity is the change in quantity of product *'a'*, when the price of the product 'b' changes. A positive value indicates that the two products '*a*' and '*b*' are substitutes, i.e., an increase in price (or due to changes in marketing-mix variables) of '*a*', reduces the consumption of product '*b'* (e.g., law of demand). Following the same argument, zero cross-price elasticity reflects that the two products are independent of each other. Although this concept is highly intriguing, it may not an appropriate representation of reality because of the *ceteris paribus (*i.e., all else remains constant) assumption. Similar to the concept of cross-price elasticity is the concept of change in change in quantity of '*b'* when there is a unit change in the advertising expenditure (or other marketing mix variables) of product '*a'*.

Quantitative within-category models in empirical marketing literature were focus in the 1990s, and most of these models have decomposed cross-category decisions in terms of quantity, choice and incidence decisions (e.g., Ainslie et al. 1997, Niraj et al. 2004, Seetharaman et al. 2004). Ainslie and Rossi (1998) provide evidence, using a hierarchical choice based model, that consumer sensitivity to marketing-mix variables (i.e., display, price and feature) is not unique to any specific category, but rather is common across categories. Hruschka (1991) demonstrated this integral role of marketing mix via a probabilistic logistic model. Another approach in research in choice, product, and incidence effects across categories relates to identifying demand interrelationships between brands or categories – substitutes, complements, or independence. For example, Niraj et al (2004) show in their quantity and incidence decision model, using a two-stage bivariate logit model that 20%-30% of the total cross-category effects of promotion(s) are due to quantity effects. Manchanda, Ansari and Gupta (1999) develop a multivariate probabilistic choice model using panel data to investigate households purchase incidence and demand relationships across multiple categories. In related vein, Russell and Peterson (2000) demonstrate using their choice-based model (multinomial distribution) that cross-categories price elasticities are rather small when the explanatory variables include marketing-mix as well as household specific variables.

Inter-category decisions are indeed integral to marketing literature. Feisbein (1967) proposed that the preference of consumer among multi-attribute alternatives is a function of consumers' preferences over attributes that describe the consumer alternatives. In other words, consumers' choice of product is not a manifestation of utility from the product but rather a utility from the bundle of product attributes that comprise it (e.g., Fader and Hardie 1996, Holt 1995). Goal-related literature posits that the salience of consumer goal at a point in time is a function of consumer's composite goal (or super-ordinate goal). Consumers make different choices among similar products (and categories) solely based on factors internal to the consumer (e.g., Lattin and Bucklin 1985, Lattin 1987), while maintaining a composite set of needs. Lattin and

McAllister (1985) proposed that consumers may have variety-seeking as a fundamental goal, and may therefore make purchase decisions on account of satiation on attributes products consumed previously In line of this argument, this current paper seeks to explain this internal consumer behavior by borrowing from behavioral theories related to salience of consumer goals. At the same time, this paper also seeks to understand demand relationships.

Every purchase is set to meet some component of consumers' composite need set salient in time. For example, the consumption constellation theory (e.g., e.g., NTC project) maintains that the symbolic ability of products that jointly allow consumers to express their lifestyle from an assortment/ array of categories (hence the term "constellation") is considered in making choice (e.g., NTC project). Consumers' purchase of a product can be considered as a 'revealed substitution' across similar (and substitutable) categories. (i.e., when consumer purchases a can of milk, instead of a can of juice, it can be said that the substitution of milk has been 'revealed' over juice). Some effort in incorporating behavioral literature in cross-category choice models has been made by Dhar and Simonson (1999) who investigated using experimental studies how consumers make contemporaneous choices across categories. These authors find evidence for trade-off between consumer goals and resources (e.g., budget) as consumers' try to balance attribute levels between the products.

Following the above trend, the model in this current paper proposes to investigate further, and provide greater insight into consumer decision making across categories, based on behavioral literature that consumer identifies his or her salient goal at a purchase occasion, by 'checking' back on the needs (goals) that have been satisfied in the past, and the components of the composite set that are yet to be satisfied. For example, if the consumer has been purchasing milk over the last few weeks (t-1), the consumer's goal of *need of vitamins* may have become satiated, while consumer's goal of *need for variety and flavor* has become more salient, assuming the consumer has *need of variety* and *need for nutrition* as the two components that define his or her composite need of *purchase of a liquid potable product*. Such a consumer is more likely to purchase juice or soda, rather than a can of milk.

In summary, the focus of this paper is to establish the role of salient consumer goals in determining purchases across categories. With this objective, a multinomial model that focuses on product attributes (and ability of these attributes in meeting consumer needs and goals) is developed. Unlike economic models, the *ceteris paribus* assumption does not restrict the model because the supply side changes are captured in via a *as-is* condition, and pattern of purchases observed are evaluated in terms of consumers' needs and goals.

## MODEL

The proposed model draws support from empirical and behavioral literature, and is discussed in this section.

**Multinomial Model**

The multinomial model (MNL) has been largely used in computing the probability of choosing an alternative as a function of the other attributes available. Despite the stochastic nature of the model (Guadagni and Little, 1983), the MNL has immense predictive powers and have been used in diverse contexts such as probability of purchasing an automobile from a particular dealer (e.g., Hlavac and Little, 1966), pre-test-market evaluation process Silk and Urban, 1978), or students' choice of business schools (e.g., Gench and Recker, 1979). One of the key assumptions of a logit (MNL) model is of the *Independence of Irrelevant Alternatives (IIA),* according to which the addition of a new product to the choice set, reduces the probability of already existing products in the portfolio to the same extent. In real life, this assumption is rarely maintained (e.g., Train, 1983). The model in this paper, assumes that the three product categories under consideration namely milk, soda and juice, are weak substitutes of one another, in that each is capable of satisfying consumers' *composite need for consumption of potable liquid* (or in meeting the super ordinate goal or the composite need set of a consumer), while still maintaining IIA assumption.

The composite (or super ordinate) consumer goal comprises a set of several smaller goals (e.g., MacAllister 1983). For example, when a consumer purchases a can of milk, the composite goal may be need for *of potable liquid,* however, other components of this super ordinate need may include - *need for proteins, need for vitamins, need for variety and flavoring*, *need to avoid harmful ingredients*. Note, that at any point in time, one or all of the component need set may be active (salient).

| | | |
|---|---|---|
| Composite or Super-ordinate *Need of potable liquid* | = | { *need for proteins, need for vitamins, need for variety/ flavoring*, *need to avoid harmful ingredient}* |

**Proposed Model**

The goal of this model is to understand the cross-category decisions by households, considering the ability of similar products (yet in distinct categories) to satisfy consumers' salient needs. This model posits, based on the concept of "weak-substitutability" (e.g., Callon 1991), that a consumer considers ability of similar product attributes, across categories, in satisfying salient needs at the time of purchase.

**Axiomatic View**

Consider an individual *'i'* whose goal or salient need at time 't' is to purchase a product that is liquid in structure, provides nutrition in form of protein/vitamin, and can be consumed daily (i.e., a component of the composite need). The consumer '*i*' is a specific household whose

information is captured via the UPC scanner data. The proposed model identifies a set 'S' or a consideration set that contains products across categories from which a consumer can choose. A consideration set is a collection of brands (or categories) that a consumer forms before considering purchase in any one of them (e.g., Robert and Lattin 1991, Siddarth, Bucklin, and Morrison 1995).

Using the definition of consideration set in context for this paper, one may define 'S' to contain a set of generic categories that is capable of meeting consumers' super ordinate needs, of which one or all may be salient at a point in time. For example, a need for a potable liquid can be represented as S = *{milk, juice, and soda}*. The set 'S' can include several other products (and product categories). However, for ease of exposition, this paper uses only 3 categories. It is assumed that the inclusion of more than 3 categories in the model will not change the validity of the results.

Given a consumer's salient need (i.e., active component of the super ordinate need set), the consumer can consider purchasing in two categories viz., purchasing a can of milk or a can of juice. Considering that a can of juice provides same nutrition, either in form of vitamins or proteins, the consumer may be indifferent between a can of milk and a can of juice. If, however, the consumer has an additional goal of purchasing a product that '*tastes fruity'* or has a preference of vitamins over proteins. (A can of juice provides more units of vitamins (and lower level of proteins), while a can of milk provides more units of proteins and lesser units of vitamins), the consumer is more likely to choose a can of juice over a can of milk. In each of the cases mentioned above, the consideration set will however be 'S' because the super ordinate goal of the consumer (i.e., need for a potable liquid) is constant under both circumstances. The attributes of a product in serving consumers' goals and needs are referred to as "*intrinsic features"* in this model. A can of juice provides more units of vitamins (and lower level of proteins), while a can of milk provides more units of proteins and lesser units of vitamins.

1. Say, the consumer chooses an alternative from the '$k^{th}$' product category from the set of available alternatives in the set 'S'. Then, using the random utility approach, it can be said that the

$$U^i{}_k = V^i{}_k + \varepsilon_k,$$

where

$V^i{}_k$ = deterministic component of utility consumer '*i'* derives from product category 'k',
$\varepsilon_k$ = random component of consumer '*i's'* utility that would vary from occasion to occasion and captures variables unobserved by the researcher. The error term, $\varepsilon_k$, for all alternatives in set 'S' are independently, distributed random variables with a double exponential Gumbel (type II extreme values).

The deterministic component of the utility is based on an additive utility model, where the utility that a consumer derives from the intrinsic features of a product in a particular category is considered. In line with Fader and Hardie (1997), this model considers intrinsic product attributes (across categories) capable of satisfying consumers' salient needs as independent unit of analysis. i.e., utility from product attribute represents its ability to satisfy a consumer need. For example, the deterministic component of utility from *intrinsic features* of product category milk can be expressed as follows:

$$V_{milk} = V_a + (-V_b) + V_c + V_d \qquad (1)$$

Where,

(a-d) refer to the intrinsic features that characterize the product category and are considered by the consumer in evaluating which of the *n* product categories in the set 'S' meet the consumers' goals salient at the time of purchase.
a= nutrition from vitamins,
b= disutility from non-healthy components such as sodium, high levels of fructose,
c= utility from fresh fruity taste
d= utility from different flavors

Following the above description, the utility derived from products in different categories (and belonging to the set 'S') can be identified based on the factors of the characteristics (or attributes) of the product. For example, $V_a$ would be high[1] (or '1') for milk, and juice but will be zero (or low) for soda. Similarly, disutility (i.e., $-V_b$) from consumption of sodium or sugar, or phosphoric acid (i.e, a unhealthy, yet key ingredient in carbonated drinks) will be high (or '1') for soda, but zero for juice and milk. Presence of the particular attribute in a product category will be represented by a dummy variable '1' to indicate presence, and '0' to represent its absence. Other two components of deterministic utility include marketing mix variables, such as, price, display, promotion (e.g., as in the Gudagni and Little model 1983), and external product attributes (e.g., Fader and Hardie 1996) such as product size, which are considered as covariates in this model.

Until now, the proposed model captures cross-category choice model by defining the set 'S' as a consideration set that a consumer 'rationally' takes into account while making a purchase decision based on his or her salient need. The proposed model does recognize that with an increased availability of brand variants within a product category, such as strawberry milk, the concept of 'substitutability' between product categories (i.e., milk and juice) may become even more compelling (e.g., strawberry flavored milk vs. strawberry juice). Indeed, the inclusion of a

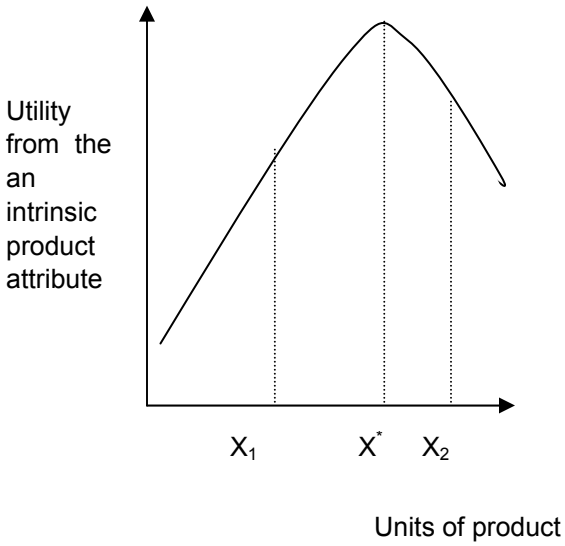
higher number of such variants will strengthen the case for substitutability among products categories (while still maintain the assumption of *IIA*).

2). Qualifying the utility function discussed under (1) further, the utility from the intrinsic features is captured in a non-linear (quadratic function).

For example, it is expected that the utility a consumer derives from a product attribute may reach a maximum and any further consumption of that attribute, and therefore consumption of the product is likely to provide disutility to the consumer. This expected disutility may discourage the consumer from purchasing the product (see figure 1, and equation (2)) below:

$$V_k = b_{ik} \sum V_{intrinsic} + c_{ik} (\sum V_{intrinsic})^2 + d_{ik} \sum M_{arketing\text{-}mix\ variables} + e_{ik} \sum P_{roduct\text{-}category\ external\ attributes\ variables} \quad (2)$$

**Figure 1: Utility Per Unit of Product Attribute Consumed**




The optimal units of consumption of the product is 'X*', and is based on the utility that the consumer derives from a particular product attribute. A consumer will continue to consume 'X' (i.e., at $X=X_1$, consumer will still consumer 'X' until X* units of X). Note, that at level $X_2$, consumer derives disutility on product consumption. 'b' (in equation 2) represents the coefficients for the deterministic component of utility are based on either goal satisfying attributes of the product, marketing mix variables (as in the Fader and Hardie model), and/or consumer specific variables. The total utility the consumer derives from the product determines whether the consumer purchases the product or not. Note, that at $X^2$ level of product

consumption (figure 1 above), β for the squared component (refer to equation above) will be negative. In short, deterministic utility for a product category 'k' is an additive (non-linear) sum of utility from intrinsic product category features, marketing mix variables, and consumer-specific variables.

3) Consumer heterogeneity is introduced in the model by considering factors that are unique to a particular household based on the UPC scanner data. For example, this proposed model incorporates variables for loyalty, and indicators for 'needs satisfied'. These variables will be different for consumers in different segments. Note that the marketing-mix variables will be constant for all consumers in a particular segment. The loyalty variables or attributes are calibrated (e.g., Guadagni and Little, 1987) based on consumers' prior purchases in the different segments. Loyalty is considered as an exponentially weighted variable weighted on the past purchases of the consumer. Consumer loyalty is calculated for every product (and brand for an extended model) in a every product category, and for every consumer who visits the store.

Using a latent class model (Kamakura and Russell, 1989), a finite number of homogeneous segments are assumed to exist such that the utility for a consumer '*i'* is determined on the basis of consumers' membership to a specific segment. In addition to loyalty, other household specific variables such as income, ethnic membership, or other demographic variables that are same for consumers' within a segment, but different across segments are considered. In the model below, addition takes place across homogeneous segments, where 's' represents different consumer segments.

4) Consumer 'i' would choose a product category over another depending on the utility of its attributes to satisfy the consumer's intrinsic need. Thus,

$$p_k = P\{u_k >= u_j, \forall\ j, k \in S) \qquad (4)$$

The probability of choosing in product category, 'k' over other alternate product categories for 's' consumer segments, can be written as:

$$P^{i|s}_k = e_{i|s}{}^{vk} / \sum e_{i|s}{}^{vj} \qquad (5)$$

If, however, a homogeneous population is considered then:

$$Pk = e^{vk} / \sum e^{vj}$$

The summation takes place ∀ j € S (e.g., Guadagni and Little 1987, Theil 1969), and $V_k$ represents the deterministic utility of all attributes of the product category 'k' (See equation 2 above).

In sum, revealed substitutability in purchase can be said to be evident when the probability of purchase of product 'k' has revealed its substitution over other product categories given that a particular goal is salient. Note, that the above represents a simple model, where in the consumption in a product category is not assumed to be time-dependent.

**Testing the Proposed Model**

Greater the number of attributes a product in a category (say, category 'k') shares across categories (other than category 'k'), the lower would be consumer probability of purchasing in both categories at the same time. This is because the product attributes required meeting consumers' salient needs would be met by one of the categories. In other words, the greater the number of unique characteristics of a product, not shared by other product categories, higher is the likelihood of purchase of that category. Therefore, whenever a purchase in a particular category is observed, it may be appropriate to assume that it is because the consumers' goal related to that unique attribute was salient at that time (This latter comment has not been tested).

*H1: A consumer is less likely to purchase product 'k' when the product 'j' purchased previously, shares with it a greater number of attributes.*

It is assumed that for products (say product 'A' and 'B') that share a greater number of attributes are likely to give approximately the same level of utility. In terms of the goal literature, it may be said that the since both the products serve the same or similar goal for the consumer, it is less likely that they are purchased at the same time. In testing the model, we expect that products with the same (same level) of partial coefficient 'b' (see equation 2 above) are less likely to be purchased at the same store visit.

Here consumer segmentation based on loyalty factors is likely to play an important role. For example, for consumers having the same set of composite needs, and segments of consumers that patronize the milk category may purchase juice less frequently than segments of consumers that patronize the soda category. Note that it is important to identify the consumers with the same set of needs in order to make this interpretation, because given the same set of needs (Say a certain level of nutritional need) one segment of consumers attempts to meet it via a large amount of milk and small amount of juice, while another segment attempts to meet it via a large amount of juice and small amount of milk. The above concept is similar to the balanced-choice behavior of consumers explained by Lattin (1987), in which he proposes using a logit model, that the past consumption influences the utility of items on subsequent choice occasions.

*H2a: When the consumer derives negative utility (i.e., disutility) from a product attribute , the consumer is less likely to purchase the product (category).*

Observing the sign of '*c*' (i.e., the coefficient of the squared consumption term) in equation 2 may help test for disutility from consumption of certain units of a product.

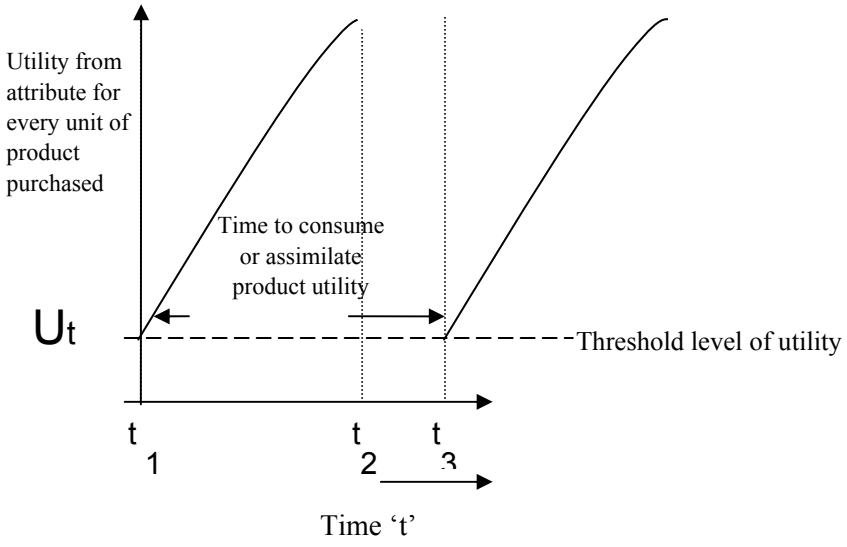
A reduction in product purchase is likely when one or more product attribute(s) provides disutility to a consumer (such as higher consumption of sodium or phosphoric acid for every can of coke purchased). At the same time, for some products such as milk, the utility derived from the vitamins may not reach a saturation level, as fast as the saturation level of sodium (or phosphoric acid) with increased consumption of soda, In other words, the disutility from increased consumption of vitamins (or other nutrients) from milk will attain maxima at a significantly higher volume level of milk when compared volume level of soda due to higher intake of sodium.

**Conceptualizing Inter-purchase Time**

The inter-purchase time for the purchase of the products can probably be defined in terms of the time taken for a consumer to consume (or assimilate) the utility from the product to the maximum . Once the utility from the product attributes reaches a certain lower threshold level or '$U_t$ '(like an inventory reorder level), consumer is more likely to the product that provides the utility (or a product from competing category that provides similar levels of utility ). That is, consumer is unlikely to purchase the product between $t_2$ and $t_3$.. Only when the utility reaches the lower threshold level (represented as '$t_3$' in figure 2) would the consumer consider purchasing the product. No product purchase takes place until utility falls (say due to non-consumption of the attribute) up the threshold level .. Future research can investigate the length of the inter-purchase time (say '$t_3$-$t_1$' in the graph below) and its association with the utility from product attributes across categories.

Lattin et al. (1980) proposed that the purchase across categories is similar to an inventory control system. Individuals have certain goals that need to be met at any point in time. For example, a consumer will look for products in different categories, each of which may have capability of meeting part or all of the composite need. For example, consumers have a need (or specified goals) of products that provide a specific level of nutrition, have a certain shelf life, provide a level of variety in consumption, and have ability to be used in consonance with other products. The choice of purchase in a particular category is determined by salience of consumer goal at a point in time.

**Figure 2: Inter-Purchase Time as a Function of Per Unit of Product Attribute Consumed**




6) Calibration and Estimation

The estimation is carried out at an individual household level. (See data section for more details). The first two-thirds of the data (or 78 weeks) is used for calibration of the model. The remaining one-thirds (or 36 weeks) of the data is used as a holdout sample. All households for whom the data is not available for the entire period under consideration (i.e., 104 weeks), are excluded from the data so as to avoid any systematic bias.

7) Sample likelihood function

$$LL = \sum^{n}_{h=1} \left[ \sum^{s}_{s=1} \prod^{S}_{k=1} P^{i|s}_{k} \right]$$

Sample likelihood function for the proposed model, is then used to estimate the parameters of the model by maximizing the log-likelihood function specified above. The function is summed for households represented by 'h' from '1' to 'n', and for the probability of consumer purchase for each consumer segment (i.e., from segment 's' =1 to segment 's' =*s*).

**Data Estimation and Testing**

This paper proposes to use UPC scanner panel data from a single store across three product categories namely milk, soda, and juice. The pattern of purchases of the consumer

(households) is observed over a period of two years – i.e. data from 104 weeks or two years is taken.

**Discussion of Expected Results**

I t is assumed that the quality of fit by including the intrinsic factors of utility would increase many folds.

| **Table 1: Expected Results** | | |
|---|---|---|
| | Prior Models | Proposed Model |
| **Marketing Mix Variables such as**<br>a) Promotion<br>b) Price<br>c) Display | Yes | Yes |
| **Product External Attributes**<br>a) Size of the product package | Yes | Yes |
| **Consumer Specific Variables**<br>a) Income<br>b) Product category loyalty | Yes | Yes |
| **Product Category Internal (or Intrinsic or need-based) Variables**<br>a) Nutritional value<br>b) Variety providing<br>c) Flexible usage<br>Shelf-life | No | Yes |
| $R^2$ | | Higher (and significant) |
| Log Likelihood (expected) | | Lower |

Note that the values for measures of quality fit, such as AIC, BIC, Log Likelihood and $R^2$ for prior models and the proposed model are highly judgmental and is based on norms observed from prior research. All the beta's for the proposed model are expected to be significant (with low standard errors), thus providing support for the proposed model. The table above represents an indicative level for quality-of-fit of model variables (*vs*. contemporary models viz. Guadagni and Little, Fader and Hardie).

## SUMMARY AND CONCLUSIONS

The proposed model is parsimonious and expected to be effective in predicting cross-category purchases. Under real life conditions, consumers do not demarcate or plan their purchase decisions as purchases in a certain category. Most of the purchases are made keeping satisfying some salient goal. For example, milk may be consumed for meeting the need for proteins (nutrition). The proposed model investigates cross-category choices for needs, *namely* need for a liquid potable product that (i) provides varying levels of nutrition (e.g., vitamins, sugars), (ii) meets consumers need for variety (e.g., variety available within the product category), (iii) is capable of being stored and (iv) can be offered to people on different occasions. Thus, the categories considered in the set are milk, soda and juice, and so chosen such that they meet the above-mentioned needs or goals to varying degrees. Such a model can be extended to evaluate /model consumer category decisions in the solid food categories. For example, consumers decide purchasing between products in a meat category and the fresh vegetable category. Each of the two categories provides varying levels of nutrition as well as variety.

Learning about the pattern of cross category purchases among related product categories could serve as a guide to retail managers in planning timing and extent of promotions, level of in store displays and other marketing mix variables. Manufacturers may utilize this information in designing /planning the content of their advertising. For example, since long advertisements have focused on the unique selling proposition (or the USP) of a product.

Some of the limitations of the proposed model are identified as follows: First, this need-based cross-category choice approach explores the role of only choice in determining the relation among the cross-category purchases. That is, it captures only the main effects of product category choice, and ignores interaction effects such as enhanced utility from purchase of both milk and juice (e.g., Niraj et al. 2004). For example, it is possible that the utility consumer derives from the consumption of juice and milk one after the other, may provide the consumer a higher utility than the individual consumption of the products. It has, however, been observed that main effects as opposed to interaction effects account for a large portion of variability. It is customary to observe only direct effects, rather than interaction effects in marketing and economics (e.g., Fader and Hardie 1996). At the same time, however, investigating interaction effects can also add interesting insights for manufacturers planning promotions such as ‘buy one product, get any of equal or lower value half-off. This research question has been reserved for future investigation. Second, the model captures information from a single store only. Real life circumstances indicate the consumers do not generally depend on a single store for all of their purchases. Third, the proposed model does not identify separate product purchases in a particular product category, i.e., it does not look into choice among brands (e.g., national versus private labels) but treats the categories as homogeneous among themselves.

## ENDNOTE

[1] A similar model based on effect coding can be identified (e.g., '-1' for high level, '1' for medium level, '0' absence) of the product attribute in meeting consumer goals. The proposed model is based on a dummy coding structure, however, using effect coding to capture the three levels (i.e., high, medium, and absence) will not change the proposed model.

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