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Chief Editor:

Ahmad Tootoonchi
Department of Management
Frostburg State University
101 Braddock Road
Frostburg, Maryland 21502
Tel: 301-687-4740
Email: Tootoonchi@frostburg.edu

Editor:

Kathleen O'Connor
Quality Editing
P.O. Box 344
Thurmont, MD 21788
Tel: 301-524-4973
Email: katheoc@earthlink.net

Managing Editor:

Robert A. Page
School of Business
Southern Connecticut State University
New Haven, CT 06515
Tel: 203-392-6139
Pager1@southernct.edu

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Editorial Note

I am proud to present the second issue of *International Journal of Business Disciplines* featuring a collection of outstanding papers that were presented at the 2006 International Academy of Business Disciplines (IABD) conference. All papers submitted to the IABD go through rigorous blind review process before being accepted for presentation at its annual conference. A group of high quality papers from the 2006 IABD conference were selected and sent through a second round of blind review, and in the end, a team of outstanding editorial board members, guest editors, and external reviewers recommended eight of them for publication in this issue.

To accomplish this, I have received tremendous help and support from a wonderful group of individuals and organizations. I am deeply grateful to the President of Frostburg State University, Jonathan Gibraltar; Dean of FSU *Business* at Frostburg State University, Danny Arnold; Executive VP of IABD, Abbass Alkhafaji; Board of Directors of IABD; and my distinguished colleagues who served on *JIBD* Editorial Board.

I am also thankful to Kathleen O'Connor, editor; Louis Falk, web coordinator; Reza Eftekharzadeh, treasurer; and Robert Page managing editor for their outstanding contribution towards completion of this task.

The Editorial Board members and I hope you enjoy reading the second issue of *JIBD*, and consider it our contribution towards a better understanding of business and human-related issues in today's complex global environment.

Ahmad Tootoonchi, Chief Editor
Journal of International Business Disciplines

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A MENTAL MODEL TO CAPTURE eCOMMERCE ATMOSPHERICS

Hy Sockel, DIKW Management Group
hy@dikw-mgt-grp.com

Louis K. Falk, University of Texas at Brownsville
louis.falk@utb.edu

Homer Warren, Youngstown State University
hbwarren@ysu.edu

Kuanchin Chen, Western Michigan University
kc.chen@wmich.edu

ABSTRACT

Retailers spend a great amount of effort and resources focusing their activities on attracting consumers, building relationships, and enticing people to make purchases. In the physical world, the importance of store environments to retailers' success is unsurpassed. The field of study that addresses the store environment and its impact is known as atmospherics.

Atmospherics within a physical store is expensive to manipulate. It is also literally impossible to match a store's environment to the taste of every consumer. This is not the case with e-tailing (selling over the Internet). Electronic store (eStore) environments influence shopping behavior through mediating emotional states. Factors such as Web site organization, product data, and search options have been found to influence shopping behavior. This paper argues that heuristic decision modeling for the online environmental elements needs to have greater attention. To that end, this paper explores how the ideas of retail atmospherics may be applied to eCommerce Web site designs and offers the Cyberspace Atmospherics Mental Model (Camm) as a method to facilitate design decisions.

INTRODUCTION

Retailers spend a great deal of time, effort, and resources on attracting consumers, building relationships, and enticing people to make purchases (Babin & Dardin, 1996). Most retailers are not capable of flourishing on just a single sale. Retailers are always looking at anything that will improve the consumers' experience. In this regard, the store's layout (lighting, ambiance, and associated environments) has long been recognized as important tools in creating a shopping atmosphere. The field of study that addresses the store environment and its impact on retail sales is known as atmospherics. Kotler (1973-4, p. 50) defines atmospherics as "the conscious designing of space to create certain effects in buyers that enhance the purchase probabilities." Store atmosphere impacts emotional reactions, which in turn affects consumers' attitudes towards the store. Store atmospherics are sensory or environmental cues used to influence a consumer's evaluation of the retail surroundings to elicit a behavioral response (Hedrick, Oppewal, & Beverland, 2004). Atmospherics have been shown to have an effect on consumer

spending, enjoyment, engagement, amount of time they stay within the store, and the likelihood of returning” (Donovan & Rossiter, 1982).

Atmospherics in the physical store is very inflexible and expensive to manipulate. This is not true with e-tailing. The Internet permits businesses to present products in a way that are deemed interesting to individual viewers based on a set of stored individual user’s preferences. These preferences can be stored on the user’s machine (via cookies) or on the retailer’s servers. The retailers can give the users authority to adjust their preference, or it can be done automatically, unknown to the user based on his/her behavior. Things that can be tracked and used to determine a user’s profile include: what sites are visited, which terms are searched for, and what pages have been visited though intelligent techniques.

Analogous to brick-and-mortar retailing, in e-tailing, factors like Web site organization, server performance, product data, search options, and shopping carts have all been found to influence shopping behavior (Falk, Sockel, & Chen, 2003; Turban, Lee, King, & Chung, 1999). Atmospheric effects include increased “visit” time (Lacher & Mizerski, 1994; Yalch & Spangenberg, 1990), mood (Swinyard, 1993), and increased purchase intentions (Babin & Attaway, 2000; McGoldrick & Pieros, 1998). Bitner (1992) proposed that consumers view the store environment as a composite of three dimensions: ambience, space/function and signs, symbols and artifacts (Hedrick, 2004). Maintaining a consumer friendly shopping site is essential to the success of Internet retailers. Therefore, it is important to understand the variables that contribute to satisfaction among Internet consumers (McKinney, 2004).

Research has shown that a store’s environmental attributes has an effect on its “stickiness”— the ability of the store to attract, entice, and encourage customers to purchase products initially as well as repeatedly (Sharma & Stafford, 2000; Fiore, Yah & Yoh, 2000). Korgaonkar and Wolin (1999) found that a correlation exists between the amount of time (quantity and frequency) a consumer visits a store and the consumer’s exposure to the retailers’ products, services, and messages. Korgaonkar et al. also found that the amount of time users spent online to be positively correlated to individuals’ intention to shop online. Intentions are important. They are an indicators of a consumers’ willingness to 1) stay in the store, 2) repurchase, 3) purchase more in the future, and 4) recommend the store to others (Baker et al., 2002; Hightower, Brady, & Baker, 2002; Macintosh & Lockshin, 1997. According to Sanchez (2001) “stickiness = relationships = loyalty = revenues.”

The effect of a store’s environmental attributes on visitors’ behavior may be explained through the flow theory. “Flow” as defined in this theory is the holistic sensation that people feel when a person acts with total involvement; in other words, the point when everything comes together (Csikszentmihalyi, 1977, 1988). The characteristic of being in a “flow state” includes a high level of focus on the interaction, a loss of self-awareness, absorption in the immediate task, and intense interest in the activity (Chen, Wigand, & Nilan, 2000). The “flow state” is pleasurable and causes individuals to feel they are fully in control (Bennett, 2005, p. 135).

RELATED LITERATURE

The present state of research concerning store environments draws its underpinnings from environmental psychology; specifically; the Stimulus-Organismic-Response (S-O-R) framework (Eroglu, Machleit, & Davis, 2003). Donovan and Rossiter (1982) first empirically tested the S-O-R framework. According to this framework atmospheric elements are operationalized as

“stimuli,” individual (or shoppers’) emotional changes as “organism,” and the resulting behaviors as the “response.” This paradigm has been used to explain numerous environmental cues (e.g., color, lighting, music, and fragrance) and the related effects on buyers’ internal states and responses. Eroglu, Machleit, and Davis (2001, 2003) “laid the conceptual foundations for the extension of the S-O-R paradigm to e-tailing. Their research provided empirical support for the effects of cyber atmospherics on shopper attitudes, satisfaction, and a variety of approach/avoidance behaviors” (Sautter, Hyman, & Lukojus, 2004, p.14).

A variety of metrics have been used to try to capture the effect of atmospherics on consumers with the de facto standard being “P-A-D” - Pleasure, Arousal, and Dominance (Mehrabian and Russell, 1974). The P-A-D framework specifies individual reactions toward environmental stimuli on three dimensions. In the literature, these three dimensions are commonly used to represent the “organism” aspect of the S-O-R framework, with atmospheric stimuli used to measure various kinds of responses (e.g., satisfaction, reactions and actual behaviors). P-A-D “responses determine the desire to remain within or leave a setting and the willingness to spend money while there” (Bennett, 2005, p. 133).

The Pleasure aspect entails whether individuals perceive the environment as enjoyable or not enjoyable. The Arousal dimension assesses how much the environment stimulates the individual. Playing slow instrumental music, for example, may result in slower customer movement and might attribute to a decrease in arousal. The Dominance element relates to whether individuals feel dominant (in control) or submissive (under control) in the environment. Mehrabian and Russell (1974, p.19) indicate dominance is contextual and that “an individual’s feeling of dominance in a situation is based on the extent to which he feels unrestricted or free to act in a variety of ways.”

Empirical evidence shows that the pleasure and arousal dimensions are related to the consumer reactions toward environment stimuli in both retail and non-retail environments, but the effect of the dominance dimension is unclear (Russell, 1980; Yalch & Spangenberg, 2000). For example, Donovan and Rossiter found that shopping behaviors were related to the pleasure and arousal dimensions only, while, Yalch and Spangenberg found mixed results concerning the relationship of shopping time and the three dimensions. Consequently, the dominance is either considered a minor factor or is simply not measured (Russell, 1980).

Online store environments contain various stimuli that may influence a consumer’s internal (or organism) state, which can then trigger the approach or avoidance response (Mehrabian & Russell, 1974). For example, store music, colors, odor (scent), lighting, and density of merchandise among various variables can all be varied to project specific images for the intended clientele. The major challenge is to determine exactly what materials are going to be shown, what they are going to be associated with, and how much of the Web page will they monopolize. A vast amount of information could be relevant to the user (consumers) but delivering superfluous information can impede consumers from making good decisions (Bettman, Johnson, & Payne, 1991). The sections below are designed to identify major categories of features that are most likely to affect online atmospherics. Although each of the sub-section below can be a separate article by itself, our goal here is to pinpoint the importance of these categories in relation to atmospherics.

User Interfaces

In virtual store environments, the user interface design is essentially the only thing linking the consumers to the retail store. The “interface” impacts the consumers’ desire and willingness to shop as well as relates a sense of being in the store to the customers. The more comfortable and connected the customers feel the more willing they are to be involved. As such, the success of the store depends on the interface and the underlying design issues (Lohse & Spiller, 1998). This means that retailer needs to pay attention to “consumer desires and behavior” picking a target population to aim for will not guarantee success. It has become extremely important for the virtual retailer to collect customer (viewer) information in order to incorporate their needs, wishes, and preferences in the design and development phase of the virtual store environment (Vrechopoulos, et. al, 2000).

Satisfaction

Ho and Wu (1999) were among the first to empirically study e-satisfaction. They suggested several antecedents of customer satisfaction in the online shopping environment: including logistical support, technological characteristics, information characteristics, homepage presentation, and product characteristics. Szymanski and Hise’s (2000) study of e-satisfaction found that convenience, site design, and financial security were dominant factors in determining consumer satisfaction (McKinney, 2004).

The Senses

The use of environmental attributes available for Web designers are severely limited compared to the traditional physical store. Elements that include a sense of smell, taste, and touch are not yet commercially viable. Typically, the online environmental attributes that can be manipulated are sight and sound. Most atmospheric elements that are second nature in a traditional physical environment cannot be used on the web. While three-dimensional objects can be simulated, this often means trading resources such as (download) time or screen “real estate.” Another technique that seems to work well in the physical environment – product density (how close together items are located) does not necessarily translate well onto the web.

Personalization

Personalization, or the ability to give individualized attention, is often cited as an important driver of satisfaction in traditional service settings (Bitner, Booms, & Tetreault, 1990; Brown & Swartz, 1989). Suprenant and Solomon (1987) offer complex definitions of personalization that “refer to any behaviors occurring in the interaction intended to contribute to the individuation of the customer”(p. 87). Studies on personalization have focused on customization of Web site content and shopper communications (Coner, 2003).

Customers want to feel special; they do not want to be just a name or a number. They want personalization in their business interactions. In this regards, the success of new marketing campaigns, sales promotions, and customer support initiatives must focus on the customer rather than the product. In the long run, success hinges on an organization understanding its customers (Firstlogic, p.1). “Technology enabled,” customers can easily be offered “full-capability” in the creation of a shopping environment based on their own preferences and wishes (Vrechopoulos et al., 2000). E-Customers have very low costs associated with a website, simply enter a new URL

address, and they are on a competitor's Web site (Turban, 2006). Given these disadvantages and the current competitive realities, the store (and Web site) environments clearly play a significant role in the differentiation of individual retailers.

Mandated Features

Certain features have become mandates within the cyber environment, such as the following:

(1) *Signage*: Physical stores need to be concerned with things such as: restaurants, restrooms, elevators, product location, exits, etc. Signage for these features is very important. In the virtual store it could be argued that symbols are more important than that of the physical store, because shoppers do not have physical cues or access to store clerks or for help. Signage has been expanded in a virtual store to promote navigation, to enhance site credibility, and sponsor integrity/reputation. Additionally, graphic brand marks from certification and rating services; such as eTrust, Verisign and BizRate, are used to indicate their stamp of approval on certified sites. Credibility can also be derived from design elements such as affiliate linkages (Putcha, 2001).

(2) *Ambient conditions*: These are the “background conditions that exist below the level of immediate awareness” (Aubert-Gamet, 1997, p.29). They typically are a focus of research on reactions to sensory cues in physical stores. In this vein, studies of ambient conditions focus on visual cues (e.g., lighting and color), auditory cues (e.g., music and noise), olfactory cues (e.g., scents), and tactual cues (e.g., temperature) (Griffitt, 1970). For virtual settings, the range of ambient conditions is limited to visual and auditory stimuli because of current technology constraints. However, auditory stimuli in e-tailing because of bandwidth concerns should be cautioned. See a more elaborated discussion on music and time below.

(3) *Cyber-interactivity*: This is becoming a strategic tool to improve the quality of Web sites for attracting users and keeping them engaged at a site. Sautter, (2004, p. 16) presents interactivity as a design characteristic of virtual store environments. Interactivity is seldom considered a one-dimensional construct. One popular conceptualization is to view it in the following five dimensions proposed by Ha and James (1998): playfulness, connectedness, reciprocal communication, choice, and information collection. Chen and Yen (2004) reported in their empirical study that the playfulness, connectedness, and reciprocal communication dimensions (in increasing order of significance) were related to the quality of commercial websites.

(4) *Usability*: In the online context, ease of use has also been a primary component of usability (Swaminathan et al., 1999) or efficiency (Zeithaml et al., 2000). Usability for cyberspace concerns not only the usefulness of certain offerings (i.e., Web site content), but also the user interface that delivers such offerings. Shoppers want sites that are valuable and easy to use. Features that aid the users can help retain visitors' interests. Although interface usability is crucial for an e-tailing site to foster a pleasant online experience, caution should be exercised when overly relying on it as the sole factor to boost online sales. Since interface usability can be easily imitated, its long-term competitive edge is less salient compared to factors, such as customer confidence in the Web business and relationship services (Kotha, Rajgopal, & Venkatachalam, 2004).

(5) *Navigation*: “In e-tailing, factors like Web site organization, server performance, product data, search options, and shopping carts all contribute to a positive Web shopping experience.

Easy navigation on a Web site for a consumer who wishes to buy through the net is a major facilitating factor.” (Sivakumar, 2003). Similar to usability, navigation is a basic requirement for a functional and well-designed e-tailing site. To some (e.g., Elliott and Speck, 2005), it is part of the usability construct that fosters ease of use and gives e-retailers a strategic tool to lower consumers’ search cost. Despite the crucial role of navigation in the quality of e-tailing sites, research has been inconclusive on its effect on sales. Ranganathan and Grandon (2002) reported that navigation structure had no significant impact on online sales, but others (such as Swaminathan, Lepkowska-White & Rao, 2003) have supported such a relationship.

(6) *Searchability*: Friendly search options add to the convenience of the consumer. The search feature is used in two ways: 1) finding the site through major search engines, and 2) locating information within a site. The design of the site and how many resources are invested in the site does not matter if users cannot find the site. High placement of a site within a search engine results can be critical to the success of the organization, since most users do not have the patience to go beyond the first several pages of the search results. Chen and Sockel (2001) reported that high placement on major search engines may be influenced by playfulness and reciprocal communication features on Web sites. These features increase link referrals (backward links), which is one factor that carries weight in the placement results of modern search engines, such as Google and Lycos. The other aspect of “searchability” is functionality within a Web site. This capability is considered equally important, because if products cannot be located on a Web site, customers will go to another site.

(7) *Trust*: Early electronic commerce research (e.g., Neuman, 1996; Strader & Shaw, 1997; and Shaw, Gardner & Thomas, 1997) documented that security is a major concern for most users who attempt online shopping. Online buyers are likely to lose faith in Internet security when they do not have an opportunity to examine the products, the transaction processes, and the credibility of the sellers (Chen, 1999). Trust in Internet commerce as a whole (George, 2002) and trust in target vendors (Elliott & Speck, 2005) have both been confirmed as related to a consumer’s attitude toward online purchases.

(8) *Response time*: system response time is inversely related to computer user satisfaction (i.e., the longer the wait, the greater the dissatisfaction). Industry standard suggests that a Web site should load completely within 8 seconds (Falk, 2000).

(9) *Time, Music and Shopping*: Time is an important factor in retail shopping, partially because studies have shown a significant correlation between time spent shopping and the amount purchased (Isen, 1989). Also, time is argued to be as much a constraint on consumption as money. Consequently, it is reasonable to expect individuals to budget their time, including shopping times. In the end, it boils down to “People simply don’t enjoy waiting.”

Music in the brick-and-mortar stores is often manipulated as an environment stimulus to affect shopping time and product evaluation. The nature of music - foreground music or background music has a differential effect based on the age of the shoppers. Music also affects actual shopping times. Individuals tend to stay longer when listening to slow music compared to no music or fast music (Milliman, 1982). The loudness of the music and song length may also make a difference. Yalch and Spangenberg (2000) reported found a relationship between store music and time spent in the store; individuals might shop longer when listening to less familiar music. Music, however, did not have an effect on product evaluation when duration of shopping was not controlled. When subjects were listening to familiar music but were constrained by a fixed

amount of time to shop, they were more likely to evaluate products. In a similar line of research, Sullivan (2002) reported that spending in a restaurant was not related to tempo and popularity of the music, but it was positively related to softer music. The amount of time and money spent in supermarkets were related to shoppers' degree of preference in the background music, but tempo and volume of the music did not have such an effect (Duncan, 1996). Based on the above studies, the collective effect of music on user behaviors may be mixed. Perhaps individual characteristics of music (such as liking of music, volume, and genre), rather than music in a collective way, may have a more salient effect on certain user behaviors. This effect may not necessarily be in the form of immediate sales, but may be linked to a better user experience, such as satisfaction or product exploration.

In the online e-tailing environment, background music may have a very different effect on user behavior. First, background music increases bandwidth consumption. This will slow page loads and can hamper user experience, especially on low-end Internet connections (e.g., dial-up connections). Second, background music exposes a shopper's online activity to his current environment, which could possibly cause embarrassment or distractions for others within the same environment. Unlike shoppers in physical stores, online shoppers visit e-tailing sites at their convenience. Third, some music characteristics are outside of the e-retailers' control. For example, the volume of music is typically in the hands of online shoppers and the music quality could be affected or even distorted depending on the quality of speakers on the shopper's end. Fourth, empirical findings (e.g., Abdinnour-Helm et al., 2005) suggest that background music on e-tailing sites is considered annoying and could result in low user satisfaction and lower ease of use perception. For the above reasons, e-retailers are recommended not to use background music, unless it is the target of interest for consumers.

CAMM - A CYBERSPACE ATMOSPHERICS MENTAL MODEL

Presented to this point in this paper, though not exhaustive, has been a list of items important to the development of the e-tailing environment. The forms of mandated cyber atmospherics for e-tailing and elements attracting the users (consumers) were detailed. In an attempt to both capture the e-tailing design elements and provide a usable tool for e-tailers, a cyberspace atmospherics mental model (CAMM) is proposed. Seel (2001, p. 408) characterizes mental models as cognitive artifacts – inventions of the mind that represent, organize and restructure the subject's domain-specific knowledge in such a way that even complex phenomena (observable or imagined) in the world become plausible. Greca and Moreira (2002) offer a working definition:

“A mental model is an internal representation which acts as a structural analogue of situations or processes. Its role is to account for the individual's reasoning when s/he tries to understand discourse, tries to explain the discourse, or tries to predict the physical world behavior.”

As a mental model CAMM is constructed around four well-recognized marketing ideas:

1. The targeted Web site consumers (as identified by demographic characteristics)
2. The consumer's value set
3. The design (or atmospheric) elements of the Web site
4. Mass customization – personalization & culturalization

Note: CAMM is meant to dynamically create a Web site to match a specific user's profile. In this regard, it should be thought of more like a “Portal” as oppose to a static Web page.

CAMM and Demographic Characteristics of the Targeted Consumers

While a horde of constraints exist for e-tailing, internet based online sites have a power that most physical environments do not, that is, they can tailor the presentation to a particular user. This ability to customize the Web site concurrently for different consumers via all the various elements discussed such as: the forms of cyber atmospherics, e-tailing atmospherics, and mandated features for cyber environments, (what will hereinafter be referred to as cyberspace atmospherics) enhances the organization's ability to attract and retain the users.

Classic marketing concepts indicate that an organization should try to satisfy the needs of its customers through a coordinated set of activities because it is the consumers' perception that counts. The customer's level of satisfaction is at the very core of the classic "marketing concept." These concepts are fully compatible and applicable to e-tailing and Web site design. Early adopters of e-tailing tried to replicate the "brick and mortar" methodologies into the cyber world. Major concerns were that most of the sites were rigid in nature and did not take advantage of the power of the Internet. In short, the cyberspace atmospherics elements need to give the targeted customer a pleasurable experience. Organizations that were unfamiliar with the new approach did not know how to adequately use the data that was generated. CAMM combats this issue by forcing the "e-tailing architect(s)" to consider the market's demographic characteristics before making cyberspace atmospherics decisions; CAMM uses the following Figure 1:

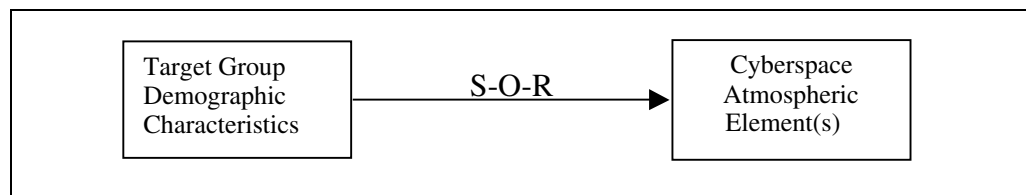


FIGURE 1. CLASSIC APPROACH

The classical approach (Figure 1) gives the impression that the market is homogeneous. This can lead architects to view the market monolithically in terms of segment demographic characteristics. This can cause one to mistakenly believe that nearly everyone in the target group experiences the Stimuli (S), such as pictures, navigation, background colors, or music, in the same way and therefore have the same orgasmic (O) pleasure, arousal, and dominance reactions; producing similar approach or avoidance responses (R).

Marketing generally builds upon some form of segmentation to establish target markets. Lazer and Wyckham (1969) indicate that one general method of direct interest to retail management is to separate consumers into groups—those that are based upon "demographic characteristics such as age, sex and life cycle stage; and those that distinguish market segments on the basis of consumer perception, perception of self, perception of products, perception of values, and perception of stores." To capture the fact that demographic characteristics possess personality and other psychological-social factors that in turn have an influence on attention to, comprehension of, and emotional reaction to the cyberspace atmospheric elements, CAMM incorporates values into its operational process. While consensus is yet to be reached in terms of how to measure values, there appears to be a generally accepted definition of "values." Howard and Woodside (1984, p. 4) defined values in two parts enduring beliefs that

- 1) a specific mode of conduct is personally or socially preferable and
- 2) a specific end-stage of existence is personally or socially preferable.

In the same study, Howard and Woodside examined the different roles that values play in terms of extensive problem solving, limited problem solving, and routine response behavior and found that “values affect a buyer’s recognition of a problem. Values are the broad functions common to all personalities. A value is either consciously or unconsciously a standard or criterion for guiding behavior,” (p. 4). They concluded that, “different consumers form different choice criteria according to their value systems” (p. 5).

Similarly, Pitts and Woodside (1984) found that the consumers’ values held promise as useful market segmentation variables. Specifically in the context of retailing, a few research projects (Allen, 2001; Erdem et al., 1999; Kim et al., 2002; Shim & Eastlick, 1998) have examined the relationship between values and attitudes and behaviors pertaining to consumers’ choices of product classes, brands, store outlets, and shopping malls. Figure 2 depicts how CAMM values may be viewed as mediated by both the consumer and retail issues.

To avoid semantic issues CAMM uses the classic organizational behavior acronym “VANE” (Values, Attitudes, Needs and Expectation) to distinguish “psychological values” from scalars, indexes, and derived values. There is no fixed set of “VANE” (characteristic values); CAMM permits the architect to determine what characteristics are considered important. CAMM uses a scale with extremes from Low Applicability (LA) to Highly Applicable (HA). CAMM does not set any rules for defining the meaning of a value or how the architect determines the applicability of a value to the market. While CAMM does not depend on a particular set of VANE items, a set of 69 items is suggested (see Table 1). These values are compiled from Rokeach’s (1973) terminal and instrumental personal values and Hawkins, Best, and Coney’s (2001) self-oriented, environmental-oriented, and other-oriented values. CAMM provides the designer with an ordinal continuum to select values that may be deemed to best represent the market.

TABLE 1. ATMOSPHERIC MATRIX 69 VALUES

Comfortable life	Exciting life	World of peace	Equality
World of beauty	Family security	Freedom	Happiness
Inner harmony	Mature love	National security	Pleasure
Salvation	Self-respect	Wisdom	True friendship
Social recognition	Ambitious	Broad-minded	Capable
Cheerful	Clean	Courageous	Forgiving
Helpful	Honest	Imaginative	Independent
Logical	Loving	Obedient	Fatalistic
Polite	Responsible	Self-control	Individual
Collective	Adult	Romantic	Child
Masculine	Feminine	Competitive	Cooperative
Youth	Hero worship	Work to live	Performance
Status	Tradition	Change	Risk taking
Safety	Problem solving	Nature loving	Active
Passive	Materialistic	Leisure	Hard work
Technology	Information	Abstinence	Humor
Serious	Immediate gratification	Sensual gratification	Sense of accomplishment

Note: The sixty-nine values were compiled from various literature on values (e.g., Rokeach, 1973; Hawkins, Best, and Coney's, (2001) list of other-oriented, environment-oriented, and self-oriented values).

Figure 2 demonstrates how the consumer and retailer appraise the VANE ("value set") using a semantic differential scale. In this particular instance, 1 means the construct has Low Applicability (LA) and 7 means Highly Applicable (HA). An elegant aspect of this approach is that both the retailer and the target market have a set of characteristics accompanied by a particular VANE that will operate in assessing cyberspace atmospheric elements. Research relating demographics and values support this scheme. As an example, a study by Crosby, Gill, and Lee confirmed earlier findings that, "there are age group differences in values," (1984, p. 209). They concluded that, "cohort-historical, maturational, or some other age-related influence on values is present," (1984, p. 214).

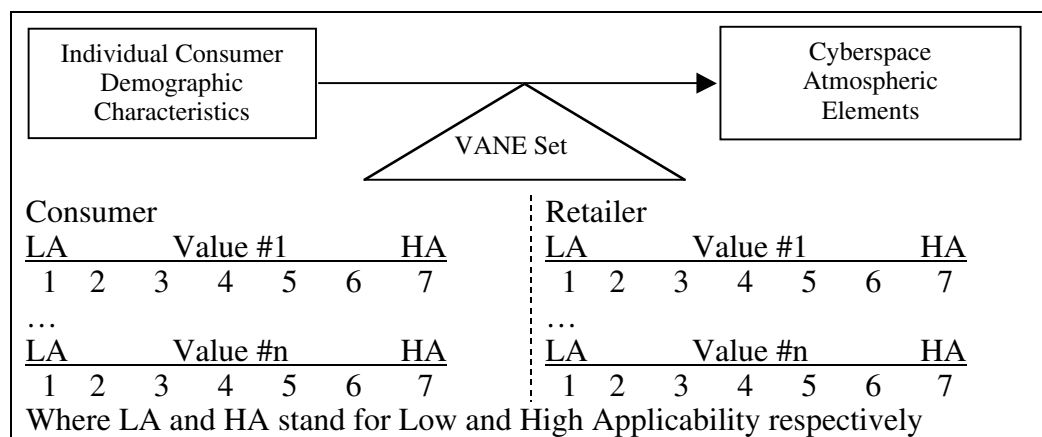


FIGURE 2. APPROACH MEDIATED BY THE VALUE SET

Because CAMM is implemented programmatically, "target groups" can be as small as one person, this would be very work intensive and problematic if the architect had to manually enter, validate, maintain, and monitor all activity for what could be hundreds, thousands or millions of customers. Instead, the person(s) (known as the "e-tailing architect(s) or just architect") responsible for management of CAMM are defining the processes that will be implemented within CAMM's Life Cycle. The architect is responsible for directing the Web site designers and developers; coordinating implementation and execution issues, evaluation of the systems, and the establishment of "default profiles."

The architect establishes two sets of values. The first set of values represents an organizational weight for each of the VANE atmospheric elements. This weight is meant to represent how important the organization views this specific element. The second set of values represents a default profile specification for consumers until they established their own "VANE" profile. When the user requests a Web page, the system automatically checks to see whether an internal profile setting exists for this site. If one does, the server uses the profile. If one does not, then the server uses a default profile and creates an initial user profile. The default profile values are not critical, as part of normal operations, CAMM adjusts the values for each specific user, based on the specific user's behavior. Thus, over time the default profile will eventually converge towards the user's values that operate during the interface. This approach of mapping personal profiles with CAMM based preference value set can be referred to as "active preference matching," in

which user personal preferences and atmospheric preferences are not only stored, but also updated based on two main sources: user's willful setting of the preferences, and "learned" user preferences from active capturing of user online behavior. Therefore, the stored user preferences are not static values. They change as the user continues to navigate/use the Web site.

Our approach of "active preference matching" through the CAMM model employs both the induction and deduction processes, as opposed to the many popular data mining techniques which primarily rely on an induction technique (e.g., market basket analysis). Our induction process allows the Web architect to pull out the data set of user profiles and preferences. Through this wealth of data values, patterns of initial user preferences could be formed or "mined." This initial set of user preferences may be used for new users to start their journey on the Web site, or for existing users who wish to "reset" their own preferences with the site. The deduction process begins during the user's visit on the site where their navigation patterns are analyzed and deduced. Potential benefits (in the form of ads, promotions, and other offerings/content) may be presented along with the intended content.

Consumer Value's Reaction to a Cyberspace Atmospheric Decision

CAMM argues that the consumer's VANE is instrumental in causing the consumer to respond in a favorable or unfavorable way to the cyberspace atmospheric elements. This is in line with value-attitude-behavior hierarchy which proposes that within any given consumption choice situation, abstract values affect midrange attitudes that lead to specific consumer behaviors (Homer & Kahle, 1988). Relating marketing decisions to values is also in line with Reynolds and Gutman's (1984) means-ends chain research: "...a means-ends chain is a model that seeks to explain how products or services are linked to ends, which are a person's values," (p. 156). Furthermore, the means-end chain, "offers a view of how values guide behavior by formulating a model of how values, which are very general in nature, relate to consumer choice, which is very specific" (p. 156).

In the physical environment, because of the low volume of consumers (comparably to the Internet) and the limited nature of the inquiry, manual monitoring and tweaking the store's atmospherics might not be possible. The cost of adjustment in the physical world could limit how often and to what degree the layouts, walls, and stock may be manipulated. On the Internet, intelligent application of artificial intelligence (AI) software allows for mass customization with each user receiving a layout that can match his/her own preference. The intricacies of AI allow for large numbers of users to have their preference determined and saved in knowledge nuggets. These nuggets are used as part of a "gate-keeping" activity that either directs a user to pre-existing pages or dynamically creates Web pages that are in tune with the user's cognitive behavior. CAMM explicitly acknowledges that atmospheric decisions are not independent of each other. However, some tool needs to exist to determine the type of customer the organization is dealing with and to aid in the application of traditional CRM (Customer Relationship Management) tools. The construct of perceived value and goodness of fit is introduced below.

Perceived Value

From the above, Equation 1 is developed. Equation 1 is the CAMM decision tool that facilitates the architect in determining final cyberspace atmospheric elements(s) to be employed. The perceived value gives the architect a tool to analyze and monitor CAMM's performance. In this

regard, CAMM can be used not only to dynamically create Web pages, but also to evaluate a static site to get better response.

PV = a specific consumer's overall perceived value towards the specific set of cyberspace atmospheric elements

a = represents the ath consumer

i = represents the ith atmospheric element

$$PV[a] = \sum_{i=1}^n OW[i] * IS[i]$$

IS[i] = Individual Satisfaction factor of the ith atmospheric element

OW[i] = The Organizational Weight or importance of the ith atmospheric element

n = Number of atmospheric elements important to the decision process

EQUATION 1. PERCEIVED VALUE FORMULA

Equation 1 states that the overall perceived value held by a specific user for a specific set of atmospheric elements is the algebraic sum of two components multiplied together: the Weight (importance) the organization puts on an attribute, and the Satisfaction (also importance) level that the viewer places on the same atmospheric element.

An Example

To aid in the understanding of CAMM Perceived Values, an example is provided. For convenience only, the first seven characteristic elements from the 69 values are illustrated. The values are listed in Table 2 and repeated in Table 3. Two sets of values are determined by the Architect: 1) the weight—representing the importance the organization puts on the characteristic item, and 2) a default user profile (for new users). Eventually, the user's preference values can be ascertained by asking the consumer directly in exchange for some promotion or by watching his/her behavior.

Based on the scale given, the minimum preference value is 1 and the maximum is 7. Given the total number of atmospheric elements selected (n) there will be an upper limit of n * 7 and a lower limit n * 1 between which the perceived value (PV) will fall. Table 2 shows an example of how organizational weights and individual satisfaction values are assigned to each atmospheric element.

TABLE 2. AN EXAMPLE – ATMOSPHERIC MATRIX ELEMENT

Matrix item	Org. weight	Individual Satisfaction Values	Implied Meaning	
Comfortable life	6	6	HA	Important
World of beauty	3	5	HA	Somewhat important
Inner harmony	5	4	A	Neutral
Salvation	1	3	A	Somewhat unimportant
Social recognition	5	2	LA	Not important
Cheerful	3	1	LA	Of no value
Helpful	7	7	HA	Very important

The individual's perceived value (PV) matrix items scores are calculated by multiplying the Organizational Weight by the Individual Satisfaction (profile) value. This will yield a value between 1 (an organizational weight of 1 multiplied by a satisfaction value of 1) and 49 (an organizational weight of 7 multiplied by a satisfaction value of 7). The results for all multiplications are summed to give the overall perceived value (PV) for a specific consumer.

TABLE 3. EXAMPLE – MAXIMUM PERCEIVED VALUE

Matrix item	Org. weight	Individual Satisfaction Values	Org weight * Max Value	OW *IS (PV)	% of max (7*7 =49)		OW _i -IS _i ABS Val
1. Comfortable life	6	6	42 = 6 * 7	36	36 / 49	73%	0
2. World of beauty	3	5	21 = 3 * 7	15	21 / 49	43%	2
3. Inner harmony	5	4	35 = 5 * 7	20	20 / 49	41%	1
4. Salvation	1	3	7 = 1 * 7	3	3 / 49	6%	2
5. Social Recognition	5	2	35 = 5 * 7	10	10 / 49	20%	3
6. Cheerful	3	1	21 = 3 * 7	3	3 / 49	6%	2
7. Helpful	7	7	49 = 7 * 7	49	49 / 49	100%	0
			MPV = 210	PV = 136	136 / 343	39%	
(MPV - PV) / MPV							

From the organizational perspective, the organization weight value is multiplied by the maximum possible score (seven); see column 4 in Table 3. These individual matrix products are summed to form the Maximum Perceived Value (MPV). The MPV in our case is 210. The Total individual PV is calculated in a similar fashion (in this case 136) and subtracted from the MVP. The difference (in this case 74) is divided by the MPV to determine a percentage of acceptance or rejection. The problem with this approach is that the individual contribution of each item is diluted. A single indicator does not offer an architect insight on how and where to improve the ecommerce site. Therefore, the value needs to be refined. An individual item value can be calculated by subtracting the individual's satisfaction level (IS) of the item from its Organizational weight (OW). The last column in Table 3 shows such values in absolute terms. The items that have the lowest absolute difference or a value of zero indicate that the organization and the user both agree on the value of the item. The items with the highest absolute value of six indicate maximum disagreement between the organization and the user.

The General Decision Rule

The use of the CAMM model suggests that a general decision rule should be adhered to. The authors recommend that any cyberspace atmospheric element(s) that has at least 75% agreement between the organization and the individual should be accepted for modification. Any element that has below a 75% agreement should be left alone (rejected). Obviously, the 75% is arbitrary and can be adjusted according to a company's wishes or needs. An added value of this model is that with use the architect can now easily see that some items actually have negative impact. Elements that produce negative dispositions should be carefully examined, as they represent the perception differences between the organization and its users. It is important to remember that the actual calculations are being done in real time and individual PV's are hidden from the view

of individual users. Because this is an online operation, calculations for a highly successful site could be done at a rate of dozens, if not hundreds of times within a minute. The calculations only become visible when the architect is monitoring the gate-keeping functionality of CAMM.

DISCUSSION

Online merchants are anxious to improve the return of their Web site investments. Therefore, they need to learn their visitors' actions as they occur. Each year, an organization may make hundreds of marketing decisions based on cyberspace atmospherics. The outcome of these decisions most often flows directly to the bottom line. One example is when a consumer is mistakenly directed to a site. In the industry, this is referred to as bounce. The term "bounce" is what happens when the site is attracting the wrong audience or failing to deliver to the consumer items/information s/he is looking for. Bounce happens when a visitor comes to the site and then leaves without looking at any other pages. Perhaps worse for the retailer is when the consumer goes through the effort to select a product and abandons it in the shopping cart (Ruber, 2003). If the users do not feel welcome or involved in the site, they will leave. Rarely, will they explain why. According to Jupiter Research, 66% of consumers reported having abandoned a purchase while on a website. E-tailers must take a proactive role to protect their investment. In a study reported by Computer World (2006), Jupiter Research indicated that over 70% of retailers do not analyze their data.

CAMM was introduced to facilitate holistic assessment and to be used as a decision making tool concerning cyberspace atmospheric elements within Web site designs. CAMM employs a discovery approach when contemplating the processes and elements in Web site design. Users of Web sites do not experience each separate atmospheric element in isolation, but as part of the whole experience. However, the literature indicates decision-makers tend to consider one atmospheric element in isolation of other elements; even though consumers respond to the interrelationships between and among atmospheric elements (an interrelationship that has synergistic dimensions).

CAMM affords the Web site architect the opportunity to make cyberspace atmospheric decisions within the context of the sensory (seeing and hearing the elements), cognitive (the gate-keeping activity of the each value relative to the element(s)), and affective (overall feelings towards the element(s)) components of the consumer. The results from the CAMM model are often for the entire webpage or even the whole Web site not just the individual elements that compose the combination. Therefore, CAMM could be used to explore various interactions between and among selected cyberspace atmospheric elements.

The operational aspect provided by the CAMM allows the organization greater insight into how values can be used to select specific cyberspace atmospheric elements. Using the overall scheme of the CAMM model should allow it to be employed as a worksheet for cyberspace atmospheric decisions.

Large corporations or small operations can use the CAMM. Although it has a simple mathematical construct (PV), a small operation can ignore measuring the values (using the 1 to 7 scale) and the degree of disposition a value feels towards an atmospheric element(s). CAMM is just as effective as a decision making tool when it encourages a small operation to intuitively determine the consumer's values and intuitively judges the reactions that the values may have towards the contemplated Web site design.

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**WHEN RETAILERS HAVE YOU BY THE NOSE:
THE INFLUENCE OF ENVIRONMENTAL FRAGRANCING
ON PATRON EVALUATIONS, PERCEPTIONS, & INTENTIONS**

John E. (Jack) Gault, West Chester University of Pennsylvania
Jgault@wcupa.edu

ABSTRACT

Casino operators have long known that the longer players gamble, the larger the house's take. Similarly, extending the amount of time other retail patrons shop may increase their opportunity for spending. Atmospheric research suggests that manipulating ambient scent may influence the length of time customers remain on the premises. Moreover, since scent knows no language barriers, the global implications of harnessing the power of environmental fragrancing are enormous. Consistently predicting the direction and magnitude of scent-induced effects, has however, proved quite difficult. Employing scent for strategic advantage is therefore deemed somewhat risky. This study aims to reduce the risk by increasing our understanding of how, and under what circumstances environmentally induced feeling states may lead to increased shopping time and other desired outcomes. A laboratory experiment tested affective state induction under situations of low and high involvement, and the transfer of these feeling states to the enjoyment of, and willingness to remain in, an environmental setting. Results indicate involvement and scent pleasantness matter most. Theoretical and managerial implications are discussed.

INTRODUCTION

Environmental Influences on Behavior

The idea that people respond emotionally to their immediate surroundings is widely accepted in psychology (Machleit & Eroglu, 2000). The environments in which consumers shop, eat, and play, may therefore arouse emotions and moods, and these induced feelings can, in turn, influence consumer attitudes and behaviors (Barnes and Ward 1995; Gardner 1985). Although retailers have at least implicitly understood these relationships for decades, there has been little scientific research into the effects of store environments on shopper emotions (Bagozzi et. al., 1999), attitudes and/or behaviors (Turley & Milliman, 2000). Improving our understanding of retail atmospherics offers two immediate benefits for global retail marketers. First, since store choice often precedes brand choice (Darden, 1983), improving our ability to manipulate the store environment offers a potentially powerful marketing tool to differentiate a retailer from its competitors (Kotler, 1973). Second, since many purchase decisions are made within the store (Keller, 1987), retail atmospherics offers a potent influence on point-of-purchase consumptive behavior. Yet, despite these implications for influencing consumer decisions, many marketers continue to rely mainly on traditional research paradigms, which focus on verbally processed stimuli, ignoring the many non-verbal aspects (Holbrook & Hirschman, 1982). Additional scientific research of non-verbal sensorial cues is needed, as these stimuli have been shown to play an important role in the induction of feelings, which in turn may be linked to buyer attitude, preference, and behavior (Belizzi & Hite, 1992). One non-verbal element of the environment of particular interest for studies of consumptive behavior is scent. While scent has long been regarded

as a very powerful and enduring sense, attempting to harness its power has been rather elusive. A general lack of understanding of the underlying dimensions of scent has impeded our ability to predict behavioral and other induced effects at point-of-purchase. A multidisciplinary approach, which includes not only retail atmospherics, but also research from environmental psychology and olfactory science, offers fresh insights on eliciting desired scent induced outcomes.

Olfactory Influences on Behavior

Physiologically, our sense of smell is directly connected to the brain's limbic system, the center of all of our emotions (Serby & Chobor, 1992). Our olfactory sense has therefore often been described as our most emotional sense (Benderly, 1988). Marketing investigations of olfactory effects on consumption have primarily involved scent in two forms—scented objects and ambient scent (Gulas, 1994). Marketers have conducted a few studies of ambient scent effects, either related or unrelated to the products being sold (Miller, 1993). Recent investigations of scent effects on retail shopping behavior have found significant relationships between induced affective states and perceptions of the store and its product content (e.g., Spangenberg et al., 1996, Mattila & Wirtz, 2001), time spent in the store (Kellaris & Kent, 1992), and propensity to make a decision, and satisfaction with the shopping experience (e.g., Dawson et al., 1990; Sherman et al., 1997). There have, however, been inconsistencies in demonstrating scent effects. For example, Spangenberg et al., (1996) found only one of three product evaluations was significantly affected by ambient scent. Yalch and Spangenberg (2000) suggested that with few exceptions, (e.g., Hui & Bateson, 1991; Dube et al., 1995) a possible cause is that few experimental studies investigate the underlying emotional states of pleasure, arousal, and dominance. Donovan and Rossiter (1982) postulated these “PAD” variables as factors mediating the effect of store environment on shopping behavior. The current study will address these inconsistencies and gap in the extant literature.

Purpose of the Research

To help remedy omitted or conflicting empirical observations in the existing literature, an interdisciplinary framework is developed to enhance our understanding of atmospherics. As Machleit and Eroglu (2000) suggest, there are three models from environmental psychology, which hold interest for marketers interested in assessing induced emotional response. These models include: Izard's (1977) ten fundamental emotions, Plutchik's (1980) eight basic emotion categories, and Mehrabian and Russell's (1974) Pleasure, Arousal, and Dominance (“PAD”) dimensions of emotional response. The Mehrabian and Russell PAD scale is regarded as preeminent in the field of environmental psychology (Machleit & Eroglu, 2000). There have however been a few recent challenges to the M-R model's pre-eminence. For example, Machleit and Eroglu (2000) found the Plutchik measure explained more variance in shopping than the PAD scale, although Havlena and Holbrook (1986) found the reverse to be the case when assessing consumptive behavior. In a test of competing models, Chebat and Michon (2003) found Lazarus's (1991) Cognitive Theory of Emotions better described their outcome than Mehrabian and Russell's PAD variables. They further concluded that rather than experiencing a mood shift, shoppers simply transferred the pleasantness/unpleasantness of the scent to the object. The Chebat-Michon study incorporated the (same) citrus scent used by Spangenberg et al. (1996)—a commercially available “combination of orange, lemon and grape” (Chebat & Michon 2003, p. 534). They found that while that scent was arousing, it provided little induction of pleasure or mood (Chebat & Michon 2003, p. 534) and supported their hypothesis (H1a) that a “light and pleasant scent arouses consumer” (Chebat-Michon, 2003, p. 533). The current study demonstrates that not all light and pleasant scents are created equal, and that while one will induce arousal, another is just as likely to

induce a relaxed state. As Warrenburg (1999) suggests, an improved taxonomy to describe scents is needed. The taxonomy might include a scent’s underlying hedonic (pleasant), activation (arousal), and mood dimensions. The current study pre-tested various pure (unblended) scents, known among olfactory experts to induce affective states that were either pleasant and arousing, or pleasant and relaxing, or unpleasant and arousing. To demonstrate the link between a scent’s underlying dimensions and its resultant induced affective state, the current study extends earlier atmospheric theory (e.g., Kotler, 1973; Bitner, 1992; Gulas & Bloch, 1995). Specifically this study tests an expanded version of the basic M-R Stimulus-Organism-Response (S-O-R) model (Figure I) by incorporating both situational moderators and interactive effects (Figure II).

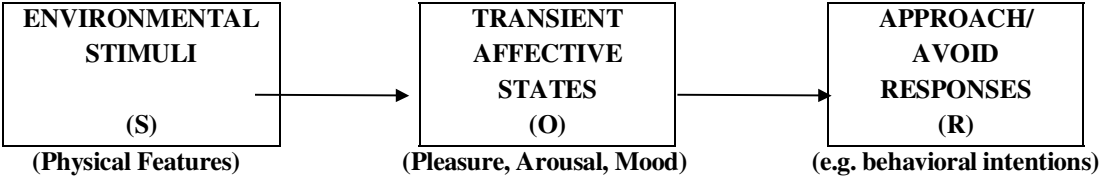


FIGURE I. THE BASIC S-O-R MODEL

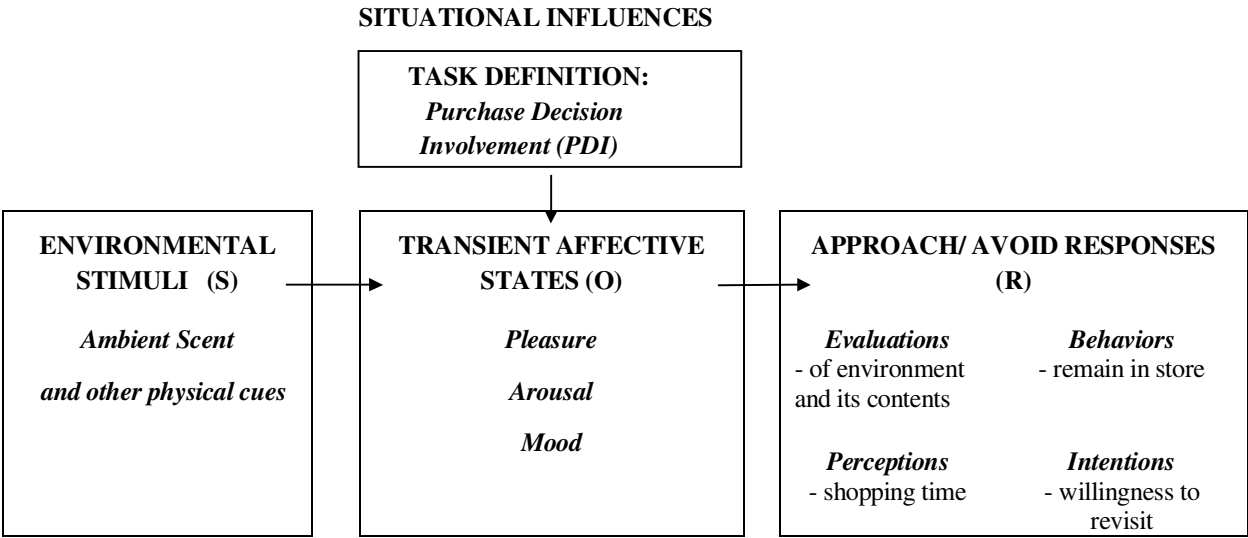


FIGURE II. PROPOSED MODEL OF SITUATIONAL INFLUENCES ON RETAIL SHOPPER RESPONSES

In the basic M-R model, environmental stimuli (S) induce affective states (O), which in turn mediate approach-avoidance responses (R). The M-R model offers a theoretically sound foundation for developing our understanding the effects of ambient scent and other environmental influences on consumer behavior. Earlier atmospheric researchers have also adapted this M-R mediational framework of affective transfer to retail settings (e.g., Russell & Pratt, 1980, Donovan & Rossiter, 1982, 1994; Spangenberg, 1996). Russell and Pratt (1980) adapted the M-R framework by operationalizing stimuli (S) as physical features of the retail environment, and willingness to buy as the approach-avoidance response (R). Environmentally induced affective states have been found to influence consumer evaluations including assessments of the environment and objects in the store (e.g., products, sales people). However, inconsistencies in the findings suggest the need

for additional theory development (Spangenberg, 1996). For example, Spangenberg et al. (1996) found that positive affective state induction utilizing pleasant scents resulted in increased levels of positive evaluations of a backpack, but not of a calendar. Spangenberg theorized that the impact of scent on specific product evaluations might have been moderated by attitude toward the product (1996, p. 75). He suggests that the backpack evaluations improved because it was a less-liked product to begin with, versus the calendar, which was much more highly evaluated in the unscented condition. Similarly, Spangenberg found that purchase intentions improved significantly for the backpack in the pleasantly scented condition, but not so for the calendar. He suggested that purchase intentions might not improve significantly for products to which consumers are already favorably disposed (1996, p. 76). Finally, Spangenberg suggested that the inclusion of offensive (negative) scents would provide an interesting comparison, as his study included only affectively pleasant and affectively neutral scents. He also found no difference in store evaluations under either of these two conditions.

As shown in Figure II, and as the olfactory science literature suggests (e.g., Cain, 1978, 1982, 1988; Doty, 1981, 1985, 1991), a scent's hedonic (pleasure-displeasure) quality and activating (arousal-sleepy) dimensions should be assessed for their separate and interactive influences on affective transfer. As a result, the current study examines the manner and degree to which an ambient scent's hedonic and activation dimensions influence shoppers' approach-avoidance responses. The study also includes the interaction of affective transfer and mood. As mood research (Gardner, 1984, 1985; Gardner & Siomkos, 1985; Ger, 1986) indicates that mood may play an important role in modeling affective transfer. According to Bone and Ellen (1999), mood effects are likely to parallel the hedonicity of the odor (i.e., pleasant odors leading to pleasant mood states, and unpleasant odors leading to unpleasant moods). Approach-avoidance responses in the proposed model are therefore operationalized to include positive-negative evaluations of the environment, and perceptions of time spent in the environment.

As suggested by Spangenberg (1996), and unique to the current study is the incorporation of a negative (unpleasant) scent. As he and other atmospheric researchers indicate, it is important to understand consumer reactions to negative as well as positive affective dimensions (Babin & Attaway, 2000). Additionally, the current model incorporates situational influences. Research on attitude change and persuasion (Petty & Cacioppo, 1986) and on involvement in attitude change (Petty, Cacioppo, & Schuman, 1983) and on situational research (Belk, 1974, 1975, 1984) suggests that situational influences may moderate the relationship between environmental stimuli and consumer responses. Belk's (1974, 1975) environmental situational factors are included as potential moderators of the effects of ambient scent on shopper responses. Belk's five situational factor categories include (1) *physical surroundings* (e.g., physical environmental stimuli), (2) *antecedent states* (e.g., transient affective states), (3) *task definition* (e.g., purchase decision involvement), (4) *temporal perspective* (i.e., time dimension), and (5) *social surroundings* (e.g., other people present). The proposed model incorporates and tests the first four of Belk's situational variables and includes environmental stimuli, transient affective states, and purchase decision involvement (PDI) as independent variables. Perceived shopping time is also among the dependent responses tested. The current study also controls for the situational influence of social surroundings (Belk's fifth variable), and for other non-situational influences such as gender and age. In summary, the proposed expanded model aims to refine our understanding of the effects of the physical dimensions of ambient scent by decomposing scent into its underlying activation and hedonic dimensions, and by incorporating situational influence as a key moderator of affective transfer. Several hypotheses are tested within this model.

HYPOTHESES

The Moderating Influence of Involvement

The influence of induced affective states (pleasure, arousal and mood) on shopper responses (evaluations, perceptions and intentions) is thought to be moderated by situational factors such as purchase decision involvement. The Elaboration Likelihood (ELM) Model (Petty & Cacioppo, 1986; Petty, Cacioppo & Schuman, 1983) states that affective influences dominate cognitive influences in situations requiring little or no elaboration. Retail atmospherics research by Baker (2002, 1987) suggested cognitively processed cues are dominant over ambient cues, which affect the subconscious. Ambient cue effects may therefore be diminished or nullified depending on the degree of competition from cognitively processed cues. Baker's research corroborates ELM theory, which indicates low-level processing for peripheral cues. Mazursky and Ganzach (1998) found if involvement was delayed (i.e., not induced before or concurrently with information acquisition), positive affective transfer could occur under situations of low and high involvement.

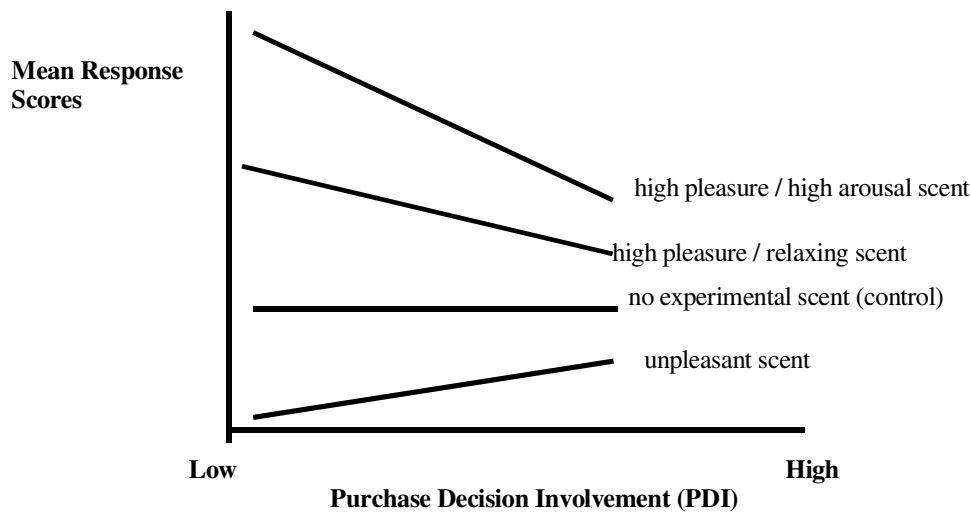


FIGURE III. PDI AS A MODERATOR OF THE RELATIONSHIP BETWEEN SCENT HEDONICS AND SHOPPER RESPONSES

As illustrated in Figure III, the study proposes that peripheral scent cues have greater influence on shopper responses in situations of low rather than high purchase PDI, and that arousal plays a role in this relationship. Arousal theory states that arousal intensifies other affective feeling states (Gilligan & Bower, 1984). And in the context of atmospheric research, suggests that increased arousal may intensify subjects' evaluations of an environment and its contents (Russell & Pratt, 1980). Olfactory researchers Ludvigson and Rottman (1989) found scents low in activation (arousal) properties induced a relaxing effect. Therefore Russell and Pratt's (1980) proposition that arousal intensifies evaluations may be tested by comparing the effects of a pleasant and highly arousing ambient scent, to one that is pleasant and relaxing. Together, ELM and arousal theory suggest an increase in positive responses to pleasant and arousing ambient scents vs. the no experimental scent (control) in situations of low rather than high PDI. The response effects of pleasant/relaxing ambient scent are expected to lie somewhere between those of pleasant/arousing ambient scent, and the control condition. The moderating influence of PDI on the relationship between ambient scent pleasantness/arousal and shopper responses result in five hypotheses:

- *induction of affective feeling states*, including pleasure (H1), arousal (H2), mood (H3)
- *evaluation of the surrounding environment* (H4)
- *perception of time* (H5)

Induction of Affective Feeling States

Induced Pleasure (H1).

There is a growing body of research indicating an affective dimension to scent. The odor experience has been described as naturally hedonic (Ehrlichman & Halpern, 1988) and empirical evidence provides support for scent based affective responses (Ludvigson & Rottman, 1989). The presence of pleasant ambient scent is expected to result in elevated states of mood and pleasure in comparison to conditions of no-experimental ambient scent or unpleasant ambient scent:

- β H1a: Self reported pleasure is higher in the presence of pleasant ambient scents than in the no-experimental scent condition under conditions of low rather than high PDI.
- β H1b: Self-reported pleasure is higher in the presence of pleasant/arousing ambient scent than in the presence of pleasant/relaxing scent under conditions of low rather than high PDI.
- β H1c: Self-reported pleasure is lower in the presence of unpleasant ambient scent than in the no-experimental scent under conditions of low rather than high PDI.

Induced Arousal (H2).

Research in olfactory science demonstrates physiologically that odors differ in their ability to elicit hedonic (pleasure) and arousal responses according to their capacity to stimulate the olfactory bulb and/or trigeminal nerves respectively (Serby & Chobor, 1992). For example, lavender scent may elicit a hedonic pleasure response while simultaneously inducing a relaxing effect (Ludvigson, 1989). Peppermint has been shown to elicit a pleasant hedonic reaction while also elevating arousal. Psychology researchers Shock and Coombs (1937) found that both pleasant and unpleasant experimental odors were capable of eliciting higher levels of arousal than no experimental odor. Taken together, these findings from olfactory science and environmental psychology suggest the following four arousal related hypotheses:

- β H2a: Self-reported arousal is higher in the presence of pleasant/arousing ambient scents than in the no-experimental scent control under condition of low rather than high involvement.
- β H2b: Self reported arousal is higher in the presence of pleasant/arousing ambient scent than for pleasant/relaxing scent under conditions of low rather than high PDI.
- β H2c: Self reported arousal is higher in the presence of unpleasant/arousing ambient scent than in no experimental scent control under conditions of low rather than high PDI.
- β H2d: Self-reported arousal is lower in the presence of pleasant/relaxing ambient scent than in no experimental scent control under conditions of low rather than high PDI.

Induced Mood (H3).

Since pleasure and arousal are considered sub-components of overall mood and the effects of scent, pleasantness and arousal on mood are hypothesized to be in the same direction as for pleasure and arousal (Gardner, 1985):

- β H3a: Self reported mood is higher in the presence of pleasant ambient scents than in the no-experimental scent under condition of low rather than high involvement.
- β H3b: Self reported mood is higher in the presence of pleasant/arousing ambient scent than for pleasant/relaxing scent under conditions of low rather than high PDI.
- β H3c: Self-reported mood is lower in the presence of unpleasant ambient scent than in the no-experimental scent control for conditions of low rather than high PDI.

Evaluation of the Surrounding Environment (H4).

Eaton (1989) proposed that cues in the environment aid individuals in making inferences concerning environmental contents. The mechanism by which this inference occurs has been described as affective transfer (Mehrabian & Russell, 1974; Russell & Pratt, 1980). Store image research suggests that retail store atmosphere is comprised of aural, visual, tactile, and olfactory elements (Kotler, 1973; Mazursky & Jacoby, 1986; Baker, 1994). In accordance with ELM and arousal theories, the introduction of a more pleasant and/or pleasantly arousing olfactory condition should yield a more positive evaluation of the store environment under conditions of low, rather than high purchase decision involvement:

- β H4a: Evaluations of the surrounding environment are higher in the presence of pleasant ambient scents than in the no-experimental scent condition under conditions of low rather than high PDI.
- β H4b: Evaluations of the surrounding environment are higher in the presence of pleasant/arousing ambient scent than in the presence of pleasant/relaxing scent under conditions of low rather than high PDI.

Conversely, the introduction of an unpleasant ambient scent is expected to lead to a more negative evaluation of the surrounding environment under low PDI conditions:

- β H4c: Evaluations of the surrounding environment are lower in the presence of unpleasant ambient scent than in the no-experimental scent (control) under conditions of low rather than high PDI.

Evaluation of Perceived Time (H5).

Regarding subjects' temporal perspective (perception of time), Spangenberg (1996) found that exposure to a pleasant ambient scent caused shoppers to perceive that they spent less time shopping than had actually elapsed. The current study re-tests the temporal effect of pleasant scent on perceived time, and introduces two additional propositions: (1) that the opposite effect occurs in the presence of unpleasant ambient scent (i.e., perceived time is greater than actual time), and (2) that the perception of time is also influenced by arousal and involvement levels. Donovan and Rossiter (1982) for example, found that arousal, or store-induced feelings of alertness and excitement, increased the time subjects spent in the store and increased their willingness to interact with store personnel. These findings combined with ELM theory discussed previously, suggest that the hypothesized effects are expected to intensify under conditions of low rather than high PDI. Therefore, in the current study, for a given level of scent pleasantness, increasing arousal is hypothesized to increase perceived time as a percentage of actual time:

- β H5a: Perceived time is less than actual time in the presence of pleasant ambient scent when purchase decision involvement is low rather than high.
- β H5b: Perceived time is a greater percentage of actual time for pleasant/high arousing scents than for pleasant/relaxing scents when purchase decision involvement is low rather than high.

Conversely, decreasing the level of arousal in the presence of unpleasant ambient scent is expected to increase perceived time as a percentage of actual time:

- β H5c: Perceived time is greater than actual time in the presence of unpleasant ambient scent when purchase decision involvement is low rather than high.

In summary, the hypotheses test the effects of an ambient scent's underlying physical stimulus dimensions (i.e., pleasantness, arousal, and mood inducing qualities) on affective feeling state induction and subsequent affective transfer to a shopper's responses (i.e., evaluations, intentions, and perceptions). Also examined is the moderating influence of situational changes in purchase decision involvement (PDI) on this relationship. The next section describes the methodology used to test the hypotheses, including the sample, scent stimuli, products, and PDI manipulation.

METHODOLOGY

Overview

A laboratory experiment was disguised as a shopper survey. A between subjects factorial design tested for the main effects of ambient scent on shopper responses, the mediating influence of affective state, and the moderating influence of purchase decision involvement (PDI). Subjects in all eight cells evaluated the same set of products within the same laboratory setting. Each of the eight subject cells in the main study was exposed to only one of the four levels of ambient scent and one of two levels of PDI (Figure IV). Proven pencil and paper instruments were used to evaluate products and the environment, to assess self-reported feeling states of mood, pleasure and arousal, to assess subjects' perception of shopping time, and to measure purchase intent and degree of liking. Univariate comparisons were made for individual response measures, and the analysis of results for each subcategory of dependent shopper responses was reported as MANOVA overall F-tests to control for Type I error. The moderating influence of PDI was represented as the interaction of PDI and Scent Condition in ANOVA and MANOVA analysis. A detailed explanation of the research design, procedures, and statistical analysis employed follows.

Between Subjects Factor	Pleasant/ Arousing Scent		Pleasant/ Less- Arousing Scent		Unpleasant/ Scent		No-Scent Control	
	<i>High PDI</i>	<i>Low PDI</i>	<i>High PDI</i>	<i>Low PDI</i>	<i>High PDI</i>	<i>Low PDI</i>	<i>High PDI</i>	<i>Low PDI</i>
Cell #	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>

FIGURE IV. FACTORIAL DESIGN: FOUR SCENT CONDITIONS BY TWO INVOLVEMENT LEVELS

An on-campus shopper survey provided the disguise for the true purpose of the experiment. PDI was manipulated by varying the shopping scenario including the survey facilitator, shopping instructions, and cover story. The between-subjects design proved superior in preventing hypothesis guessing even in the presence of very noticeable levels of ambient scent. For example, for cells in which any subject(s) mentioned the presence of an odor when entering the facility, survey facilitators quickly deflected the comment by mentioning that the carpet and flooring had just been cleaned. The presence of “Wet Floor” markers aided in disguising the true purpose of the experiment. This method of disinformation would not likely work more than once with each subject cell. A within subjects design is, therefore, unsuited and would likely result in a considerable amount of hypothesis guessing. Additionally, repeated testing of the same subjects in a within-subjects design would also be more susceptible to collaboration among respondents. A longitudinal within-subjects design, particularly one relying on voluntary participation, may result in several subjects missing one or more sessions causing numerous gaps in the data set. Some subjects might even drop out of the study altogether. The 4 x 2 cross sectional between-subjects factorial design significantly reduced or eliminated all of these threats to internal validity.

Subjects

Pre-testing and the main study were conducted on the campus of a mid-size northeastern state university of 13,000 students and a total of 689 students participated. To prevent collaboration among subjects, participants in the pretests were from different majors and campus locations.

Setting

A modern on-campus focus group facility served as the site for the main study. The site was equipped for videotaping, allowing enhanced review of all cells. Moreover, the facility afforded control over scent levels and other atmospheric elements as was equipped with its own ventilation system and controllable sources of lighting (fluorescent, incandescent, and natural).

Cover Story and Shopping Instructions

The cover story and shopping instructions were varied to achieve low and high levels of purchase decision involvement. A research assistant greeted subjects as they entered the test facility. To avoid introducing any unwanted olfactory stimuli, the assistant was asked not to wear any perfume or other scented cosmetic. Subjects were also instructed not to bring any food or drink into the facility. Upon entering the focus group room, a brief description of the facility was provided to facilitate the cover story, and ensure that subjects in the odorized cells had a few minutes to react to the ambient scent. Next, an overhead presentation provided instructions and informed participants they would be evaluating a set of products by writing their individual evaluation responses in a booklet. The (disguised) purpose of the research was then presented and the cover story, shopping instructions, and moderator were varied to achieve the desired PDI level.

High PDI Cover Story

A professor conveyed the survey cover story was that a new type of vending machine was about to be test marketed on college campuses. The machines would accept debit cards in addition to cash, and offer non-food, non-tobacco, and non-beverage items. Subjects were told they would be helping to determine the products to be sold on their campus in the very near future. They were also told that client observers were viewing them from behind the one-way mirror. The research

facilitator also made explicit references to the audio and videotaping capabilities of the facility, pointing out the microphones located in the ceiling. A “Clients Only” sign was posted on the closed door of the client observation room. The facilitator also purposely made a few comments to clients (who were actually colleagues) in the observation room to enhance the disguise.

Low PDI Cover Story

An undergraduate research assistant briefed the subjects that a vendor of school supplies was interested in marketing its product line to college students in neighboring states. Subjects were advised that any future test market would occur out-of-state and the products would be unavailable on their own campus for two years. No mention was made of any new type vending machines. The door to the client observation room was left open, and S’s were told no clients would be arriving anytime that day.

High PDI Shopping Instructions

Subjects were asked to *carefully examine* the products as if it was a week before the school year and they were actively shopping for supplies. Products evaluated included plastic ballpoint pens, 22-karat plated ballpoint pens, mechanical pencils, and compact data storage diskettes.

Low PDI Shopping Instructions

Subjects were instructed to shop as if they were *casually browsing*, with no particular need for any of the four products and not to spend too much time dwelling on (their) responses.

STATISTICAL MODELS

Modeling Affective Induction and Transfer

Principal Components (PC) data reduction analysis with an orthogonal rotation was used to assess the effects of ambient scent on the induction of affective states of pleasure, arousal, and mood, and on subsequent affective state transfer to feelings about the environment and its contents. Sixteen scale items comprised the self-reported affective states of pleasure, arousal, and mood, including Mehrabian and Russell’s (1974) pleasure and arousal scales at six items each were combined with Peterson and Sauber’s (1983) four-item Mood Short Form (MSF) scale. Research suggests pleasure and arousal are orthogonal and described by separate independent factors (Mehrabian & Russell, 1974; Russell & Pratt, 1980; Crowley, 1993; Spangenberg et. al., 1996). Research on the effects of mood in general (Gardner, 1985), and ambient scent on mood (Knasko, 1992a, 1992b; Spangenberg, 1996; Bone & Ellen, 1999) suggests that the effects of ambient scent on mood may be subtle at best, yielding the smallest factor in a three-factor solution (i.e., smallest Eigen value).

Modeling Purchase Decision Involvement (PDI)

To test the hypothesized moderating interaction of PDI and scent on shopper responses, multivariate analysis of variance (MANOVA) was among the statistical techniques utilized. MANOVA is appropriate since the experiment tests the effects of two independent factors (ambient scent and PDI) on two dependent variables (evaluations of the environment and perceived time) that are believed to be related. Using MANOVA is also preferred because it is a more powerful test, which controls for the type I experiment-wide error rate associated with using multiple ANOVAs. If MANOVA detects a significant difference, post hoc testing will be

employed to determine which of the dependent groups contributed to the overall difference. Bonferroni's test of inequality will be used when comparing more than two groups to control for the inflation of Type I error rate (e.g., testing effects among the four scent treatments). Separate univariate tests may also be used to further examine individual variables (e.g., if and to what degree an individual scale item contributed to an overall significant difference of measures).

ANALYSIS & RESULTS

Scent Selection

Pre-testing corroborated expert opinion as Clementine and Vanilla scents surfaced as those, which best induced the desired combinations of pleasant/arousing, and pleasant/relaxing feelings respectively. Galbanum was the only unpleasant tested because unlike most other malodorous substances available, it is completely non-toxic. Pre-testing confirmed galbanum elicited the intended unpleasant/arousing response.

Affective State Induction

Analysis of variance and t-testing indicated that both PDI and scent pleasantness were successfully manipulated to the degree and direction desired (Figure V).

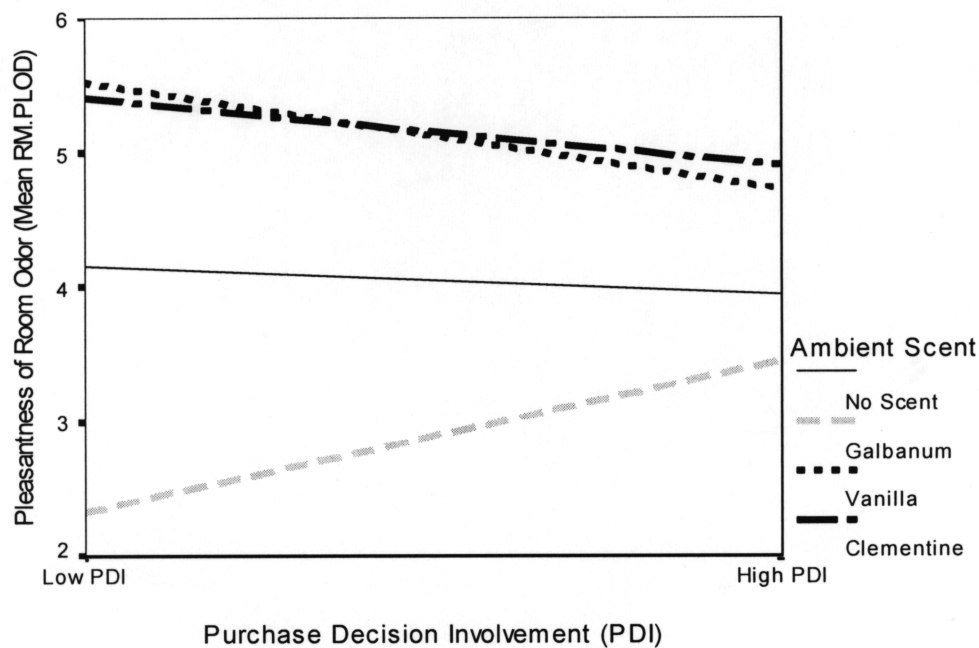


FIGURE V. PERCEIVED ROOM ODOR PLEASANTNESS (4 SCENTS X 2 PDI'S)

MANOVA analysis indicated a significant effect of scent on perceived room pleasantness ($p=.000$), and a significant interactive effect of PDI by scent on room odor pleasantness ($p=.000$). Bonferroni comparisons of room odor pleasantness by scent for both low and high PDI treatment levels support ELM theory in that the peripheral scent cues were more attended to under conditions of low rather than high involvement. Specifically, there was a significant difference in perceived odor pleasantness between the pleasant scent treatments and the no scent control for low PDI only.

Under the high PDI condition, a significant difference was detected only when comparing the extreme situational differences of subjects exposed to a very pleasant scent, to those exposed to a very unpleasant scent. Bonferroni comparisons between scents under low and high PDI reveal that the effects of ambient scent hedonic and activation dimensions on perception of room odor pleasantness may result in significant support for hypotheses H#a and H#c in each of the first three hypotheses tested. For example, perceived room odor pleasantness varied under low PDI to the degree and in the direction needed to support H1a and H1c, but not H1b:

- β H1a: Pleasant Scent Environmental Evaluations > No Scent Enviro. Evaluations – supported
- β H1b: Pleasant/Arousing Scent Evaluations > Pleasant/Relaxing Scent Evaluations (i.e., Clementine > Vanilla) – Not supported
- β H1c: Unpleasant Scent Evaluations < No Scent Evaluations – supported

MANOVA and ANOVA analyses results summarized in Table I indicate there was no discernable interactive effect of arousal—arousal simply did not intensify pleasure as hypothesized. Subjects exposed to the pleasant/arousing Clementine scent reported feeling states of pleasure, arousal, and mood, which were not significantly different from subjects exposed to pleasant/relaxing Vanilla . The successful manipulation of room odor pleasantness in this controlled experiment does provide evidence that affective state induction was due to exposure to ambient scent.

TABLE I. RESULTS OF HYPOTHESEIS TESTING OF AFFECTIVE STATE INDUCTION

<i>Hypothesized Induction of Affective State</i>	Hypothesized vs. Observed Scent Comparison		
	<i>H(#)^a</i>	<i>H(#)^b</i>	<i>H(#)^c</i>
	<i>pleasant scent > no scent</i>	<i>pleasant/arousing > pleasant relaxing</i>	<i>unpleasant/arousing < no scent</i>
H(1) <u>Induced Pleasure</u> (scale -24 to +24)	Clementine 16.55 > 5.90*** Vanilla 15.98 > 5.90**	n.s.	Galbanum -.86 < 5.90*
H(3) <u>Induced Mood</u> (scale 5 to 20)	Clementine 16.55 > 13.23*** Vanilla 15.98 > 13.23**	n.s.	Galbanum -.86 < 5.90*
	<i>pleasant scent > no scent</i>	<i>pleasant/arousing > pleasant relaxing</i>	<i>unpleasant/arousing > no scent</i>
H(2) <u>Induced Arousal</u> (scale -24 to +24)	Clementine: 7.32 > 0.15** Vanilla: -6.34 > 0.15*	Clementine 7.32 > Vanilla -6.34 ***	Galbanum 7.70 > 15**

* $p < .05$; ** $p < .01$; *** $p < .001$; n.s. = not significant

As hypothesized, a significant interactive effect existed between scent and PDI, such that pleasure, arousal, and mood states each differed significantly between scents when under conditions of low rather than high PDI. Low PDI subjects reported more positive/negative feeling states, and higher/lower evolutions of their physical surroundings, when exposed to pleasant/unpleasant scents, than those in the no-experimental scent condition. Again, pleasure and arousal dimensions were found not to interact, with those exposed to pleasant/arousing scent provide evaluations of the environment not significantly different from those exposed to the pleasant/relaxing scent treatment. If the evaluation outcomes were so similar, perhaps the underlying mechanisms were not different.

Principal Components Analysis of Affective States

Principal Components (PC) analysis was conducted of all 16 affective state scale items simultaneously (six pleasure, six arousal, and four mood items) to ensure that pleasure and arousal were elicited as intended. The results confirmed that pleasure, arousal, and mood loaded as orthogonal (independent) factors, and in the order predicted. Pleasure accounted for a dominant 48.8% of overall affective state loading, arousal for 23.9%, and mood a subtle but significant 6%. Factors 1 and 2 therefore corroborate the Mehrabian and Russell (1974) assertion that pleasure and arousal are prime affective dimensions, and that mood is at best a distant third. Statistical assumptions were met as Kaiser-Meyer-Olkin's measure of sampling adequacy was confirmed at .912, and Bartlett's Test of Sphericity found significant at the .000 level. Additional statistical analysis corroborated the intended manipulations of low/high PDI and pleasant/unpleasant scent. A resulting scree plot (Figure VI) illustrates the three-factor solution, with subsequent factors in the tail adding much less explanation of variance.

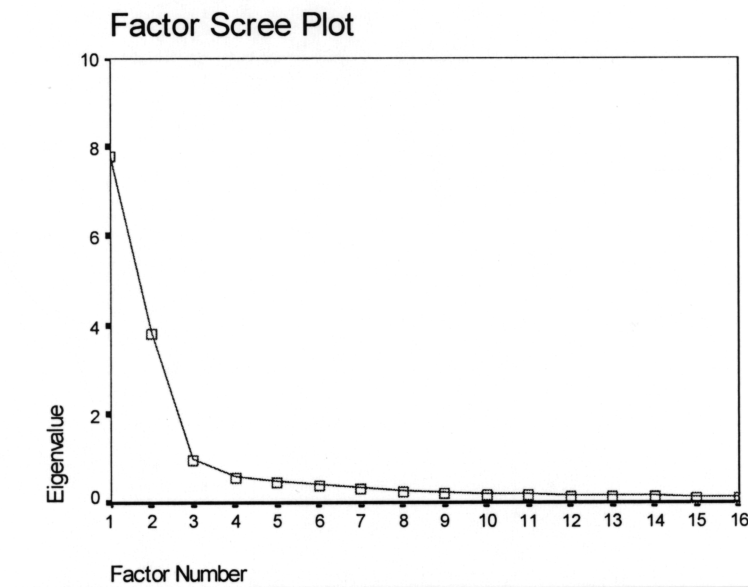


FIGURE VI. SCREE PLOT OF 16 FISHER SCALE ITEMS

By plotting the factor matrix in rotated space (Figure VII), we confirm pleasure, arousal, and mood as independent orthogonal dimensions (Mehrabian & Russell, 1974; Russell & Pratt, 1980).

Factor Plot in Rotated Factor Space

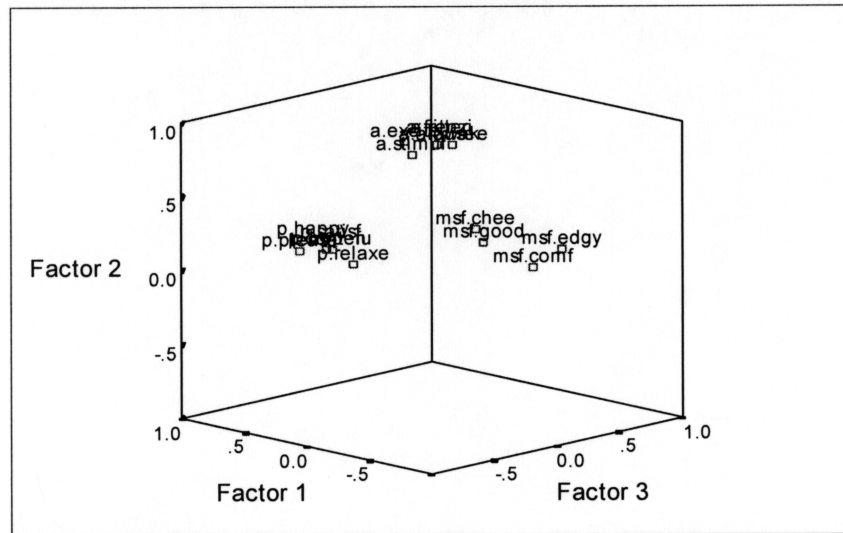


FIGURE VII. FACTOR PLOT OF PLEASURE, AROUSAL, MOOD

Evaluation of Physical Environment

The results of factor loading indicate that since hedonics trumps activation and mood, an unpleasant scent should have a dominant and deleterious effect on environmental evaluations, and perhaps on other shopper responses. Not surprisingly, subjects exposed to the unpleasant scent condition (galbanum) reported significantly lower environmental ratings and perceived times, which were significantly greater percentages of actual time than subjects in the no scent control. Moreover, this difference was found to be significant for both the low and high PDI conditions, not just for subjects in the low PDI treatment as predicted.

Fisher's (1974) Judgment of Environmental Quality scale was used to assess evaluations of the environment, and was found reliable with a Cronbach's alpha of .9401. The mean room evaluation scores ("RM.FISHR") for the eight treatment cells (4 scent conditions and two levels of PDI) are plotted in Figure VIII. The plot illustrates that evaluations of the environment appear to differ across scent treatments more under conditions of low rather than high PDI. Additionally, the unpleasant/arousing scent treatment (galbanum) appears to differ from the other three scent conditions for both the low and high PDI conditions.

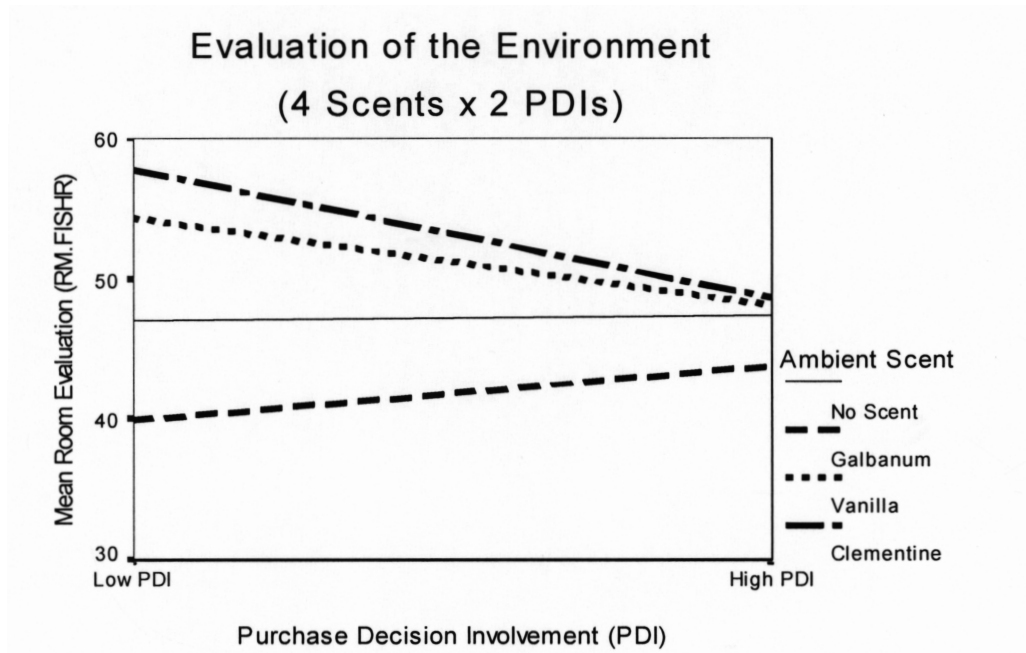


FIGURE VIII. EVALUATION OF THE PHYSICAL ENVIRONMENT

MANOVA analysis confirmed significant differences in the evaluation of the physical environment between scent treatments resulting from an interactive effect between scent and PDI for low but not high PDI. Univariate analysis showed the significance difference existed for all 12 Fisher scale items for low PDI. Only one of the twelve items was significant under high PDI (Room Brightness). Hypotheses testing of scent and PDI on subjects' evaluations of the physical environment was conducted using Bonferroni comparisons of room evaluation (RM.FISHR) between scent treatments to control for Type I experiment-wide error rate. As predicted, significant results were produced under conditions of low PDI only. The results of the Bonferroni comparisons between scent treatments for conditions of Low PDI are presented in Table II.

TABLE II. BONFERRONI MULTIPLE COMPARISONS OF ENVIRONMENTAL EVALUATIONS (RM.FISHR RATINGS OF BETWEEN-SCENT TREATMENTS FOR LOW PDI)

Ambient Scent		Mean Diff. (I-J)	Std. Error	Hypothesis Tested	Sig.	95% Confidence Interval	
(I)	(J)					Lower Bound	Upper Bound
No Scent 47.05	Vanilla 54.29	-7.14	2.950	H4a	.075	-14.91	.42
No Scent 47.05	Clementine 57.74	-10.69*	2.922	H4a	.002	-18.50	-2.87
No Scent 47.05	Pleasant 55.95	-8.90*	2.482	H4a	.001	-14.91	-2.89
Vanilla 54.29	Clementine 57.74	-3.44	2.852	H4b	1.000	-11.07	4.08
No Scent 47.05	Galbanum 39.08	7.97*	2.907	H4c	.041	-.20	15.74

* The mean difference is significant at the .05 level.

An examination of the Bonferroni comparisons under conditions of low PDI in Table II indicates

support for two of the three environmental evaluation hypotheses:

- β H4a: Evaluations of the surrounding environment are higher in the presence of pleasant ambient scents than in the no-experimental scent condition under conditions of low rather than high purchase decision involvement (PDI).
Support for Clementine and Vanilla (Pleasant Scents) combined – significant support Clementine; near support for Vanilla:
Pleasant Scents (55.95) > No Scent (47.05); Fisher mean difference 8.90; $p=.001$
Clementine (57.74) > No Scent (47.05); Fisher mean difference 10.69; $p=.002$
Vanilla (54.29) > No Scent (47.05); Fisher mean difference 7.24; $p=.075$
- β H4b: Evaluations of the surrounding environment are higher in the presence of pleasant/arousing ambient scent than in the presence of pleasant/relaxing scent under conditions of low rather than high PDI.
Not supported: There is no significant difference between the room evaluations of subjects exposed to Clementine and those exposed to Vanilla:
Clementine (57.74) > Vanilla (54.29); Fisher mean difference 3.44; $p=1.000$
- β H4c: Evaluations of the surrounding environment lower in the presence of unpleasant ambient scent than in the no-experimental scent control under conditions of low rather than high PDI.
Supported: Galbanum (39.08) < No Scent (47.05); Fisher mean difference 7.97; $p = .041$

Perceived Time

The between subjects comparison of perceived shopping time vs. actual shopping time provided partial support for only one of the three time perception hypotheses. As expected, subjects exposed to the unpleasant scent condition (galbanum), reported perceived times, which were greater percentages of actual time than subjects in the no scent control. This difference was significant for both PDI conditions, not just for the low PDI treatment as predicted (Figure IX).

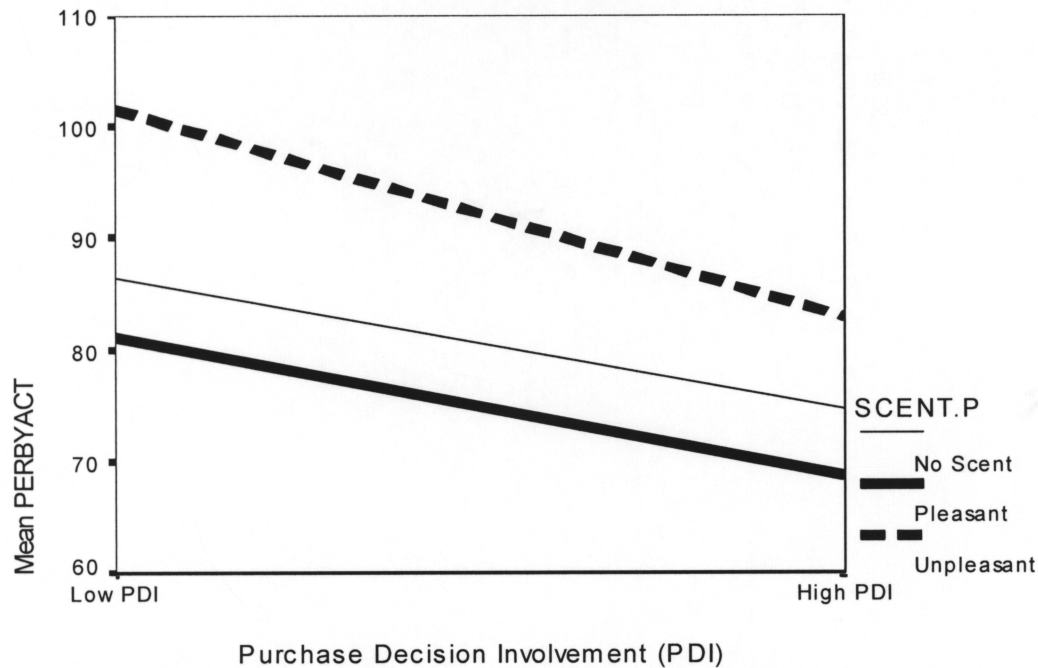


FIGURE IX. PERCEIVED SHOPPING TIME AS A PERCENTAGE OF ACTUAL TIME

Further statistical analysis corroborated the intended manipulation of PDI, degree of odor pleasantness/unpleasantness. Bonferroni comparisons of perceived shopping time as a percentage of actual time revealed that the difference between the unpleasant and the no scent treatments was significant for the low PDI condition only. This perception comparison provides partial support for H8C as originally stated:

- β H5c1: Perceived time is greater than actual time in the presence of unpleasant ambient scent when purchase decision involvement is low rather than high.

Full support is however provided for H8C when restated for the Perceived Time divided by Actual Time percentage (*PerByAct*) comparison:

- β H5c2: Perceived time is a greater percentage of actual time in the presence of unpleasant ambient scent when purchase decision involvement is low rather than high.

Additionally, although not relevant to the three, apriori hypotheses, there was a significant difference between scent treatments for the extreme comparison of unpleasant and pleasant scents. That is, time passed significantly faster for subjects exposed to pleasant scents than for those exposed to unpleasant scents. This perceptual difference held for both low and high PDI.

CONTRIBUTIONS

Calder, Phillips, and Tybout (1981) reported a distinction (in consumer research) between “effects application” and “theory application.” The primary purpose of this scientific investigation is the latter. That is, to advance the status of olfactory research, by expanding the theoretical literature linking feelings and consumer behavior in a simulated and controlled retail environment. The study also does provide managerial guidance for making changes in store

atmosphere based on serious scientific inquiry, rather than on anecdotal accounts often provided in the popular press. The theoretical and managerial implications of the study follow.

Theoretical Contribution

The study adapts a strong theoretical base from environmental psychology to the investigation of the affective state influences on consumptive behavior. The study extends the work of Russell and Pratt (1980) who first adapted Mehrabian and Russell's (1974) Stimulus-Organism-Response (S-O-R) model of environmental psychology to the study of retail atmospherics. Specifically, the current study provides empirical support for incorporating Belk's (1974) situational perspective into Stimulus-Organism-Response (S-O-R) model. The result is a more comprehensive framework for better understanding how situational influences like purchase involvement moderate the influence of scent cues on shopper evaluations and intentions. The study also expands the theoretical knowledge of affective state, by providing a seminal factor analysis test of the relative effects of pleasure, arousal, and mood.

Moderating Role of Situational Involvement

As Belk (1974, 1975) suggested, situational aspects may influence the effect of the environment on the individuals' responses to stimuli within the environment. The current study presented strong evidence that situational involvement was a significant moderator of the relationship between the affective dimensions of ambient scent and induced affective feeling states of pleasure, arousal, and mood, and of affective transfer to shopper evaluations and intentions.

Relative Effects of Pleasure, Arousal, and Mood

The current study provided the first known empirical comparison of the relative effects of pleasure, arousal, and mood. The study corroborated earlier data reduction analysis of pleasure and arousal factors, in which pleasure accounted for the dominant share of factor variation (e.g., Crowley, 1993, Spangenberg et. al., 1996). Additionally, the incorporation of mood yielded a third albeit smaller independent factor, in which all four Mood Short Form (MSF) scale items loaded heavily.

Managerial Implications

Retailers facing an increasingly competitive marketplace are finding it more difficult to differentiate their stores solely based on merchandise, price, promotion, or location. The store itself, however, can offer a unique atmosphere, or environment, that may influence the consumers' patronage decision (Kotler, 1973). **Consumers often interact with the retail environment, and finalize many of their buying decisions at retail point of purchase (Keller, 1987).**

Thus, in-store elements such as lighting, music, color and ambient scent may have more immediate effects on decision making than other marketing inputs not present at point of purchase such as radio, print and television advertising (Baker, 1994). This study offers unique insights for retail merchants on the use of ambient scent stimuli. By considering situational variables and using precise selection of scent stimuli, the proposed model is expected to improve the prediction of atmospheric effects on shopper responses. Additional implications for retailer consideration follow.

Increased Differentiation

It is increasingly difficult for retailers to differentiate based on price, promotion, merchandise, and location. Moreover, store choice may precede brand choice (Darden, 1983), and

atmospherics is a means of attracting customers to the store (Kotler, (1973). Atmospherics is therefore a powerful marketing tool for retailers to differentiate themselves from competitors--if they can understand how to use it (Kotler, 1973). The current study provides empirical evidence that selecting the right scent to differentiate the retailer is more than a matter of simply picking a scent that smells nice. Ambient scents have been shown to differ in their ability to influence shopper evaluations and intentions according to their underlying affective dimensions.

Increased Purchase Opportunities

The current research demonstrated that an ambient scent's underlying affective state dimensions interact with situational involvement to influence both environmental evaluations, and perceived time. Increasingly, many purchase decisions are being made within the store (Keller, 1987)—as many as two-thirds in some industries (Shimp, 1990). Pleasant ambient scent may therefore provide a means of increasing purchase opportunities. Ambient scent may be a particularly useful customer relations tool for retail operations marked by low levels of service and/or social interaction. That is, establishments such as discount stores, self-service catalog showrooms, and vending machine operators may find ambient scent provides a low cost means of enhancing customer attitudes toward their establishments. As Kotler (1973) stated, “atmospherics may even prove to be more influential than the product itself in influencing consumer purchase decisions.” The current study also suggests that retail settings subject to even moderately offensive odors (e.g., pet shops, stores adjacent to sewage treatment plants, paper mills, or even road construction) may wish to consider using pleasant ambient scents as an odor masking technique.

LIMITATIONS & FUTURE RESEARCH

Increasing the Scope of the Model

Designing a mood-inducing setting involves a consideration of the interaction of the setting with consumers' perceptions of other facets of the environment (Gardner, 1985). Kotler and Rath (1984) have de-emphasized the role of individual atmospheric components and have stressed the importance of the overall design of the sponsor's setting, image, and products. Future research designs might for example consider testing the interactive effects of individual atmospheric elements (e.g., the effects of music and scent on mood), and the interaction of overall atmosphere with encounters with store personnel, along with perceptions of store and product image.

Researching Affective Trace Effects

If sufficiently strong, affective traces (informational aspects of the affective response) are retrievable, and a person may “re-experience” some of the same feelings, which had occurred when previously exposed to the stimuli in the store environment. If so, a longer lasting, more highly valenced attitude change toward the store may result. A longitudinal study involving ambient scent effects may increase the application of the proposed model to the study of memory-based effects, which are longer lasting than single instances of affective state induction from exposure to ambient scent. If ambient scent induced affective traces are retrievable, do shoppers re-experience the feelings from previous visits when they re-encounter the scent inside or outside the store? For example, Victoria Secret uses a signature scent, which is a congruent blend of specific aromatic substances precisely released into the atmosphere (Peltier, 1999). If signature scents do lead to a longer lasting, more highly valenced effect, will a Victoria's Secret re-experience her store visit, when she receives a sample of signature scent at home?

Testing in Natural vs. Artificial Laboratory Settings

Laboratory settings offer excellent experimental control of potentially confounding variables, including other ambient factors that may interfere with testing of more subtle scent cues such as scent. Additionally, homogeneous samples used in college settings enhance an experiment's ability to detect differences by increasing the power of the test (Calder, Phillips, & Tybout, 1981), especially for detecting subtle effects from ambient scent (Gulas & Bloch, 1995). The artificial setting and sample homogeneity may, however, detract from the generalizability of the findings to some diverse population segments shown to differ in their scent detection and perception abilities – such as senior citizens (Murphy, Nordin, & Acosta, 1997).

Investigating Bi-Directional and Affiliation Influences of Arousal

Donovan and Rossiter (1982) suggested that inducing arousal might yield increased positive effects only in store environments already deemed pleasant, although the results of the current study suggest otherwise. They also indicated that arousal inducement might yield no influence, or even a negative influence, if induced in already unpleasant store environments. So perhaps introducing a pleasant and arousing Clementine scent, into a dirty and cluttered store will produce unintended negative shopper responses. To date there has been no study to empirically test for the bi-directional effect of arousal in a retail setting. Donovan and Rossiter also postulated an arousal-affiliation relationship that may be of particular interest to retailers with floor personnel. Specifically, they suggested more highly aroused shoppers are more likely to interact with others in the store—including sales personnel. Empirical tests of these arousal hypotheses are needed.

CONCLUSION

The current research extends the olfactory and consumer psychology literature by demonstrating that ambient scents differ in their ability to induce affective feelings, which, in turn are affectively transferred to shoppers evaluations and perceptions of their environment. The research also demonstrated for the first time that this induction and transference is situationally dependent. In support of ELM theory, the study shows that peripheral ambient scent cues influence shopper evaluations, intentions, and perceptions in situations of low rather than high involvement. Finally, the study has important implications for global marketers, suggesting that ambient scent is a potentially powerful tool by which casinos and other retail operators may enhance the evaluations of their store environment, and thereby encourage customers to remain on their premises longer.

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AN EMPIRICAL ANALYSIS OF ABI ACCEPTANCE MEASURES AND DETERMINANTS

Aretha Y. Hill, Florida A&M University
aretha.hill@famu.edu

Ira W. Bates, Florida A&M University
ira.bates@famu.edu

ABSTRACT

Contrary to many, this study contends that activity-based costing (ABC) success ultimately depends on user acceptance of activity-based information (ABI) in the early stages of the ABC system implementation. The results of this study reveal that the level of effort required to use ABI will have a significant influence on user acceptance of ABI. The findings also suggest that the expected benefits of using ABI, use of ABI, and satisfaction with ABI are related to the complexity of the users' task activities and level of involvement in the ABC system design.

INTRODUCTION

Activity-based costing (ABC) systems have become very popular for providing improved cost data for products and services. However, in recent years both practitioners and researchers are increasingly evaluating whether activity based management (ABCM) is effective as a cost management strategy.¹ This recent skepticism is attributed to the growing evidence that many organizations are achieving performance gains from their ABC systems while others are not (Johnson, 1992; Shields, 1995; Gosselin, 1997).

While many prior ABC studies focused primarily on issues related to the ABC system and its implementation, in general, little information is available on the behavioral effects of ABI and user environment on ABC acceptance. The aim of this study is to further understand the individual-level factors that may influence the effective use of ABI, the latter resulting in sub-optimal decision-making and an unsuccessful ABC endeavor. This study differs from many related ABC implementation and success research in that it focuses on the effects of task complexity, user involvement in the ABC system design, adequacy of ABI training received, and the level of effort required to use ABI on user acceptance of the information (perceived usefulness, user satisfaction and ABI use) in the early stages of the ABC system implementation. It is plausible that user rejection (i.e., dissatisfaction with or lack of use) of ABI may create major challenges for the organizations, such that the success of the ABC endeavor is impeded. Since organizations expend considerable resources to implement and maintain ABC systems, insight about factors that may hinder employees from effectively using or relying on ABI in performing their job task should be of great importance to practitioners.

The premise of this study is that managing operations and performance using ABI is by nature a complex process that involves the use of accurate and reliable information to cope with the

increasing complexity in companies' operating environment. Accordingly, in this paper, user acceptance of ABI is considered the foremost antecedent of success of an ABC system. This study explores task complexity, ease of using the ABI, user involvement in the ABC system design, and the adequacy of training as determinants of user acceptance of ABI. Univariate results of one-way analysis of variances (ANOVA) and regression techniques are utilized to analyze Web survey data collected from employees at various levels throughout a large Canadian telecommunication firm that has recently implemented ABC and is working towards full integration.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Activity-based costing management is a continuous management philosophy that involves the use of an ABC system, a multi-functional management information tool, to provide ABI to cope with the increasing complexity in companies' operating environment. Interestingly, many ABC systems are actually implemented and to some extent used, but many not be considered successful because there is no action taken on the information provided (e.g., elimination of non-valued-added activities) or improved decision-making performance (e.g., product costing and pricing). It is probable that the uniqueness of the information provided by the ABC system (e.g., costs are accumulated based on activities which can be voluminous and span across functional areas) will have an impact on the extent to which users will accept ABI, process the information and believe that it is unreliable or irrelevant for decision-making.

The results of several ABC studies examining organizational members' acceptance of ABC systems report mixed results. For instance, Shields (1995), Swenson (1995), and McGowan and Klammer (1997) reported that relative to their traditional systems, managers are satisfied with the results produced by their ABC system. However, the results of the studies provide evidence that an increasing number of ABC adopters are experiencing problems getting their employees to take actions based on activity-based information (ABI) and in some cases, have abandoned their ABC initiatives (Weytens & Bruggeman, 1994; Player and Keys, 1995; Shields, 1995; Anderson and Young, 1999). We suggest that employees may reject ABI if they are facing complex job tasks and decisions, believe that the information is difficult to use, experiencing task overload and/or did not receive effective training on the selection and effective use of ABI.

Task Complexity

Task complexity refers to the analyzability of the task and the extent to which the task can be performed by following formal or well-defined procedures or steps (i.e., availability of specific task knowledge). The complexity of work requirements has a significant influence on the degree of task structure (Galbraith, 1977), the information processing requirements and capacity, and task performance due to the demands it places on a person's knowledge, skills and resources (Wood, 1986). Task complexity has been found to be positively related to functional information search and use, system usage behaviors (Blili et al., 1998; Kim et al., 1998) and user perceptions and attitudes (Davis et al., 1989; Igarria, 1990; Thompson, 1994; Kim et al., 1998). The results of these studies suggest that individuals use and are more satisfied with system output if they believe that the information helps them cope with task complexity, increase task performance, and is reasonably easy to use (Gul & Chia, 1994; Chong, 1996).

Turney (1991) postulates that ABC systems are better suited to provide broad scope, yet task-specific information, than traditional costing systems. ABC systems facilitates "what if" analysis

and allows users to continuously restructure the data while exercising control over the type, aggregation level, and timeliness of the information. Therefore, individuals that have to make decisions in a highly uncertain complex environment may consider the diversity and amount of information provided in ABC reports useful in increasing information processing capacity (i.e., reducing uncertainty) and enhancing decision quality. These individuals may use ABI to a greater extent and be more satisfied with the information. On the other hand, the use of broad scope yet detailed “standardized” and irrelevant ABI, in conditions where tasks and events are fairly difficult, may result in task overload, unfavorable perceptions, and possibly sub-optimal use of ABI and less satisfaction.

The use of ABI when task complexity is low, likewise, may create unfavorable user perceptions. For instance, low analyzable tasks require less precise, yet richer, information and information processing than simple and routine tasks (Ghani, 1992). When individuals are faced with more analyzable and routine task activities, the use of detailed “standardized” ABC reports may be viewed as irrelevant or redundant and interfere with their simple information needs. Detail information processing and the use of ABC reports may contribute to individuals wasting time and resources on relatively effortless tasks and decisions. As a result, individuals may have unfavorable perceptions and attitudes regarding the usefulness of ABI.

- H1a:** Users’ perception regarding the usefulness of ABI is negatively associated with the complexity of their job-related tasks.
- H1b:** ABI usage is negatively associated with the complexity of job-related tasks.
- H1c:** Users’ satisfaction with ABI is negatively associated with the complexity of their job-related tasks.

Ease of Use

Ease of use refers to the degree to which an individual believes that using a system and its output is effortless. Self-efficacy theory suggests that perceived ease of use is one of the basic determinants of information system use behaviors and perceived usefulness (Davis et al., 1989; Adams et al., 1992; Davis, 1993; Igbaria et al., 1997). The results of numerous empirical studies support the importance of perceived ease of use and its association with perceived usefulness and technology acceptance (Chau, 1996; Igbaria et al., 1997).

With regards to ABC systems, Turney (1991) maintain that the systems produce readily accessible information that is fairly ease to use. However, Waeytens and Bruggeman (1994) found that some employees felt that the ABI was too complex and ambiguous for product costing and managerial functions. The challenge of system designers is to develop functional capabilities and output formats that are easy to use while providing relevant information that is reasonably effortless to comprehend. A system that does not enable workers perform their jobs effortlessly is not likely to be received favorably even when the implementation has been handled carefully. If this philosophy holds, then users who believe that using ABI requires less effort are more likely to use the information. Based on the above discussion, it is anticipated that individuals are more likely to use and have favorable opinions of ABI to the extent that the information is fairly easy to use.

- H2a:** Users’ perception regarding the usefulness of ABI is positively associated with the ease of using ABI.
- H2b:** ABI usage is positively associated with the ease of using ABI.

H2c: Users' satisfaction with ABI is positively associated with the ease of using ABI.

User Involvement

Employee participation in the development of a new computer information system is a critical factor in user acceptance of the system (Olson & Ives, 1981; Lucas et al., 1990; Guimaraes et al., 1992). Prior literature suggests that user involvement has a positive effect on system success by providing increased knowledge about the targeted user groups and a more reliable assessment of their informational needs. User participation also facilitates system ownership, user acceptance, and understanding of the system (Lucas, 1975). User involvement has also been linked to ABC implementation outcome (McGowan & Klammer, 1997; Krumwiede, 1998). They suggest that user involvement in the ABC implementation may reduce unrealistic expectations and resistance to the change. We expect that when relevant information, obtained from individuals most knowledgeable, is included in the design of the ABC system, employees are more likely to have positive attitudes towards its usefulness and may also lead to the development of a system that is easier to understand and use.

Franz and Robey (1986), however, suggest that it is plausible that despite user involvement in the system development, the actual system may not fit users' needs or expectations and create unfavorable perceptions of ABI. For instance, if employees' involvement in the implementation is limited to mere inclusion or representation in the implementation meetings, but their suggestions and comments are not considered. When employees only provide input regarding their information needs, but are not involved in the design aspects of the ABC system, they may have unfavorable perceptions of the ease of using the information. As such, employees may feel that ABI is not useful in performing task and decision-making activities.

- H3a:** Users' perception regarding the usefulness of ABI is positively associated with their involvement in the ABC system design.
- H3b:** ABI usage is positively associated with their involvement in the ABC system design.
- H3c:** Users' satisfaction with ABI is positively associated with their involvement in the ABC system design.

User Training

The results of numerous Management Information System (MIS) research studies suggest that there is significant and positive relationship between the adequacy of user training received and system success (Saunders & Courtney, 1985; Raymond, 1990; Guimaraes et al., 1992; Igbaria et al., 1997). Adequate user training has also been linked to ABC implementation outcome (Foster & Swenson, 1997; McGowan & Klammer, 1997; Krumwiede, 1998). The level of personal computing training provided is critical to the acceptance of most technological innovations in organizations (Raymond, 1990). Because individuals differ in their cognitive structure, decision-making style, and job responsibilities, their level and type of training requirements will also vary. Therefore, the nature of the training may also influence the acceptance of a technological innovation. Shields (1995) contend that user training is a mechanism to enable employees to understand the ABC philosophy and its benefits, effectively use ABI, reduce system and change apprehension, and foster non-accounting system ownership. The following hypotheses will be tested to evaluate the relationship between user acceptance of ABI and contextual factors:

- H4a:** Users' perception regarding the usefulness of ABI is positively associated with the adequacy of ABI training received.
- H4b:** ABI usage is positively associated with the adequacy of ABI training received.
- H4c:** Users' satisfaction with ABI is positively associated with the adequacy of ABI training received.

In addition, the following "fit" hypotheses relate to the motivation that the level of task complexity as well as the adequacy of the ABI training received will affect an individual's information needs, perceptions of information sources, intentions, and behaviors.

- H5:** Perceptions and acceptance of ABI will be more favorable for individuals facing highly complex tasks activities than for individuals facing lower complex task activities.
- H6:** Users perceptions and acceptance of ABI will differ significantly across the adequacy of the ABI training received.

METHODOLOGY

The company (hereinafter referred to as the "company") is a major Canadian provider of telecommunications services, including voice, data and video, wireless, and Internet access to a broad global customer base. The company participating in the study was selected based on the criteria that it had completed an ABC system implementation within the last five years. The top-down implementation of ABC began in 1995 as a company-wide initiative. With assistance from external consultants, the company has developed and implemented proprietary ABC software. After approximately one year, the company completed its initial ABC model and began using ABI in 1996.² In regards to training, a one-day ABC education and awareness course was held during the implementation phase. Periodic training sessions and technical assistance is provided on an as needed basis.

The finance unit has ownership of the ABC system. The ABC system is used along with the traditional cost management system to provide "richer company-wide data to facilitate cost management and profitability assessment while providing more detailed data for specific areas (e.g., billing). Specifically, the system pulls all cost data from the company's accounting system. Costs are then traced to work activities that are causally linked to the applicable processes or cost objects. The system is comprised of two primary models: (1) activity and (2) cost and product. These models include very detailed cost categories (for each activity and cost object combination) with over 350 activities, 2 levels of cost drivers, 60 products, and 20 markets. The activity model (i.e., cost and activity process reporting) is updated monthly, whereas the cost and product model (i.e., profitability data by product and market) is updated quarterly. The ABC system is integrated with an on-line analytical processing tool that permits full web-based functionality, integration, and multiple hierarchies. Users are able to simultaneously share, retrieve, analyze and summarize the ABI cost and profitability data in multiple dimensions and perform "what if" analyses. Quarterly profitability reports are also produced using ABI.

At the time of data collection, ABI was being used to facilitate strategic decision-making (including activity based budgeting) and customer billing across the company. Senior corporate personnel, unit managers and operating managers/supervisors were being encouraged to utilize ABI to support process improvement, cost analysis, cost reduction and profitability assessment and other operational decisions (not the initial objective). The areas that use ABI most frequently

are corporate finance and marketing areas. Employees and managers in operations, customer service, and quality control also make frequent use of ABI.

Data Collection

All company employees listed on the company's ABC system access database were asked by the company's ABC Director to participate in the Internet survey. Individuals from various functional areas and at various employment levels were asked to complete the web survey.³ A total of 70 out of 169 potential ABI users completed the web survey, resulting in a response rate of 41 percent.⁴ Approximately half (47.1%) of the respondents reported that they were upper or middle management and upper-level supervisors; approximately 34.3 percent are analysts and lower-level supervisors. Although approximately 44.3 percent of respondents indicated they have between 16 and 25 years of work-related experience (average = 18 years), 70.1 percent of respondents reported being employed in their current positions for five years or less. Approximately 84.3 percent of respondents are employed in four functional areas: corporate finance (15.7%), operations finance (24.3%), operations and product management (30%), and marketing (14.3%). In terms of the highest level of education obtained, approximately 64.3 percent of respondents have either a college diploma or university bachelor's degree, while 11.4 percent have a master's degree.

Measurement and Psychometric Assessment of Variables

ABI acceptance is operationalized using three widely used and related (self-reported) surrogates of technology acceptance: perceived usefulness (Igbaria et al., 1997), use (Doll & Torkszadeh, 1989; McGowan, 1997), and user satisfaction (McGowan, 1997). The score of each research variable is obtained by forming a composite measurement scale using the average of all the survey items with a principal component loading greater than 0.50 (i.e., unidimensionality) on the variable (Hair et al., 1998). The convergent validity (reliability) of the variables is assessed using Cronbach's alpha and a composite reliability (CR) index. A Cronbach's alpha coefficient greater than 0.60 and a CR index greater than 0.80 are the recommended minimum levels for evidence of convergent validity (Hair et al., 1998).

Task complexity is measured using Sander and Courtney's (1985) modified version of Van De Ven and Ferry's (1980) organizational assessment instrument. Respondents are asked to respond to three questions describing the level of complexity of their task activities relating to the extent of problems encountered and time spent solving problems.⁵ The results of the PCA revealed that all items loaded on to a single factor (eigenvalue = 1.46, variance explained = 48.73%). Ease of use refers to the extent to which users perceive ABI as relatively easy to comprehend and use when performing decision-making and task activities. The six items used to measure the perceived ease of use variable were adapted from Davis (1993). The results of the PCA revealed that all items loaded on to a single factor (eigenvalue = 3.62, variance explained = 60.39%).

User involvement is measured using a modified version of Franz and Robey's (1986) user involvement scale. Respondents were asked to respond to five statements concerning their perceived influence and degree of involvement in the ABC system design. The PCA resulted in the extraction of only one component with an eigenvalue greater than one representing user involvement (eigenvalue = 3.77, variance explained = 75.36%). ABI training is operationalized based on the respondents' subjective assessment of the adequacy of the training received on selecting and using ABI and their level of preparedness for using ABI. The results of the PCA

revealed that all items loaded on to a single factor (eigenvalue = 3.33, variance explained = 66.59%).

Perceived usefulness refers to the degree to which individuals believe that using ABI will provide relevant information to enable them to improve their task performance and/or enhance job satisfaction (Davis, 1993). Users' perceptions of the usefulness of the ABI with respect to his or her job activities are measured using six items adapted from Davis (1993). The results of the PCA revealed that all items loaded on to a single factor (eigenvalue = 4.71, variance explained = 78.46%). The four items used to measure ABI use were adapted from Rahman and McCosh (1976) and asked respondents to indicate the extent of their use of ABI. A self-reported measure is a relative indicator of actual ABI use and is considered appropriate (Davis, 1993; Igbaria et al., 1997). The results of the PCA revealed that all items loaded on to a single factor (eigenvalue = 2.16, variance explained = 53.89%). User satisfaction with ABI is operationalized using ten questions adapted from Doll and Torkzadeh's (1989) measure of end-user computing satisfaction. The items ask respondents to indicate the extent of their satisfaction with ABI along four dimensions: information content, system accuracy, report format, and timeliness. The results of the PCA revealed that all items loaded onto a single factor (eigenvalue = 6.18, variance explained = 61.83%).⁶

Review of the Cronbach's alpha and composite reliability for all of the variables support the satisfactory internal reliability of each of the measurement scales, except for task complexity. The Cronbach's alpha and composite reliability of all the variables are above the suggested minimum level for evidence of reliability. With respect to task complexity, the Cronbach's alpha of 0.51 and composite reliability of 0.737 are below the suggested minimum level for evidence of reliability but are not sufficiently low to threaten the convergent validity of the variable. Finally, the correlation coefficients, presented in Table I, Panel B, provide evidence of the discriminant validity of the variables. The variables used to measure a dimension have higher intercorrelations as compared to their correlation with items measuring other dimensions (Fornell et al., 1982).

RESULTS

The descriptive statistics reported in Table 1, Panel A indicated that ABI users' tasks, on average, are characterized by a moderate degree of complexity (mean = 2.63). The mean for perceived ease of use of 2.95, respectively, indicate that, overall, ABI users' have somewhat neutral opinions about the level of effort required to use ABI in performing task-related activities. With regards to characteristics of the implementation process, the mean scores suggest that, overall, ABI users had little involvement in the design of the ABC system (e.g., information needs, input/output requirements) (mean = 1.66) and rate the training received and their preparedness for using ABI as less than adequate (mean = 2.30). The means for perceived usefulness (2.81), ABI use (2.19) and user satisfaction (2.69), indicate that, overall, the sampled ABI users have somewhat neutral opinions about the usefulness of ABI in performing task-related activities; do not extensively use ABI; and are generally less often satisfied with the information content, system accuracy, report format and timeliness of ABI.

Pearson correlation coefficients for the research variables are provided in Table I, Panel B. As expected, the measures of user acceptance of ABI are significantly correlated with each other. The perceived usefulness of ABI is significantly and positively related to both ABI use ($r = 0.62$, $p < 0.01$) and user satisfaction ($r = 0.53$, $p < 0.01$). User satisfaction with ABI is also positively

related to the use of the information ($r = 0.75, p < 0.01$). The correlation analysis, as expected, reveal that user acceptance of ABI is significantly positively related to contextual factors. For instance, perceived usefulness of ABI is negatively related to task complexity ($r = -0.24, p < 0.05$) and positively related to perceived ease of use ($r = 0.41, p < 0.01$). The use of ABI is also negatively related to task complexity ($r = -0.19, p < 0.10$), positively related to perceived ease of use ($r = 0.33, p < 0.01$), user involvement ($r = 0.29, p < 0.01$) and the adequacy of ABI training received ($r = 0.26, p < 0.05$). While user satisfaction with ABI is negatively related to task complexity ($r = -0.31, p < 0.01$), it is positively related to perceived ease of use ($r = 0.37, p < 0.01$) and the adequacy of ABI training received ($r = 0.34, p < 0.01$).

Hypotheses (H1-H4) Testing

To test the specified hypotheses (H1 –H4), a series of multiple regression analysis was run using the three measures of ABI acceptance (perceived usefulness, ABI use and user satisfaction) as dependent variables. The overall model is as follows:

$$X_5 \text{ (ABI Acceptance)} = \alpha_o + B_1X_1 \text{ (Task Complexity)} + B_2X_2 \text{ (Perceived Ease of Use)} + B_3X_3 \text{ (User Involvement)} + B_4X_4 \text{ (ABI Training)} + \varepsilon$$

TABLE I
Correlation and Descriptive Statistics
($n = 70$)

Panel A: Descriptive Statistics

Variable	Minimum	Maximum	Mean	Standard Deviation
Task Complexity (TC) ¹	1.33	5.00	2.63	0.86
Perceived Ease of Use (PEU) ²	1.17	4.50	2.95	0.79
User Involvement (INV) ³	1.00	4.60	1.66	0.97
User Training (TRN) ⁴	1.00	4.20	2.30	1.02
Perceived Usefulness (PUF) ⁵	1.00	4.83	2.81	1.02
ABI Use (USE) ⁶	1.00	3.50	2.19	0.74
User Satisfaction (SAT) ⁷	1.00	4.10	2.69	0.95

Panel B: Correlation Matrix (Pearson Coefficients)

	TC	PEU	INV	TRN	PUF	USE	SAT
TC ¹	1.00						
PEU ²	-0.32***	1.00					
INV ³	0.34***	-0.04	1.00				
TRN ⁴	-0.16	0.51***	0.10	1.00			
PUF ⁵	-0.24**	0.41***	0.04	0.07	1.00		
USE ⁶	-0.19*	0.33***	0.29***	0.26**	0.62***	1.00	
SAT ⁷	-0.31***	0.37***	0.13	0.34***	0.53***	0.75***	1.00

*, **, *** Correlation is significant at 0.10, 0.05 and 0.01 level (1-tailed).

¹ 5-point scale ranging from 1 = low complexity to 5 = high complexity.

² 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree.

³ 5-point scale ranging from 1=not at all to 5 = very much.

⁴ 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree used to measure TRN1, TRN2, TRN3. The scale for TRN4 and TRN5 ranges from 1 = no training/unprepared to 5 = adequate training/preparation.

⁵ 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree.

⁶ 5-point scale ranging from 1 = no/low use to 5 = high use.

⁷ 5-point scale ranging from 1 = almost never to 5 = almost always.

The results of the regression analysis are presented in Table II. The tolerance and variance inflation factor (VIF) and the intercorrelations suggest that multicollinearity is not a major problem for the estimation of the regression coefficients. The intercorrelations among the contextual (independent) variables are not significantly high. Task complexity is significantly and negatively correlated with perceived ease of use ($r = -0.32, p < 0.01$) yet positively correlated with user involvement ($r = 0.34, p < 0.01$). Perceived ease of use is significantly positively related to user training ($r = 0.51, p < 0.01$). Examination of the studentized residual (plotted against the predicted values) and partial regression plots suggest that heteroskedasticity and normality are not major problems for the estimation of the regression coefficients. The contextual variables specified in the regression models explain 47 percent (adjusted $R = 0.221$) of the variance in perceived usefulness ($F = 4.614, p = 0.002$); 48 percent (adjusted $R = 0.235$) of the variance in ABI use ($F = 4.982, p = 0.001$); and 47 percent (adjusted $R = 0.224$) of the variance in user satisfaction ($F = 4.685, p = 0.002$), respectively.

The regression coefficients reported in Table II provide support for several determinants of ABI acceptance. The complexity of users job-related tasks is not significantly linked (although the coefficient is negative) to the perceived usefulness of ABI (H1a; $B = -0.20, p = 0.194$). However, as hypothesized in H1b and H1c, task complexity is significantly and negatively linked with reported ABI usage ($B = -0.20, p = 0.089$) and user satisfaction with ABI ($B = -0.28, p = 0.049$). The results support the hypotheses that the ease of using and comprehending ABI is positively and significantly related to favorable perceptions regarding the usefulness of ABI (H2a; $B = 0.60, p = 0.001$); use of ABI (H2b; $B = 0.24, p = 0.054$); and user satisfaction with ABI (H2c; $B = 0.26, p = 0.095$). Although the results do not support the hypothesis that user involvement in the ABC system design will promote favorable perceptions regarding the usefulness of ABI (H3a; $B = 0.14, p = 0.252$), the results do provide support for the hypotheses that user involvement is positively and significantly related to use of ABI (H3b; $B = 0.28, p = 0.003$) and user satisfaction with ABI (H3c; $B = 0.20, p = 0.089$). Finally, the results indicate that the adequacy of ABI training received is not significantly linked to the three ABI acceptance measures; therefore, H4a, H4b, and H4c are not supported.

Fit Hypotheses (H5 and H6)

ABI users' tasks, on average, are characterized by a moderate degree of complexity, as predicted. However, the one-way analysis of variances results presented in Table III reveal significant differences in users' perceptions of ABI, involvement in the ABC system design, and satisfaction with ABI, contrasted by whether they face highly complex or low complex tasks and decision-making activities.⁷ ABI users facing less complex tasks and decision-making activities (mean = 3.36) perceive ABI as being easier to use than users facing more complex task and decision-making activities (mean = 2.60) ($t = 4.08, p = 0.00$).⁸ User involvement in the ABC implementation, in general, was significantly greater for users facing highly complex tasks and decisions (mean = 1.92) than users facing less complex tasks and decisions (mean = 1.38) ($t = 2.122, p = 0.03$). With regards to acceptance of ABI, users facing less complex tasks perceived ABI as being more useful in performing task related activities (means = 3.08) than users facing more complex tasks (means = 2.62) ($t = 1.77, p = 0.08$). Also, on average, users facing less task complexity (mean = 3.09) are significantly more satisfied with ABI ($t = 2.43, p = 0.02$) than users facing high task complexity (mean = 2.54). These results thereby provide partial support for H5.

ABI users, overall, rate the training received and their preparedness for using ABI as less than adequate; however, the comparison of means (Table III) across the adequacy of ABI training categories indicate significant differences. All mean scores of the ease of use and ABI acceptance measures are significantly greater for users who rate the ABI training received as very adequate. Users perceptions regarding the ease of using ABI ($t = 14.68, p = 0.00$) exists in at least one of the categories: not very adequate (mean = 2.41), moderately adequate (mean = 2.81), and very adequate (mean = 3.25). As expected, it appears that users that receive more adequate training on selecting and using relevant ABI are better prepared to use and have more favorable perceptions regarding the ease of using and comprehending the information.

TABLE II
Regression Analysis with Three Indicators of ABI Acceptance and Independent Variables

$$X_5 \text{ (ABI Acceptance)} = \alpha_o + B_1X_1 \text{ (Task Complexity)} + B_2X_2 \text{ (Perceived Ease of Use)} + B_3X_3 \text{ (User Involvement)} + B_4X_4 \text{ (ABI Training)} + \varepsilon$$

Variable		Coefficient (predicted sign)	Estimate	t-value	p	Tolerance	VIF
Panel A: Perceived Usefulness							
Intercept		α_o	1.81	2.67	0.009	-	-
Task Complexity	(H1a)	$B_1 (-)$	-0.20	-1.31	0.194	0.79	1.26
Perceived Ease of Use	(H2a)	$B_2 (+)$	0.61	3.55	0.001	0.68	1.46
User Involvement	(H3a)	$B_3 (+)$	0.14	1.16	0.252	0.86	1.16
User Training	(H4a)	$B_4 (+)$	-0.22	-1.63	0.108	0.73	1.38
$R^2 = 0.47, \text{ Adjusted } R^2 = 0.221, F[4, 65] = 4.614, p = 0.002$							
Panel B: ABI Use							
Intercept		α_o	1.44	2.96	0.004	-	-
Task Complexity	(H1b)	$B_1 (-)$	-0.19	-1.73	0.089	0.79	1.26
Perceived Ease of Use	(H2b)	$B_2 (+)$	0.24	1.96	0.054	0.68	1.46
User Involvement	(H3b)	$B_3 (+)$	0.28	3.10	0.003	0.86	1.16
User Training	(H4b)	$B_4 (+)$	0.02	0.32	0.753	0.73	1.38
$R^2 = 0.48, \text{ Adjusted } R^2 = 0.235, F [4, 65] = 4.982, p = 0.001$							
Panel C: User Satisfaction							
Intercept		α_o	2.00	3.28	0.002	-	-
Task Complexity	(H1c)	$B_1 (-)$	-0.28	-2.01	0.049	0.79	1.26
Perceived Ease of Use	(H2c)	$B_2 (+)$	0.26	1.70	0.095	0.68	1.46
User Involvement	(H3c)	$B_3 (+)$	0.20	1.73	0.089	0.86	1.16
User Training	(H4c)	$B_4 (+)$	0.14	1.67	0.247	0.73	1.38
$R^2 = 0.47, \text{ Adjusted } R^2 = 0.224, F [4, 65] = 4.685, p = 0.002$							

It appears that there are significant differences in user perceptions regarding the usefulness of ABI in performing job-related task activities across ABI training categories ($F = 3.34, p = 0.04$): not very adequate (mean = 3.05), moderately adequate (mean = 2.49), and very adequate (mean = 3.15). With regards to reported ABI use ($F = 3.50, p = 0.04$), it appears that users that receive more adequate training on selecting and using relevant ABI actually use the information to a greater extent than users who ABI training was less adequate: not very adequate (mean = 2.17), moderately adequate (mean = 2.06), and very adequate (mean = 2.57). As compared to users receiving moderate ABI training (mean = 2.81) or very little adequate ABI training (mean =

2.41), overall, users receiving very adequate ABI training (mean = 3.27) on selecting and using relevant ABI are more satisfied with the information. Again, these results support H6.

TABLE III
Analysis of Difference Between Means: Task Complexity and ABI Training

Panel A: Analysis of Differences between Means of ABI Users facing Highly Complex Tasks versus ABI Users facing Low Complex Tasks¹

Variable	High Task Complexity	Low Task Complexity	<i>t</i> Statistic ³	Sig. ⁴
Perceived Ease of Use	2.60	3.36	4.08	0.00
User Involvement	1.92	1.38	2.22	0.03
User Training	2.09	2.45	1.37	0.18
ABI Acceptance:				
Perceived Usefulness	2.62	3.08	1.77	0.08
ABI Use	1.17	2.38	1.13	0.27
User Satisfaction	2.54	3.09	2.43	0.02

Panel B: Analysis of Differences between Means Across Levels of Perceived ABI Training Adequacy²

	Not very Adequate	Moderately Adequate	Very Adequate	<i>F</i>	Sig. ⁴
Perceived Ease of Use	2.41	2.81	3.55	14.68	0.00
Perceived Usefulness	3.05	2.49	3.15	3.34	0.04
ABI Use	2.17	2.06	2.57	3.50	0.04
User Satisfaction	2.33	2.57	3.27	6.69	0.00

¹The mean value of 2.63 is used as the cutoff point for classifying respondents' task structures as either high task complexity (≥ 2.63) or low task complexity (< 2.63).

² Respondents composite scores for the training variable are used to categorize users into three percentile groups (not very adequate, moderately adequate and very adequate) based on their perceptions of the adequacy of the ABI training received. Users with a composite training score below the 33rd percentile, between the 33rd and 67th percentile, and above the 67th percentile are assigned to the not very adequate, moderately adequate, and very adequate categories, respectively.

³ Based on t test of equality of the means for high task uncertainty versus low task uncertainty.

⁴ Considered significant at $p < 0.05$.

DISCUSSION, CONCLUSION AND LIMITATIONS

This study extends the current ABCM literature by examining the link between several contextual variables and three widely accepted measure of ABI acceptance (perceived usefulness, ABI use and user satisfaction). The study's findings suggest that the extent to which individuals use and rely on ABI in making cost reduction and process improvement decisions, as well as, their perceptions and level of overall satisfaction with the information is largely influenced by individual-level contextual factors, such as, task complexity, ease of use and user involvement. The relative associations of the contextual variables with the three ABI acceptance

measures indicate that employees may use different standards to evaluate ABI, as suggested by Anderson and Young's (1999) and suggest that alternative measures of ABC success are distinctly related to certain determinants. Ease of use is significantly associated to all three measures of ABI acceptance, whereas, task complexity and user involvement are only significantly associated with ABI use and user satisfaction. User training is not significantly related to the three measures of ABI acceptance.

The results suggest that the analyzability of users' tasks and decision making activities influences the extent to which individuals use and rely on ABI and their level of satisfaction with the information. Turney (1991) proposed that ABI is more useful than traditional cost management information; however, the findings suggest that user rejection of ABI (i.e., negative perceptions, dissatisfaction with or lack of use) will be greater for employees who face a high level of complexity in their task and decision making activities. The results revealed that compared to users facing less complex tasks and decisions, users that perform more complex tasks and decisions are more likely to believe that ABI does not have any performance benefits, not use ABI, be the least satisfied and the most demanding with regards to the level of effort necessary to comprehend and use ABI. There are several plausible explanations for the inverse relations between task complexity and ABI acceptance. First, when users' task activities are complex and/or highly ambiguous, the comprehension and use of ABI may create (or increase) overload and negative perceptions of the usefulness and ease of using ABI. Second, individuals may spend a considerable amount of time verifying and reconciling ABI with data from traditional systems. (Several ABI users expressed concerns about the accuracy of ABI and the amount of time spent verifying the accuracy of the information.) Third, users may not clearly understand the underlying functionality and benefits of using ABI. Fourth, users may not have received adequate guidance in the use of task-relevant ABI.

The results of this study suggest that level of effort expended to use ABI also plays a critical role in users' initial assessment of the usefulness of the information. The magnitude of the association as compared to the influence of the other contextual variables, suggests, that the ease of using ABI has a strong influence on users beliefs about the performance benefits of using ABI. It appears that unfavorable perceptions regarding the ease of using ABI may reduce the perceived performance benefits of its usage. Creating favorable perceptions regarding the level of effort expended to use ABI also plays a critical role in promoting early ABI use and greater satisfaction with the information. The analysis of the survey responses revealed that the most commonly cited weakness of and reasons for not using ABI are related to the need to validate the data and the level of effort required to comprehend and use ABI. Practitioners must simultaneously focus on developing functional capabilities and output formats that are easy to use while providing relevant information that is reasonably effortless to comprehend.

The results of the study reveal that although involving users in the design of the ABC system may not foster a better understanding of the practical applications and benefits of ABI, user involvement does promote ABI use and greater satisfaction with the information. The aggregate findings, suggest that employees who participated in the design of the ABC system by specifying their information needs were committed to the ABC initiative. However, it is possible that despite user involvement in the design of the ABC system, the actual system may not fit users' needs, provide incremental task relevant information and create unfavorable perceptions of ABI. For instance, employees' involvement in the system design may be limited to mere inclusion or representation, but their suggestions and comments are not considered. Also, user involvement may be limited to a certain aspect of the design process. For example, employees may only

provide input regarding their information needs, but are not involved in the structural aspects of the ABC system design. While, this limited participation may promote “buy in” and voluntary use of the information, users may feel that, as compared to the traditional information, ABI is not useful in performing task and decision-making activities given its limitations. Responses to the survey items indicate that employees did not feel comfortable with the accuracy of the (cost driver) data and are more likely to use traditional cost management information to verify ABI.

Contrary to expectations, the results provide no support for the link between user training and the three measures of ABI acceptance. It is possible that the results in this regard could have been affected by the nature of the ABI training provided by the company. The motivation for H4a, H4b and H4c, assumes that employees were provided with training on the use of the ABC system and online data applications as well as some form of specialized instruction and guidance in the selection and effective use of task-relevant ABI. However, interviews with members of the ABCM development team and the in-depth questionnaire responses revealed that the training provided to the company’s employees related to the education and awareness of the ABC system only and minimal technical assistance provided by ABCM developers on an as needed basis.

From a practical standpoint, the results of this case study emphasizes: (1) that ABI may be better suited for certain individuals and tasks than for others, (2) the importance of designing ABC reports and training programs to accommodate different information needs, and (3) the importance of providing cost driver information that ABC users believe is reasonably reliable, verifiable and useful. Consultants and managers may be better able to identify specific situations most conducive to the application of ABI and the extent to which certain types of ABI will be used most optimally. If properly addressed, these concerns may facilitate early ABI acceptance. There are several notable limitations of the study. The measurement of the adequacy of ABI training received and the possibility that unspecified variables may impact ABI acceptance. The other limitations are consistent with the inherent weaknesses of survey (e.g., demand effects, self-selection bias and halo effect), self-report measure of usage and case study research.

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1 The goal of ABC is to provide improved cost data by using a causal relationship of cost driver to activities to allocate costs. Whereas, ABC, success maybe referred to as the ability of organizational members to actually use ABI to improve decision-making to achieve customer value and increase performance (Player and Keys 1995).

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- 2 Minor modifications are made to the original model annually.
 - 3 The questionnaire was adapted to the Internet and the applicable computer software program based on Dillman (2000) and assistance from representatives of an independent computer technology firm. This independent firm was also responsible for the setup and hosting of the survey on the Internet. The Web survey was constructed with the following features. A message providing a brief explanation of the survey, its format and other pertinent information was included on the first screen of the survey. Second, specific instructions for completing the survey were provided throughout the survey. Third, the survey questions and response choices were presented in a manner consistent with traditional paper surveys. Fourth, respondents were not required to answer a particular question before proceeding to the next question (Dillman 2000). Computer literacy was not a major concern in this study due to the nature of the sampled population. Based on conversations with the company liaison, the sampled employees were fairly sophisticated in regards to computer use (e.g., high rates of computer use).
 - 4 To test for evidence of nonresponse bias, Web survey respondents were divided into three groups according to the order of submission. Comparisons of mean variable scores of the research variables and demographic information for the first and last groups indicate no statistically significant differences exist between these two groups. The results of the examination suggest that there are no significant differences in responses based on order of submission.
 - 5 This approach to measuring task complexity is suitable because task characteristics are not defined in term of individual attributes, such as cognitive style, performance or perceptions. As such, potential confounding effects of task and individual factors are minimized and will not pose a serious threat to construct validity. Furthermore, task descriptions, as compared to evaluative opinions of tasks, will provide for increased predictive and discriminant validity between other variables, particularly cognitive complexity and user satisfaction (Saunders and Courtney 1985).
 - 6 The results of confirmatory factor analysis reported that two components with eigenvalues greater than one were extracted. All ten items measuring user satisfaction with ABI loaded high on the first component; however, only three items have loadings greater than 0.50 on the second component (eigenvalue and percentage of variance explained are 1.36 and 13.59 percent, respectively). The second component is not used in subsequent analyses.
 - 7 The evaluation of mean differences using a series of four separate univariate ANOVA or t tests using 0.10 as the significance levels increases the experiment-wise Type I error rate. Across the four mean comparison tests, the probability of a Type I error lies somewhere between 0.10 percent and 0.34 percent. One could argue that multivariate analyses of variance (MANOVA) would control for the experiment-wise error rate by providing a overall tests of mean difference. However, due to sample size constraints, low inter-correlations among all four dependent variables, the results of one-way ANOVA and t tests are more appropriate than a single MANOVA (Hair et al. 1998). Also, controlling the experiment-wise error rate is not as critical considering the results of the mean comparisons are provided primarily for descriptive analysis, support for the achievement of a heterogeneous sample and have no impact on the results.
 - 8 To compare means differences in terms of the level of task complexity, the sampled ABI users were classified according to their task complexity. Highly complexity tasks are defined as those equating to or exceeding (less than) the overall task complexity mean value of 2.63.

MARKET REACTION TO ADOPTION OF SFAS NO. 131 ON SEGMENT REPORTING

Yousef Jahmani, Savannah State University
jahmaniy@savstate.edu

Alireza Dorrestani, Clay State University
adorestn@memphis.edu

ABSTRACT

The purpose of this paper is to test the information content of Statement of Financial Accounting Standard No. 131, "Disclosures About Segments of an Enterprise and the Related Information." A random sample of one hundred and eleven companies of those listed in *Business Week Global 1000* for the year 1997 was selected. These companies disclosed segment information before 1996 and applied the new standard afterward. Three statistical techniques; a dummy variable, analysis of variance, and contingency table analysis were utilized to test whether the new standard conveys useful information. The results indicate that adoption of the new standard does not statistically convey significant additional information that is relevant to the investors and other users of financial statements. Investors and other users of financial statements have already had access to the information disclosed under SFAS No. 131.

INTRODUCTION

The Financial Accounting Standards Board issued, in 1976, the Statement No. 14, "Financial Reporting for Segments of Business Enterprise." It requires listed companies to disclose segment information by both line of business and geographic area in their annual reports. The lack of precise definition of business segment and lack of consideration of internal organization of the company, as well as the relatively high cost of providing such information, led financial statement users to express great dissatisfaction with the statement. Many, including the Association of Investment Management Research (AMIR 1993), complained that the definition of segment is imprecise and that there are many practical problems in applying this definition. The AMIR also recommended that segment disclosure in annual reports should be based on the internal organization of the company.

The AICPA Special Committee on Financial Reporting (1994) provided similar recommendations and asked standard setting bodies to give the highest priority to this issue. Statement of Financial Accounting Standard (SFAS) No. 14 was subsequently amended by (SFAS) No. 94, "Consolidation of All Majority-Owned Subsidiaries," to remove the special disclosure requirements for previously unconsolidated subsidiaries and later was superseded by SFAS No. 131, "Disclosures About Segments of an Enterprise and the Related Information," but retains the requirement to report information about major customer. The new standard requires that a public business enterprise report financial and descriptive information about its operating segment. SFAS No. 131 adopted a management approach, focusing on the way in which

management organizes segments internally to make operating decisions and to assess performance. The objective of this approach is to facilitate consistency between internal and external reporting. Information may be segmented by product, service, geographic area, customer type, or legal entity. For each operating segment, firms must report segment profit or loss, certain items of revenue and expense, segmental assets and other items. The statement establishes standards for the way that public business enterprises report information about operating segments in annual financial statements and requires that those enterprises report selected information about operating segments in interim financial reports issued to shareholders. The Statement became effective for years beginning after December 1997.

Recent studies by Herrmann and Thomas (2000) and Street et al. (2002) show that, with adoption of the new standard, companies are reporting greater numbers of line of business (LOB) segments, more information about each segment, and there is more improvement in consistency of segment information with other parts of the annual reports. They also show that for company-wide disclosure, the proportion of country-level geographic segment disclosure has increased. The results of these studies reflect only the behavior of the management or suppliers of information. What is missing in previous studies is the analysis of behavior of the other side of the market that is demand side of information. The purpose of this study is to focus on the demand side and test the market reaction to the adoption of the new standard.

LITERATURE REVIEW

Researchers on Statements of Financial Accounting Standard No. 14 and No.131 have examined different aspects of their application in order to evaluate their usefulness. The impact of segment information disclosure on share prices was examined by Horwitz and Kolodny (1977) and Ajinkya (1980). Both of these studies did not find any significant differences in abnormal returns and/or in risk-adjusted returns. Swaminathan (1991), however, using a different methodology, did find pricing effects. Specifically, an increase in share price variability occurred around the first disclosure of segment data along with a decrease in the divergence of analyst forecast following that disclosure. Both of these changes were related to the number of segment disclosed. The evidence on direct security pricing effects of the SEC-mandated data is mixed.

Maines et al. (1997) examined the effect of both industry approach (per SFAS No. 14) and the management approach (per SFAS No. 131) on analyst's judgments and decisions. They found that financial analysts believe segment data are reliable under the SFAS No. 131 approach, where there is greater congruity of internal reporting with external segment reporting. Herrmann and Thomas (2000) surveyed the annual reports of a sample of U.S. multi-segment firms listed in the 1998 *Fortune* 500 to compare the segment reporting disclosure under SFAS No. 131 with those reported the previous year under SFAS No. 14. They found that over two-thirds of the sample firms changed segment definitions upon adoption of the new standard. They show that the application of management approach has resulted in improvements. First, the new standard has increased the number of firms disclosing segment information. Second, companies are disclosing more items for each segment. For enterprise-wide disclosure, the proportion of country-level geographic segment disclosures has increased, while the proportion of broader geographic area segment disclosure has decreased. On the other hand, the number of firms disclosing earnings by geographic segment has declined greatly since the disclosure of this item is no longer required.

Street et al. (2000) assessed the 1997 and 1998 annual reports of a sample of the largest publicly traded U.S. companies to determine whether SFAS No.131 adequately addressed user concerns about segment disclosures and the extent to which the expected benefits set forth in the new standard materialized. The findings suggest that in general the new standard has improved business reporting. The improvement includes the increase in the number of reported segments and significant consistency of segment information in 1998 compared to the year before. However, their findings also suggest that there are yet a few companies that have restructured their segments to avoid reporting additional segment information. Moreover, very few companies continue to report segment information not consistent with the other parts of their annual reports and Management's Discussion and Analysis (MD&A). They also assessed the impact and effectiveness of the new standard with reference to geographic segment disclosures. Their findings show more disclosure of country specific geographic segment data under SFAS 131 as well as more consistency between reportable segment data and other parts of the annual report. However, their research also reveals that the aggregation problem has not been fully resolved. Many companies still provide data based on a highly aggregated basis. Their findings also reveal a lack of voluntary geographic segment disclosures and loss of geographical information about income under SFAS No. 131. In general, the findings of these researchers suggest that there is significant improvement in segment information disclosure.

Berger and Hann (2003) examined the effect of SFAS No. 131 on the information environment. They compared industry-based forecasts of revenue and earnings using SFAS No. 14 data, to forecasts using retroactively disclosed SFAS No. 131 data, in order to measure the new information provided by SFAS no.131 disclosure. Berger and Hann (2003) found that differences in these forecasts are associated with analysts' forecasts and stock prices suggesting that analysts and market participants had access to some of the SFAS No.131 data before it was reported. This is consistent with analysts and market participants relying on private sources of information for these data, in the absence of SFAS No. 131 disclosures.

Venkataraman (2001) argues that although segment information reported under SFAS No. 131 differs from that reported under SFAS No. 14, it is not clear ex ante that the new information is superior, since SFAS No.14 segment information had favorable characteristics. Segment based on products and services (the "industry" approach) is easily understood by investors, and can be compared with industry statistics compiled by government agencies. Unlike SFAS No. 131 segment data, SFAS No. 14 requires that segment data be reported consistent with GAAP. Furthermore, Venkataraman (2001) argues, "based on the analytical literature of Kim and Verrecchia (1991, 1994), that changes in the precision of mandated public disclosures can affect investors' incentives to acquire information. As a result, the effect of SFAS No. 131 adoption on accuracy of analysts' forecasts and on stock prices is an empirical question."

Herrmann and Thomas (2003), and Chen and Zhang (2003) applied a real-options based valuation approach. They developed and tested a model that addressed the incremental value relevance of segment data beyond firm-level accounting data. Their results indicate that segment data, on average, have a material incremental impact on valuation, so ignoring or overlooking such data can cause considerable information loss and valuation error. Moreover, they found that the incremental impact of segment information is significantly different across different firms.

Ettredge et al. (2005) examined the effect of firms' adoption of SFAS no. 131 segment disclosure rules on the stock market ability to predict the firms' earnings. They found that the adoption of the standard increased both the quality and quantity of segment disclosure. The

results provide strong evidence the SFAS No. 131 resulted in an increase in stock price informativeness, both for multi-segment firms and for single—segment firms that became multi-segment. Botosan and Stanford (2005) examined managers' incentives for withholding segment information under SFAS No. 14 and the impact of SFAS No. 14 on analysts' information environment for a sample of firms that previously reported as single-segment firms. They used retroactive disclosure required by SFAS No. 131. The results suggest that the managers of firms forced to initiate segment disclosures under SFAS No. 131 withheld segment information under SFAS No. 14 to protect profits in less competitive industries, not to conceal poor performance as some have alleged. Their results also indicate that the majority of the firms initiating segment disclosures under SFAS No. 131 report segment operations in industries distinct from their firm primary industry. They conclude that the analysts' shift to greater reliance on public information came at a cost in terms of forecast accuracy.

In general, previous studies tested different aspects of segmental reporting required by SFAS No. 131, but very few investigated market reactions to the standard's adoption. The purpose of this paper is to test the impact of application of SFAS 131 on the firm's perceived risk.

SAMPLE SELECTION

Business Week Global 1000 companies was used to identify the U.S. companies. Business Week ranks publicly held companies according to the market capitalization, which is an indicator of size from an investment perspective. Business Week includes 480 U.S.-domiciled companies. Global 1000 companies are likely to have international operations and thus likely to have geographic segments. Hence, a sample drawn from U.S. Global 1000 companies allows for an examination of the impact of SFAS No. 131 on both LOB-based reporting and geographic disclosures provided as enterprise-wide data.

The annual reports for 1997 and 1998 for all U.S. Global 1000 companies were requested. Excluded from the list were those in energy or finance industries (due to SFAS No.131's liberal aggregation criteria for operating segments that operate in similar environments), those that had no segment LOB or geographic disclosure in 1997, those that adopted the SFAS 131 in 1997, and those that were involved in a merger, major acquisition, spin-off, etc.

As indicated by Street, et al, (2000), the last criterion ensures that differences (or lack of differences) identified by the research are primarily a function of the new SFAS No. 131 guidelines as opposed to being driven by changes in the makeup of the companies' operating segments. The researchers reviewed each annual report to identify those companies that disclosed segment data before and after the implementation of SFAS No. 131. Applying the above criteria, as well as dropping those companies that were not listed in the New York Stock Exchange for the period under consideration, the authors identified 111 companies. The previous criterion is necessary to obtain the companies' share prices.

METHODOLOGY

The objective of this paper is to measure the structural change, if any, in beta due to the segmental data disclosure. There are three ways to do that. The first is to use dummy variable technique, the second is to use analysis of variance, and the third is to use contingency table analysis. With respect to the dummy variable, the subject of this inquiry is the single-index market model shown in equation (1).

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it} \quad (1)$$

Where R_{it} denotes the return for the i th firm in the t th week; R_{mt} represents the market return for the t th week, α_i and β_i are the regression intercept and slope, and e_{it} is the unsystematic risk.

Equation (2) is a modified version of the single-index market model shown in equation (1), which is formulated to test the structural change in betas.

$$R_{it} = \alpha_{i1} + \beta_{i1} R_{mt} + \beta_{i2} (D_t R_{mt}) + u_{it} \quad (2)$$

The D_t variable in equation (2) is a binary variable which assumes the value of unity in the period of segmental reporting disclosure and zero elsewhere. The coefficient of the dummy variable $(D_t R_{mt})\beta_{i2}$ measures the differential effect of segmental reporting disclosure on beta β_{i1} for the i th firm. However, over the non-disclosure period, equation (2) reduces to equation (1). If the beta for the i th firm differs over the non-disclosure and disclosure of segmental data, then β_{i2} will be significantly different from zero. T-test was used to test the significance of individual coefficients while F-test was used to test the significance of whole regression. F-test usually is used when there is more than one independent variable. If t-test is significant for individual coefficients while F-test for the whole regression was insignificant, it means that each coefficient was related to different samples. Therefore, it is necessary for F-test to be significant in order to accept or reject a hypothesis.

An alternative test procedure is to use analysis-of covariance (ANCOVA). It involves splitting the time series in question into non-overlapping sub-periods differentiated by some critical event. It is here the date of segment disclosure. The sum of squared residuals obtained by applying separate regressions to sub-period 1 (pre-disclosure) and sub-period 2 (post-disclosure) data are compared against the sum of squared residuals from pooled regression to test whether a statistically significant shift in beta has occurred.

The advantage of a dummy variable is that only a single regression needs to be run. Moreover, (ANCOVA) does not explicitly tell which coefficient (intercept or slope) is different, or whether both are different between the two periods. In addition, since pooling increases the degrees of freedom, it may improve the relative precision of the estimated coefficient. However, in order to validate the results, both techniques will be used to determine if there is any difference or the results of one method support the other's results. Starting with the dummy variable technique:

Thus, equations (1) and (2) and analysis of variance shown above will be used to test for the following null hypotheses:

Null hypothesis:

There is no difference in the firm's perceived risk before and after the implementation of SFAS No. 131. That is

$$H_0 : \beta_1 = \beta_2$$

Where β_1 , and β_2 represent the firm's perceived risk before and after the disclosure of segmental data, respectively.

The third alternative test procedure is to use the Contingency Table. In order to use the significant effect of SFAS No. 131, we can carry out the standard contingency table analysis using the formula,

$$X^2 = \sum \frac{(O_{ij} - \hat{E}_{ij})^2}{\hat{E}_{ij}} \quad (3)$$

where O_{ij} is the observed frequency and $\hat{E}_{ij}$ is the expected frequency in each cell. The computed value follows a Chi-square distribution with $(r-1)(c-1)$ degrees of freedom, r and c being the number of rows and columns, respectively. The null hypothesis for this test is that returns of the companies in the period before implementation of the SFAS No. 131 is independent of their returns after the standard is implemented.

For testing the effect of the new standard, we divide the entire sample period into two sub-periods, the sub-period before implementation of the standard and the sub-period after. Average market returns is used as criteria for determining which companies make high and which make low returns. Those companies that on average make more than market returns are considered as high returns and others as low returns companies.

RESULTS

The decision rule is that if the coefficient of the dummy variable is significant at the .05 level for individual firms in this group, then the null hypothesis, that LOB as a first segmental reporting disclosure has no impact on firm's perceived risks as represented by betas, will be rejected. This means that the application of SFAS No. 131 conveys useful information. A t-test will

TABLE I. DESCRIPTIVE STATISTICS: COEFFICIENT AND T-TEST

Variable	N	Mean	Median	TrMean	StDev	SE
Mean						
Coef.	111	0.00806	-0.00132	-0.00191	0.10153	0.00964
t-test	111	-0.106	-0.180	-0.185	1.149	0.109
Variable	Minimum	Maximum	Q1	Q3		
COEF.	-0.09892	1.04300	-0.00614	0.00284		
T-TEST	-2.160	7.230	-0.850	0.330		

* Critical value is 1.980 at the 155 degrees of freedom.

be used to determine whether beta changes significantly with LOB segmental reporting disclosure.

The results of computed beta together with computed t-test are reported in Table I above. The coefficients mean of the dummy variable is 0.00806 while the mean for t-test is -0.106, which is insignificant at a 95% level of confidence. Therefore, when these companies implemented SFAS

No. 131 share prices did not move to signal the arrival of useful information that means it does not convey any significant information.

Table II shows the results of F-test for the whole regression. The mean for F-test is 10.57, which indicates that the relationship between independent variables and the dependent variable is weak. When the regression is run without the dummy variable, the mean of F-test is significantly higher, 32.78. Probably, this standard reduces the cost of preparing such information and saves time as will.

TABLE II. DESCRIPTIVE STATISTICS: F-TEST FOR THE WHOLE REGRESSION

Variable	N	Mean	Median	TrMean	StDev	SE Mean
F-Test	111	10.57	2.50	8.72	14.17	1.34
Variable	Minimum	Maximum	Q1	Q3		
F-test	0.01	76.90	0.62	17.66		

* Critical value is 3.0 at the 2 and 155 degrees of freedom.

When the ANCOVA is applied, the results will not change. Table 3 shows the results of ANCOVA. The mean for F-test is 0.7843, which is insignificant at the 95% level of confidence.

The results of the contingency table analysis are presented in Table 4. As the table shows, of the 111 companies included in this sample, 43 have high returns and 68 have low returns in sub-period one. In the second sub-period, 34 companies have high returns compared to 77 companies, which have low returns. These patterns indicate that the new standard have not improved companies returns after its implementation.

TABLE III. DESCRIPTIVE STATISTICS OF ANALYSIS OF VARIANCE

Variable	N	Mean	Median	TrMean	StDev	SE Mean
F-TEST	111	0.7843	0.3400	0.6489	1.0312	0.0949
Variable	Minimum	Maximum	Q1	Q3		
F-TEST	0.0000	5.2300	0.0700	1.0275		

* Critical value is 3.0 at the 2 and 155 degrees of freedom.

The critical value of the Chi-square at the five percent level with one degree of freedom is 3.84. Since the value of 2.62 is well within the acceptance region, we cannot reject the null hypothesis of independence. Thus, there is not sufficient evidence to reject the null hypothesis and support the claim that the implementation of SFAS No. 131 affects the companies' returns and conveys useful information.

TABLE IV. RESULTS OF CONTINGENCY TABLE

		<i>AFTER:</i>		
		HIGH RETURN	LOW RETURN	TOTAL
<i>BEFORE:</i>	HIGH RETURN	17 (13.17)	26 (29.83)	43
	LOW RETURN	17 (20.83)	51 (47.17)	68
<i>TOTAL</i>		34	77	114

(Expected counts are printed below observed counts.)

Based on the foregoing results, the hypothesis that there is no difference in the firm's perceived risk before and after the implementation of SFAS No. 131 cannot be rejected. The foregoing results are consistent with the logic of information. It is important to differentiate between two impacts of the usefulness of information. The first is when the role of information is confined only to the reduction of uncertainty surrounding the decision. In this case, the decision is right, but the decision-maker is uncertain. That is because there is insufficient information. The decision-maker at first utilizes the quantitative information given in the annual reports and information from other sources. The role of information (segmental reporting) here is to confirm the previous decision by reducing the spread of probability distribution around the mean, namely reduce uncertainty and to make the decision-maker comfortable with his/her previous decision. In this case, the information is new and useful, but there is no significant reaction in the market to the release of useful information. Its impact can be measured by asking investors and other users of financial statements to assign a probability distribution to their expected return. The difference between the variances prior and after the release of information measures the information usefulness.

The second impact is when the effect of information released extends to induce significant revision in the previous decision. The effect of this kind of information can be captured indirectly by measuring the unusual movement in share prices. Thus, even when the information released is useful, share prices of all companies involved are not expected to be affected. The current results reflect these facts.

Moreover, there are situations in which information has no impact. This could occur when the information disclosed is perceived as useless or redundant. In this case, share prices would not be expected to react to the release of such information.

CONCLUSION

The results of this study indicate that application of SFAS No. 131 does not statistically convey significant additional information that is relevant to the investors and other users of financial statements. Probably, investors and other users of financial statements have already had access to the information disclosed under this standard by different means. Probably, this standard overcomes the drawbacks of the previous one, such as, the lack of precise definition of business segment and lack of consideration of internal organization of the company, as well as, the relatively high cost of providing such information. Since there is no significant useful

information disclosed as the results of this research suggest, the purpose of this standard probably is to reduce the cost of preparing segmental information and to make disclosure easier.

We have used three different statistical techniques in our study to show that our results are robust and independent of the methodology used.

According to the semi strong form of the Efficient Market Hypotheses, the current price of a firm's stock accurately reflects a vast amount of public information about the firm, including new value-relevant information that has just been made public. Assuming this hypothesis is correct, as new information about a firm arrives, the market price of the firm's stocks should immediately change to reflect this information. However, sometimes the stock price does not react to such information because either the information is new, but has no effect on share prices, or the information has an effect on share prices, but the market became aware of and impounded the information before the disclosure. It is possible that the implementation of SFAS No. 131 is of the latter category of information.

It is obvious that FASB (Financial Accounting Standard Board) when issuing SFAS No. 14, focused mainly on financial disclosures that benefit the financial statements' users. It ignored the complexity and the cost of preparing such information. The results of foregoing research {Street et al. (2000), Herrmann and Thomas (2000), Street et al. (2000) indicate that the number of segments disclosed under SFAS No. 131 increased significantly and the number of companies disclosing segments also increased. The results of this research, together with the results of the above research, suggest that FASB should take into consideration not only financial disclosure, but also the cost and the ease of preparing such information.

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CULTURAL VALUES REFLECTED IN U.S. ONLINE BANNER ADVERTISEMENTS

Lin Zhunag, Louisiana State University
linzhuang@yahoo.com

Xigen Li, Southern Illinois University Carbondale
lixigen@siu.edu

ABSTRACT

This study explores dominant cultural values in banner advertisements of the Top 100 U.S. Web Sites. The findings reveal that the dominant cultural values presented in U.S. online banner advertisements reflect the prevailing values of the society and technology features of the Internet. U.S. online banner advertisements exhibit more utilitarian appeal than symbolic appeal. The study also found that type of advertising appeal is associated with product type possessing the corresponding appeal. The results indicate that online banner advertisements reflect a convergence of the typical cultural norms of the American society and the particular features of Internet advertising medium. The dominance of utilitarian appeal in the banner advertisements corresponds to the nature of Internet advertising development. It also fits the American low-context culture, which prefers logical and factual manners to communicate thoughts and actions.

Cultural values in advertising have been studied in a variety of media setting (Cheng, 1997; Tansey, Hyman, & Zinkhan, 1990). Scholars argued that advertising messages convey and reinforce cultural norms (Pollay & Gallagher, 1990). As the communication technology advances, scholars suggest a link between the communication technology and the key features of a culture. As a rapidly growing medium, the Internet provides a platform to connect technology and culture.

The advertisements by AT&T, Sprint, MCI, Volvo, and others on the Hotwired site in 1994 marked the beginning of the Internet advertising (Meeker, 1997). Advertising revenue in the Internet space has been relatively small but growing rapidly. According to eMarketer, U.S. online advertising spending would increase by 20.2% in 2005, reaching \$11.3 billion by year's end, up from \$6 billion in 2002. That means Internet advertising would account for 4% of all U.S. advertising spending during 2005, up from approximately 3.5% in 2004 (Butler, 2005).

The growth of Internet advertising has sparked numerous studies. However, studies have concentrated either on economic roles of online advertising or the efficiency of Internet ads from the advertisers' perspective. Advertising on the Web not only distributes messages about products and services, it also transfers cultures. A review of literature indicates that although a few studies looked at relationship between Internet advertising and culture, few examined the relationship between the dominant cultural values and the specific products and services advertised on the Internet. Other advertising cultural studies used traditional media (TV, newspaper and magazine) as research subjects, and only revealed cultural values reflected through traditional media. From a cultural perspective, whatever messages Internet advertising

conveyed remains a question largely unanswered. This study attempts to explore the cultural content of the online advertising. By applying the traditional cultural value measurements used in previous studies, this study content analyzed the banner ads of the Top 100 U.S. Web Sites.

LITERATURE REVIEW

Linking Advertising to Culture

Scholarly research indicates a subtle connection between advertising and culture. These theoretical and empirical works concerning advertising and culture can be organized into two approaches. The first approach proposes that as a reflection of social fabric, advertising conveys cultural norms. A content analysis of American advertising found that advertising conveys, directly or indirectly, evaluations, norms, and concepts that comprise an ideology of the society (Andren et al., 1978, p113). Cultural attributes are transmitted and assigned meanings through advertising (McCracken, 1986, p.121).

Empirical studies on cross-cultural studies have also yielded evidence that advertising plays a critical role in transmitting cultural norms (Tansey et al., 1990; Hong, et al., 1987; Belk & Pollay, 1985a; Culter & Javalgi, 1992; Cheng & Schweitzer, 1996). For example, Japanese culture was found to orient its advertising toward respect for nature, tradition and elders while the Western spirit of adventurism and conquest guided American advertising to express more challenges to the status quo (Belk and Pollay, 1985a). In examining cultural themes in Brazilian and U.S. auto ads, Tansey et al. (1990) found that urban themes appear more frequently in Brazilian ads than in U.S. ads, while U.S. ads employ more leisure themes than in Brazilian ads. Western cultures endorse communications that are explicit, direct, and unambiguous, while Asian cultures endorse less verbal communication modes (Hall, 1977).

The second approach suggests that advertising has powerful influence on the culture. By identifying advertising as a powerful media institution, scholars argue that advertising alters and even creates cultural values. Advertising is not simply a selling business; it “has joined the charmed circle of institutions which fix the values and standards of society (Pollay, 1983, p.72).” Belk and Pollay (1985b) evaluated the image of life depicted in advertisements in U.S. popular magazines between 1900 and 1980 and found that the themes used in advertising have an effect on the perception of a progressively more luxurious and comfortable lifestyle in that period. Leach (1994) described how American capitalism had produced the culture of commercial aesthetic. The advertising had lured Americans into the pleasure of consumption and indulgence. Advertising as “a vibrant and provocative social discourse” played a determining role in creating the postmodern culture (Gross et al., 1996).

Measuring Cultural Values

Cultural value is a complex and multifaceted construct. The term “value” has been defined as “an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to alternative modes of conduct or end-state of existence (Rokeach, 1968, p. 160).” Cultural differences could be identified by examining culturally generalizable aspects of a value system (Munson & McIntyre, 1979). Hofstede (1984, 34-37) proposed a cultural value system, which is one of the few studies stemming from both theoretical and practical standpoints. Hofstede’s model first initiated the concept of “dimension of culture” and proposed four value dimensions on which societies differ: Individualism (IDV), Power Distance (PDI), Uncertainty

Avoidance (UAI), and Masculinity (MAS). Although Hofstede's model has rarely been applied to advertising research, it established a framework for cultural value studies.

Cultural value is the core of advertising messages. It refers to intangible beliefs, norms, and characteristics that are embedded in advertising appeals (Zhang & Gelb, 1996). Advertising is a particularly "persuasive proponent of a specific value system" (Pollay, 1983, p.72). Among approaches testing advertising culture hypotheses, a specific applicable method for value analysis was missing for a long time. Pollay (1983) developed a measurement scheme to describe the cultural characters of advertising. He recognized that cultural values, norms, and characteristics are integrated into advertising appeals. Constructing a list of 42 ad values, Pollay covered almost all common cultural values in advertising. Exhaustive and comprehensive, Pollay's typology was conventionally applied in later advertising cultural studies.

Albers-Miller and Gelb (1996) coded advertisements in business publications from 11 countries to examine the systematic cultural differences in advertising content. They matched advertising values identified by Pollay (1983) to four cultural dimensions originally defined by Hofstede (1984). Cheng and Schweitzer (1996) conducted a comparative study that looked into cultural values reflected in Chinese and U.S. television commercials. They constructed a list of 30 cultural values, which is primarily derived from Pollay's (1983) typology of the advertising values. With a list of value items derived from Pollay (1983), Meuller (1987), and Cheng and Schweitzer (1996), Zhang and Harwood (2004) analyzed Chinese television commercials and identified 13 dominant value themes. These measurement instruments formed the basis for this study in measuring cultural values in online banner advertisements.

Advertising Appeals and Advertising Evolution

Advertising appeal is the specific approach advertisers use to communicate how their products will satisfy customer needs. Advertising appeals are typically carried in the illustration and headlines of advertisements (Arens & Bovee, 1994). Described as the two most common approaches used in advertising (Snyder & DeBono, 1985), symbolic and utilitarian ad appeals have been examined extensively in the advertising literature. Symbolic appeal holds a creative objective to construct an image of the generalized user of the advertised product and evoke emotions and thinking. Utilitarian appeal highlights the functional features of the product, such as the performance, quality, and price (Johar & Sirgy, 1991).

Researchers related the adoption of utilitarian or symbolic appeal to advertising evolution (Leiss, Kline, & Jhally, 1997; Pollay & Gallagher, 1990; Cheng & Schweitzer, 1996). Advertising evolution refers to the progression of a certain advertising industry. Through a longitudinal content analysis of print ads from Hong Kong, the People's Republic of China and Taiwan, Tse et al. (1989) found that advertising evolves with economic development, moving from functional, utilitarian benefits to more symbolic benefits.

Leiss et al. (1990) identified a historical pattern of advertisement growth in a historical analysis of U.S. advertisements. The pattern indicates a shift from "informational to symbolic presentation" of human values in advertising, as the advertising industry grows "mature." Cheng and Schweitzer (1996) applied Leiss' historical model to their comparative study of Chinese and U.S. television commercials, and found that Chinese television commercials tend to use values with symbolic appeal. They argued that advertising in China has stepped beyond the product information phase described in Leiss et al.'s (1990) model. Zhang and Harwood (2004) found the

dominant value themes in the Chinese advertising indicated the prevalence of values with utilitarian appeal and the coexistence of both traditional and modern values. They argued that the prevalence of values with utilitarian appeal was a reflection of the developing stage of Chinese advertising.

Other Factors Influencing Cultural Values

Although previous studies indicated that cultural values and appeals in advertising are related in a nonrandom way, some scholars have noticed that cultural values may not match advertising appeals in some circumstances. It is especially true when some external factors are weighted to enhance advertising effectiveness. For example, product-related characteristics, such as product use condition, product life cycle, and differentiation, play a key role in determining advertising content. Zhang and Gelb (1996) reported that product use conditions have strong impact on the effectiveness of different advertising appeals across contrasting cultures.

Furthermore, the traditional view of advertising effectiveness suggests that a particular message appeal is contingent on the type of product being advertised. Research in advertising effectiveness has claimed an appeal-by-product interaction. This notion implies that effectiveness of message appeal type is a function of the product type being advertised (Shavitt, 1990; Sewall & Sarel, 1986; Aaker, Batra, & Myers, 1992; Dube et al., 1996). More specifically, Holbrook and O'Shaughnessy (1984) argued that the type of appeal should "match" the type of product. Johar and Sirgy (1991) also summarized the arguments in favor of such a relationship in positing that "value-expressive" (similar to emotional or feeling) appeals work best for value-expressive products, whereas "utilitarian" (similar to rational or thinking) appeals work best for utilitarian products.

Studies on the likely effects of new media technologies upon culture have showed that information technology introduces new types of human interactions and alters the structure of people's interests (Rogers, 1986; Meyrowitz, 1985; Neuman, 1991; Postman, 1993; Turow, 1997). By evaluating advertising activities on the Internet, Turow (1997) claimed that online services emphasize a greater array of lifestyle interests than any other medium. He predicted that Internet database capabilities would reinforce lifestyle segregation and extend the splits in social fabric (Turow, 1997). However, other scholars questioned whether the Internet would create drastic social and cultural changes. Turkle and Brail (as cited in Gersch, 1998) argued the Internet in many ways is merely a reflection of traditional media. The Internet only reproduces the content of existing media, particularly with respect to commercial content.

A large part of the literature on cultural reflections in advertising dealt with the issues in traditional media. Numerous studies focused on the market mechanism of Internet advertising. A few studies looked at the cultural themes of Internet advertising, but few examined how advertising appeal is reflected in Internet advertising and relates to product category. Cultural value is critical in advertising success in traditional media. As a technically advanced medium, does the Internet bring new notions to the existing cultural themes? It is assumed that the cultural value structure of traditional advertising media also exists in Internet advertising and plays an important role in the Internet as in traditional media. The reasoning here is that consumers grow up in a particular culture and become accustomed to that culture's value systems, beliefs and perception processes. Consequently, they respond to advertising messages that are congruent with their culture. Advertising effectiveness will be greatly enhanced if advertisers understand

the culture and tailor the ads to reflect its values (Zhang & Gelb, 1996). The Internet advertising is expected to continue the practice in traditional media to achieve its effectiveness.

This paper intends to test the reasoning about Internet advertising reflecting specific cultural values through a content analysis of the banner advertisements on the Top 100 U.S. Web Sites. The study mainly applied Cheng and Schweitzer's (1996) measurement instrument to identify the cultural values embedded in online banner advertisements. It also looked at how product categories influenced cultural values of Internet advertising. The study will test the following three hypotheses.

H1: The dominant cultural values presented in U.S. online banner advertisements are likely to reflect the prevailing values of the society and technology features of the Internet.

According to the literature, U.S. Internet advertising, like advertising in other media, will reflect cultural values of the American society that creates it. At the same time, Internet advertising is expected to convey some special themes such as "technology" and "information" with respect to its unique communication technology characteristics.

H2: The majority of U.S. online banner advertisements reflect values with utilitarian appeal instead of symbolic appeal.

According to the Leiss et al.'s (1990) historical pattern of advertising evolution, the preference for using values with utilitarian or symbolic appeals reflects the maturity level of consumers. In the highly competitive U.S. market, advertisers have to provide solid information in advertising to attract their target consumers, who are living in a low-context culture and prefer directness in speech (Cheng & Schweitzer, 1996). A low-context culture relies heavily on its Western rhetoric and logic tradition to relate thoughts and actions to people and their environment (Hall & Hall, 1987). The Internet environment also has its unique features. The small amount of space for banner ads on a Web page requires conciseness and brevity. Different from other media users, Internet users are actively looking for information (Sterne, 1997), which may result in that Internet advertising bears more values with utilitarian appeal that consumers could perceive immediately.

H3: Type of advertising appeal is associated with the type of product possessing the corresponding appeal (product categories).

As the literature indicates, product-related characteristics have much to do with advertising appeal. Type of appeal is likely to match the type of product possessing the specific appeal (Holbrook & O'Shaughnessy, 1984). Value-expressive (emotional) and utilitarian appeals will work best for the corresponding products (Johar & Sirgy, 1991). To be effective in promoting the products advertised, Internet advertising is assumed to follow the pattern appeared in the traditional media. This hypothesis would test whether type of advertising appeal in the online banner advertisements is associated with product-related characteristics, in this case, product categories possessing the corresponding appeal.

This study will also answer the following research question:

RQ1. To what degree are cultural values of online banner advertisements associated with advertising appeal?

This research question attempts to confirm the relationship between cultural values and advertising appeal. “Economy,” “convenience,” and “effectiveness” were considered typical cultural values with utilitarian appeal, whereas “enjoyment” was considered typical cultural values with symbolic appeal in the studies of traditional media. The answer to this question will clarify to what degree cultural values match advertising appeal in the Internet setting.

METHOD

This study employed a content analysis. Content analysis is frequently used at various levels to examine variables as words, themes, characters, items, and space-and-time measures (Kassarjian, 1977). There are three types of Internet advertising: keyword search (analogous to paid search), banner ads, and online classified. The banner ad is the most prevalent method of Internet advertisement and generates the largest ad revenue (Interactive Advertising Bureau, 2003). Using interactive techniques, banner ads represent dynamic contents for Internet cultural studies.

Sampling

This study used a nonrandom sample by selecting banner ads from the Top 100 U.S. Web Sites. The Top 100 Web Sites were the most popular Web sites in the United States at the time when this study was conducted. The ranking of the Top 100 Web Sites was provided by the monthly Internet Ratings report from PC DataOnline, one of three leading companies that specialize in ranking Web site popularity. Web site popularity was ranked by the unduplicated audience reach and the number of unique visitors. These Web sites were also online ad publishers, which listed the CPM (cost of per thousand impressions) for their ad space, along with the prices for products like buttons or keywords, all tailored to the particular vehicle that a site might provide (Meeker, 1997).

Banner ads on Web sites “decay” or are updated very quickly. The time frame for banner ads update varies across the Web sites. Some sites change every five seconds, others update their ads at a much slower pace. Through an observation of the 10 Web sites out of the Top 100 one month before data collection, it was found in five minutes, the numbers of unduplicated banner ads appeared at the 10 Web sites ranged from zero to 12. Five minutes at one site was considered a functional time frame to obtain a sufficient number of banner ads for this study. Five minutes at each site would probably generate 300 unduplicated ads from the 100 Web sites. The sampling process lasted 10 days, from May 19, 2003 to May 28, 2003. All banner ads on the home page or the front page of the Top 100 U.S. Web Sites were collected. A total of 268 banner ads were downloaded.

Key Concepts and Operational Definitions

Banner Ad refers to a typically rectangular graphic element that displays brief information of a product or service, and entices the viewer to click it for further information. Using eye-catching designs and logos, banner ads usually run on the top and bottom of Web pages to generate traffic and create brand awareness. A banner ad usually includes some text, such as a phrase or a slogan and the advertiser’s name and Internet address. If a user finds the ad intriguing enough, he or she

may then click on the ad, which activates an embedded link, to visit the advertiser's Web site (Sterne, 1997).

Cultural value is defined as intangible beliefs, norms, and characteristics that are embedded in advertising appeals (Zhang and Gelb, 1996). The measurement of cultural value in this study is largely based on Cheng and Schweitzer's (1996) measurement instrument. Cheng and Schweitzer's study applied Pollay's 42 cultural value typology, a comprehensive and exhaustive measurement instrument of cultural values. The instrument has been frequently applied in advertising cultural studies to identify cultural values of advertising messages. Because some of the values do not apply to the Internet medium, this study measured cultural value using 32 items. Most of them were adapted from Cheng and Schweitzer's study.

Advertising appeal is divided into two groups: symbolic appeal and utilitarian appeal. *Symbolic appeal* evokes a wide range of emotional responses from the ad's audience. The cultural values with symbolic appeal include those suggesting human emotions such as "enjoyment," "individualism," and "social status." *Utilitarian appeal* involves informing consumers of one or more key benefits that are perceived to be highly functional or beneficial to the target consumers. Cultural values with utilitarian appeal emphasizes product features or qualities, such as "convenience," "economy," and "effectiveness."

Product Category. The products or services advertised in Internet banner ads are divided into 16 categories. The product categories of Cheng and Schweitzer's (1996) study were modified to create a list of products for this study by adding Internet-related categories such as online shopping and online community/service.

The unit of analysis is one banner ad on the homepage or the front-page of each Web site. A homepage is the initial page of a Web site. It provides information both directly and via links to other files on the same site or to files on computers located on remote networks. A front-page is similar to the concept of the print version, and usually appears as a section on the homepage (Li, 1998). The data were collected mostly from homepages. Some Web sites may not post ads on their homepage. If there was a link to front page, then front page was used to collect the data. If no front page was linked, the first left link on the home page was chosen to collect banner ads. The page initiated from the first left link was a page similar to the front-page, and its prior position is likely to attract more attention than pages from less noticeable links on the homepage.

Data coding and analysis

Two coders participated in the coding. The coders were first trained according to the coding protocol and learned the operational definitions of variables and the procedures to code the banner ads. A subsample of 40 banner ads was used to test intercoder reliability. Scott's (1955) *pi* formula was used to calculate intercoder reliability. The Intercoder agreement averaged 87.7%, which is higher than the 85% standard for content analysis (Kassarjian, 1977).

The frequencies of cultural values and product categories were recorded. Using the coding scheme adapted from Cheng and Schweitzer, the 32 cultural values were further divided into two advertising appeal groups: symbolic and utilitarian. By following the coding protocol, the coders identified the most dominant value in each ad based on the key elements of banner ads, accompanied by online animated elements, background audio or captions.

Two statistic procedures were used in this study: frequency distribution and cross-tabulation. The frequency distribution was used to identify the most dominant cultural values presented in the banner ads. The cross-tabulation and the Chi-square test were used to determine the relationship between cultural values and advertising appeal, and product category and advertising appeal.

FINDINGS

Hypothesis 1, that the dominant cultural values presented in U.S. online banner advertisements are likely to reflect the prevailing values of the society and technology features of the Internet, was supported. The analysis of the data revealed six most dominant values, which consisted of nearly three fourth (72.7%) of the 32 value items. They were “economy” (25.7%), “effectiveness” (12.3%), “incentive” (11.2%), “enjoyment” (10.1%), “informative” (6.7%), and “convenience” (6.7%). Of the six dominant values, “economy,” “effectiveness,” “incentive,” and “enjoyment” were the prevailing values similar to those found in the traditional media. “Informative” and “convenience” were associated more with the business and technology features of the Internet. (Table I)

The four dominant product categories were “business and finance” (17.6%), “computer and Internet product” (16.0%), “online community/service” (14.6%), and “Entertainment” (9.4%). Two of the categories were Internet specific, which comprised nearly one third (30.6%) of the 16 product categories.

Hypothesis 2, that the majority of U.S. online banner advertisements reflect values with utilitarian appeal instead of symbolic appeal, was supported. About three fourths (74.6%) banner ads reflected values with utilitarian appeal, whereas 25.4% banner ads displayed values with symbolic appeal. Among the 16 product categories examined, six categories were dominated by cultural values with utilitarian appeal whereas only two categories were more symbolic-centered percentage wise. “Online service/community” ads reflected values with utilitarian appeal such as “informative” and “economy;” “computer and Internet products” ads demonstrated utilitarian values such as “effectiveness” and “economy;” and “business and finance” ads featured utilitarian values such as “economy.” Meanwhile, “entertainment” ads reflected more values with symbolic appeal such as “enjoyment.” (Table II)

The findings also supported hypothesis 3 that type of advertising appeal is associated with the type of products possessing the corresponding appeal (product categories) ($X^2 = 38.47$, $df = 15$, $p < .01$). Advertising appeal was more likely to be associated with the product categories that possess the characteristics of the type of advertising appeal. The Chi-square test showed a statistical significance in the relationship between type of advertising appeal, utilitarian or symbolic appeals, and the product category (type of product or service). For example, the value “economy,” the dominant value with utilitarian appeal, was more frequently used in “business and finance” (27.5%), “computer and Internet product” (14.5%), and “online community/service” (17.4 %). “Effectiveness,” the second dominant value with utilitarian appeal, occurred most frequently in “computer and Internet products” (30.3%). “Incentive,” the third dominant utilitarian values, was more frequently used in “business and finance” (13.3%), and “computer and Internet product” (13.3%). “Enjoyment,” the dominant value with symbolic appeal occurred most frequently in “entertainment” (37%). However, exception was also found in the value with utilitarian appeal, such as “incentive” in “entertainment” (26.7%), which possesses more characteristics of symbolic appeal than utilitarian appeal. (Table II)

**TABLE I. CULTURE VALUES IN BANNER ADS PRESENTED
BY THE TOP 100 U.S. WEB SITES**

Cultural Value	Symbolic		Utilitarian		Total	
	Freq	%	Freq	%	Freq	%
Adventure	1.0	0.4	2.0	0.7	3	1.1
Beauty	1.0	0.4	0.0	0.0	1	0.4
Collectivism	3.0	1.1	0.0	0.0	3	1.1
Competition	5.0	1.9	1.0	0.4	6	2.2
Convenience	1.0	0.4	17.0	6.3	18	6.7
Economy	0.0	0.0	69.0	25.7	69	25.7
Effectiveness	0.0	0.0	33.0	12.3	33	12.3
Enjoyment	27.0	10.1	0.0	0.0	27	10.1
Family	3.0	1.1	0.0	0.0	3	1.1
Health	0.0	0.0	5.0	1.9	5	1.9
Incentive	0.0	0.0	30.0	11.2	30	11.2
Informative	0.0	0.0	18.0	6.7	18	6.7
Modernity	5.0	1.9	0.0	0.0	5	1.9
Patriotism	1.0	0.4	1.0	0.4	2	0.7
Popularity	4.0	1.5	1.0	0.4	5	1.9
Quality	2.0	0.7	8.0	3.0	10	3.7
Safety	0.0	0.0	2.0	0.7	2	0.7
Sex	0.0	0.0	1.0	0.4	1	0.4
Social Status	1.0	0.4	0.0	0.0	1	0.4
Technology	0.0	0.0	9.0	3.4	9	3.4
Tradition	5.0	1.9	0.0	0.0	5	1.9
Uniqueness	1.0	0.4	0.0	0.0	1	0.4
Wisdom	5.0	1.9	0.0	0.0	5	1.9
Others	3	1.1	3	1.1	6	2.2
Total	60	25.4	200	74.6	268	100

$\chi^2 = 236.25, df = 26, p < .01$

**TABLE II. ADVERTISING APPEAL BY PRODUCT CATEGORIES
ON THE TOP 100 U.S. WEB SITES**

Product Categories	Symbolic		Utilitarian		Total	
	Freq	%	Freq	%	Freq	%
Automotive	5	1.9	1	0.4	6	2.3
Business and Finance	8	3.0	39	14.6	47	17.6
Publishing and Media	0	0.0	3	1.1	3	1.1
Travel	4	1.5	22	8.2	26	9.7
Health	3	1.1	12	4.5	15	5.6
Entertainment	13	4.9	13	4.9	25	9.8
Telecomm	2	0.7	6	2.2	8	2.9
Computer and Internet products	6	2.2	37	13.8	43	16
Online shopping	2	0.7	13	4.9	15	5.6
Food	5	1.9	3	1.1	8	3
Beauty and Personal care	3	1.1	3	1.1	6	2.2
Apparel	1	0.4	3	1.1	4	1.5
Household Appliance	1	0.4	5	1.9	6	2.3
Gifts	0	0.0	2	0.7	2	0.7
Online Community/Service	9	3.4	30	11.2	39	14.6
Miscellaneous	6	2.2	8	3.0	14	5.2
Total	68	25.4	200	74.6	268	100

$X^2 = 38.47$, $df = 15$, $p < .01$.

This study also provided the answer to the Research Question 1: To what degree are cultural values of online banner advertisements associated with advertising appeal?

The results showed a relationship between type of cultural value and advertising appeal ($X^2 = 236.25$, $df = 26$, $p < .01$). The Crosstab analysis revealed that several cultural values were closely linked to the specific advertising appeal. “Economy” (25.7%), “effectiveness” (12.3%), “incentive” (11.2%), and “informative” (6.7%) only appeared in the banner ads with utilitarian appeal. “Collectivism” (1.1%), “enjoyment” (10.1), “modernity” (1.9%), and “wisdom” (1.9%) only appeared in the banner ads with symbolic appeal. While other cultural values may appear in banner ads with both utilitarian and symbolic appeals, “convenience” (6.3% vs. 0.4%) was more likely to be associated with utilitarian appeal, whereas “competition” (0.4% vs. 1.9%) was more likely to be associated with symbolic appeal. (See table I)

DISCUSSION

This study explored dominant cultural values in U.S. Internet banner advertising. The Results suggest that U.S. online banner advertisements tend to reflect six cultural values: “economy,” “effectiveness,” “incentive,” “convenience,” “informative,” and “enjoyment.” Of the six values, “economy,” “effectiveness,” and “convenience” are typical utilitarian cultural values (Cheng & Schweitzer, 1996). The results showed a heavy repetition of utilitarian appeal that promote practical attributes such as inexpensive, cost saving, powerful, and easy to use.

The United States is regarded as typical of the Western culture (Belk et al., 1985). The value profile of the six dominant values in this study indicates that online advertising in many ways conveys cultural norms of the Western societies. Like in traditional media, U.S. online advertisers have tailored ads to reflect the prevalent cultural perceptions of the Western societies, such as “enjoyment” and “incentive.” Meanwhile, the particular characteristics of the Internet medium in some way have influenced Internet advertisers’ preference of cultural values such as “informative.”

The findings are consistent with Cheng and Schweitzer’s (1996) television advertising study on dominant cultural values in advertising. Their explanation for the dominance of the cultural values with utilitarian appeal is that there is a partial shift from symbolic values back to utilitarian values in advertising and the shift might be caused by the maturity of U.S. consumers. By looking closely at how advertising works on the Internet, this study found that the dominance of utilitarian values was more likely due to online advertising environment and the technology features of the Internet.

According to Leiss et al.’s (1990) historical pattern, the level of advertising maturity has impact on symbolism and utilitarianism of ads value. The pattern suggests that the less the advertising maturity, the greater the likelihood of using utilitarian appeal. Despite its rapid growth, online advertising is still in the process of getting mature. In this relatively new realm, advertising strategies are constantly changing, adapting, and developing with the advancement of technology. Therefore, the frequent use of values with utilitarian appeal such as “economy,” “effectiveness,” and “incentive” reflects the fact that Internet advertising is still in the process of evolution.

The dominance of the three values with utilitarian appeal also fits the unique characteristics of the online advertising environment. Television watchers or magazine readers might digest ads in a mood of relaxation. The mood is different when it comes to surfing the Internet. Online users browse Web pages and links so quickly that many of them seldom give a second glance to ads. Therefore, messages in banner ads have to be direct and enticing instead of being symbolic and subtle (Cho, 2003). Banner ads containing “economy,” “convenience,” or “effectiveness” are usually clear, straightforward, and compelling.

A comparison of low-context culture to high-context culture is also useful in explaining the high percentages of values with utilitarian appeal in this study. A “high-context culture” requires symbols and icons rather than logical recommendations to communicate thoughts and actions. Within a high-context culture, specific comparative or logically based appeals may not be desirable (Lin, 1993, p.40). For example, advertisements in Japan, which is regarded as a “high-context society,” reveal an indulgence in sensitive crafting of product image and appearance and lag in the mentioning of product price, warranty, safety, because stating price or other utilitarian

attributes is considered too direct or even rude (Lin, 1993). In contrast, the United States is regarded as a “low-context culture,” which relies heavily on its Western rhetoric and logic tradition to relate thoughts and actions to people and their environment (Hall & Hall, 1987). Therefore, advertisements in the United States were presented in a more factual and logical manner. This pattern of presenting facts and attributes to show product superiority reflects American indigenous cultural norms (Lin, 1993). For the same reason, the low-context culture of the United States orients its Internet banner ads to show more utilitarian values that emphasize product attributes and quality.

The consumer's level of involvement in online settings might be another reason to explain the predominance of values with utilitarian appeal in the online advertising (Cho, 2003). Consumers are flooded with information and squeezed for time and they are unwilling to spend too much time on advertising with their own specific direction for information searching (Sterne, 1997). Marketing researchers also argue that banner ads are so prevalent that they are in danger of being ignored (Notess, 1999). Since the banner ads are usually at the top or bottom position on a page, it is easy for Web users to ignore the banner. In order to survive from the fierce market competition, Internet advertising must provide solid information to its savvy online users, who prefer conciseness and lucidity. Symbolic values evoke human emotions, which are often intangible in a quick glimpse. It is not surprising that utilitarian values, which convey more tangible and straightforward information, would be favored in online ads strategies.

The dominance of the value “enjoyment” is consistent with hedonism, the origin of consumer culture in the West. Hedonism is a key feature of consumer culture, and results in an endless and ultimately unfulfilling quest for novelty, primarily through consumption. Hedonistic consumption values involve fun, gratification (e.g., an exciting life), and pleasure (Campbell, 1987). In seeking economic productivity, Western advertising has nourished an indulgence of consumption and the good life. Consumers in the United States are inclined to value benefits (e.g., luxury, prestige, enjoyment) beyond the product's basic functions (Leach, 1994). The high percentage of “enjoyment” values in online banner advertisement reflects the American society's consumption characteristics.

Johar and Sirgy (1991) found that value-expressive (symbolic) advertising appeal is effective when the product is value-expressive (symbolic), while utilitarian appeal is effective when the product is utilitarian. In their view, when values match rooted cultural characteristics of products or service, ads are more likely to elicit positive responses from their audience. The result of hypothesis 3 yielded evidence consistent with previous studies with regard to relationship between advertising appeal and product category. Cultural value varies greatly from ad category to category, but the type of advertising appeal works more effectively with the product categories possessing the corresponding appeal.

Although overall the percentage of the values of the product categories exhibits a consistent pattern as Johar and Sirgy's (1991) found in their study, part of the findings of this study suggests something different. For example, the value with the highest percentage in the “business and finance” was “competition” (16.7%), which is not a utilitarian value but a symbolic value. Also, the most frequently found value in “entertainment” was “Incentive” (26.7%), which is not a symbolic value but a utilitarian value. As Johar and Sirgy (1991) pointed out, the pattern is moderated by a variety of factors including product-related characteristics such as product life cycle, scarcity, and differentiation or consumer-related factors such as consumer involvement, prior knowledge and self-monitoring. In other words, under some situations, advertising

utilitarian/symbolic appeals may not match the product's utilitarian or symbolic characteristics. Johar and Sirgy's view on pattern moderation offers some explanations for the unexpected high percentages of unmatched advertising appeal in some product categories in this study.

This study has several limitations. It included only banner ads from the Top 100 Web Sites in the United States. Thus, the results could not be generalized beyond this context. Another limitation is the adaptation of Cheng's cultural value scheme. Cheng's measurement instruments were developed for television advertising and did not fully apply to Internet advertising. Seven out of the 32 value items did not appear in the banner ads. The high missing rate of values suggests a further revision of the measurement scheme is needed for future studies.

Future studies in cultural value of online advertising could be improved by 1) selecting a random sample from a broader range of Web sites; (2) sampling ads of other categories such as online classifieds and directory listings; and (3) revising the value measurement to make it more suitable for online advertising analysis. Also, further research might expand this study by examining the relationships between cultural values and external aspects other than product categories, such as Web site categories, country origins or reliance on consumer involvement.

CONCLUSION

This study found six dominant cultural values reflected in U.S. online advertising. This value profile showed a convergence of the typical culture of the American society and the particular features of Internet advertising environment. Online banner advertisements reflected more cultural values with utilitarian appeal than symbolic appeal. This finding adds empirical evidence to Leiss' (1990) advertising historical pattern and corresponds to the nature of online advertising development, which requires conciseness and brevity. The preference for utilitarian values reflects the American low-context cultural environment, which prefers logical and factual manners to communicate thoughts and actions.

The utilitarian and symbolic appeals reflected in the online banner advertisements were found to be related to product category. This finding conforms to the traditional advertising effectiveness theory. It suggests that when Internet advertisers choose utilitarian or symbolic appeals for their ads, the particular characteristics of product or service have been considered to make the ads more effective.

Advertising effectiveness relies partly on the degree to which the ads reflect the culture and its specific values. Advertising on the Internet, although different in format and delivery channel, strives for success by transforming cultural norms as the traditional media. However, the findings of this study question the notion that the Internet in many ways is merely a reflection of traditional media, and the Internet only reproduces the content of existing media. What set Internet advertising apart from advertising in traditional media are the dominance of utilitarian appeals, reflection of proper cultural values through the specific product, and the reliance on technology and consumer involvement, all of which call for further investigation. Simple reproduction of the content of existing media is in no way of leading to effectiveness of Internet advertising.

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DETERMINANTS OF FRANCHISING: THE CASE OF SPAIN

Rosa M^a Mariz-Pérez, University of A Coruna, Spain.
rmariz@udc.es

Rafael M^a García-Rodríguez, University of A Coruna, Spain.
rgarcia@udc.es

M^a Teresa García-Álvarez, University of A Coruna, Spain.
mtgarcia@udc.es

ABSTRACT

In this paper, we analyze the evolution and pattern of ownership in Spanish-franchised chains, and we study some of the key factors or characteristics that can determine—from an organizational view—the proportion of franchised units. First, we represent how the percentage of franchised units varies with time for the 316 chains included in the sample. In order to detect existing differences, we have also divided chains into two basic groups—service and product chains. Second, taking into account data for 2003, we try to identify the key variables that significantly determine the propensity to franchise using ordinary least squares (OLS).

The paper is structured as follows. After a brief introduction, the description and meaning of the different variables used is explained. The third part of the paper is related to the data collection phase and, lastly, we refer to the basic conclusions and possible future extensions.

INTRODUCTION

The existing literature has employed different theoretical perspectives to justify the existence of franchising. Specifically, agency- and resource-based theories have been applied to explain why, in some cases, the franchisor chooses to invest directly in a new outlet of the chain while, in others, decides to franchise it. The existing franchising literature includes numerous papers that have focused on this problem, although, in most cases, data is drawn for the U. S. or the U. K. situation. Therefore, the present study intends to discover if these results can be basically applied to the case of Spain or, alternatively, if the Spanish franchising sector presents relevant differences with respect to other more developed markets.

In this sense, many empirical studies have established that franchised units are efficiently superior to franchisor-owned outlets. This may be due to the fact that franchising enables increased chain growth, while it reduces monitoring costs, especially when units are located in a disperse manner. Geographic dispersion increases, in this sense, difficulties and costs associated with control of managers of franchisor-owned stores (Brickley, Dark, & Weisback, 1991; Jensen & Meckling, 1976; Norton, 1988; Shane, 1996, 1998). More specifically, franchising increases unit performance through the allocation of ownership and control rights

to the same person, the franchisee, and this reduces adverse selection and moral hazard problems (Shane, 1996, 1998; Carney & Gedajlovic, 1991; Blair & Lafontaine, 2005).

Because franchisees are the owners of the units they manage and, therefore, receive the residual rent generated by their outlets, once they have made royalty and other periodical payments to the franchisor, they have strong incentives to be efficient. Compared to this, managers of outlets owned by the chain have weaker incentives because they basically receive a fixed pay (Krueger, 1991) that does not depend on their store efficiency or profit (Rubin, 1978; Brickley & Dark, 1987). Even if compensation includes some type of variable pay, its relative importance is low because chains find that the opposite situation would compromise uniformity through reduction of quality standards (Bradach, 1998; Yin & Zajac, 2004). Therefore, for employees of franchisor-owned units, the reward for being efficient is, essentially, based on the possibility of future hierarchical promotion.

Related to this, monitoring and incentives are seen as substitutes. In this sense, franchised units are subject to less control from central offices and their managers have powerful incentives. This makes them more sensitive to local market needs and conditions, and it enhances profitability and efficiency as major objectives. Lower control over franchisees is evident if we observe that they enjoy wide-ranging powers to make certain decisions, which entails high autonomy. For example, many new actions or promotions are only optional for franchisees. Compared to this, managers of franchisor-owned outlets that usually put into practice decisions adopted centrally by the owner of the chain. Therefore, persuasions, recommendations, and suggestions made to franchisees substitute hierarchy and obligations for employees of franchisor-owned units.

Greater autonomy of franchised outlets is also observed through the greater number of these that are attributed to each area supervisor for monitoring compared to the number of franchisor-owned outlets (Bradach, 1998) or the lower information requirements they are subject to.

Another stream of the franchising literature, far from establishing the superiority of one of these alternative forms of government, has highlighted that the presence of both type of units in the same chain gives rise to relevant synergetic effects (Bradach & Eccles, 1989; Lewin, 1997; Bradach, 1998; Dant et. al., 1996; Lafontaine & Kaufmann, 1994; Pénard et. al., 2003; Yin & Zajac, 2004; Sorenson & Sorensen, 2001). Specifically, franchisor-owned stores are most useful in maintaining and developing brand name quality and homogeneity, exploiting certain economies of scale—for example, those associated with acquisitions from suppliers, providing less opaque information compared to franchisees, etc. On the other hand, franchisees are best in supplying the chain with new ideas and adaptations to local markets. Therefore, the so-called “plural form” or “dual form” is an efficient solution to mitigate asymmetrical information, limited rationality, and incomplete contractual hazards.

Based on the above, the franchising decision will not represent a transitional strategy that will disappear with time. In this sense, franchisors do not choose to grow through franchised units as a minor temporarily evil to overcome certain resource restraints (Oxenfeldt & Kelly, 1969; Caves & Murphy, 1976; Norton, 1988; Lafontaine & Kaufmann, 1994). Ultimately, total integration is not the aim because, as we have mentioned, synergetic benefits arise from the simultaneous presence of both type of outlets.

However, many studies have found that as chains reach maturity, they open less franchised units and, therefore, choose to grow, in greater extent, through franchisor-owned establishments (Oxenfeldt & Kelly, 1968-1969; Rubin, 1978; Caves & Murphy, 1976; Ozanne & Hunt, 1971). Time and chain age enable franchisors to acquire the necessary resources—financial, local market knowledge and management talent—to undergo new unit opening directly.

With the objective of understanding the growth pattern of franchised chains, we have chosen to represent it graphically. For this purpose, we analyze the evolution in Spain of the proportion of franchised units as the age of the chain increases. We find that this percentage increases more in the first years and becomes more or less stable after five years since the first franchised outlet was opened. These results are comparable to those obtained by Lafontaine & Shaw (2005) or Pénard et. al. (2002).

After observing the evolution of chain composition, we try to answer the question as to why some chains grow through more franchised units and others employ, almost exclusively, franchisor-owned outlets. To shed some light over this, our intention is to discover which variables have a significant influence over the proportion of franchised establishments. For this purpose, a multiple regression model is developed.

VARIABLES

After plotting the pattern for the evolution of outlet ownership, we conduct an OLS regression using SPSS 11.5. The dependent variable—proportion of franchised outlets—is modeled as the natural log of the ratio of the percentage of franchised units with respect to the percentage of company-owned outlets. This transformation has been used in many other empirical studies (see, for example, Shane, 1998, or Michael, 1996) and Berry (1994) demonstrated, through a series of Montecarlo experiments, that it constituted a more robust and precise measure of the distribution compared to the simple percentage variable both for OLS and Tobit regressions.

The independent variables include the basic contractual conditions employed by the chain to regulate the relation with franchisees along with other chain characteristics. A brief description of independent variables and the expected influence over the proportion of franchised units is provided below.

SECTOR.

It is equal to one when the chain is basically dedicated to the distribution of products and equal to zero when its object consists in the commercialization of services.

We expect to find that service activities have higher percentages of franchised outlets (Sen, 1998; Lal, 1990). This is because in this type of chains, local production has greater relevance and, therefore, tasks to be done at each outlet are, on the whole, more labour-intensive. This type of activities are subject to greater relax and opportunism; thus, given that franchisees have high-powered incentives, it will be more efficient to grow through a higher proportion of franchised units. On the other hand, when activities to be done locally have a significantly lower importance—in the case of product distribution chains—local agent effort is less important and we should find chains with higher integration percentages.

Related to the above, service chains face greater supervision difficulties or monitoring costs. This causes that franchisors will choose to substitute behaviour control with output control through more franchised units.

Given the above, service chains should present higher proportions of franchised outlets.

AGE.

This variable represents the number of years since the franchisor opened the first unit. Therefore, it is the difference, in years, between 2003 and the year the firm was established.

It is quite evident that, in general, the longer this period is, the greater the proportion of franchised units will be. This is not only due to the simple fact that time just goes by. *AGE* has been used as a proxy for franchisor experience (Weaven & Frazer, 2003), brand name value, or reputation (González-Díaz & López, 2003; Affuso, 2002; Lafontaine, 1992), and for franchisor accumulated resources (Alon & McKee, 1999; Carney & Gedajlovic, 1991; Combs & Ketchen, 1999). This way, given that the number of potential franchisees willing to join the chain increases as chain perceived value does, we expect to find a positive relation over the proportion of franchised units.

YNOTF.

It represents the number of years the chain initially remained without franchising any outlets at all. Therefore, it is the difference, in years, between the year the chain was established—this is, the first franchised outlet was opened—and the year the firm was created—the first year the franchisor was in business—.

We expect *YNOTF* to have a negative influence over the proportion of franchised units because this period of time can reflect, in a certain manner, franchisor difficulties to adequately design and develop the complete franchise package (González-Díaz & López, 2003). Moreover, during that period the franchisor has installed a totally centralized organizational form, and it can result difficult for him to let in quasi-independent businessmen that will make their own decisions.

INTERN.

This independent variable will be equal to one when the chain has some sort of international presence and equal to zero when it has outlets only in the domestic Spanish market.

If the franchisor has chosen to expand activities overseas, we should find a higher proportion of franchised units because, in most cases, he will not have the sufficient local market knowledge to undertake unit opening by himself. Local franchisees will have much better and complete information about demand conditions, governmental procedures, etc. Moreover, they have powerful incentives to keep it up to date.

Therefore, we expect to find that chains with international presence present higher values for the proportion of franchised outlets.

SIZE.

In order to measure the size of the chain, we have chosen to use the total number of outlets of the chain—franchised and franchisor-owned. Chain size has been used, in many occasions, as a proxy for geographical dispersion and, in this sense, for monitoring difficulties (Agrawal & Lal, 1995; Minkler, 1992; Brickley, Dark & Weisbach 1991; Lafontaine, 1995; Kehoe, 1996; Hoffman & Preble, 2001). So, geographical distance affecting the new outlet would make monitoring difficult. This problem would become even more outstanding if expansion is done through franchisor-owned units. However, if the decision is to franchise the new outlet, monitoring needs are reduced; thus, franchising reduces control costs when moral hazards exist (Brickley, Dark & Weisbach, 1991; Lafontaine, 1992).

From another point of view, chain size has also been used as a proxy for brand name value. In this sense, greater chain size will increase the number of potential consumers attracted and served (Lafontaine, 1992). This will convince franchisees, in greater extent, to join the chain.

Given the above, chain size is likely to favor franchising and, therefore, it should have a positive influence over the percentage of franchised units.

ININVEST.

The initial investment is the amount, in euros, the franchisee must invest in his outlet to join the chain. However, we have not taken into account here the initial lump sum entry fee paid to the franchisor; this amount is included in variable *FIXED PAYM*.

Therefore, *ININVEST* reflects the amount the franchisee must invest to adequately lay out and decorate his premises. If the resource scarcity hypothesis for franchising is true, this variable would have a positive influence over the dependent variable. However, it must be taken into account that higher investments increase franchisee' risk and, this may reduce available franchisees. This would mean that *ININVEST* would have a negative influence over the proportion of franchised units.

Related to this, it is observed that outlets located in large urban cities—bigger units and that, therefore, entail higher associated investments—are usually franchisor-owned (Hunt, 1973; Thompson, 1992). Maybe this is because the existence of various outlets in the same city reduces monitoring costs and performs as benchmarks. On the other hand, in isolated areas, where only one unit usually exists, ownership is assigned to franchisee because free-riding—one of the basic franchising hazards—is reduced due to the existence of repeating-type customers. In this sense, negative consequences of reducing quality would mainly correspond to the opportunistic agent (Brickley, Dark & Weisback, 1991). This has a certain relation with another dependent variable included in the analysis: *POPUL*.

Results reported by Brickley (1999) are also inconsistent with the general statement that franchising is used to overcome franchisor resource restraints. He finds that the probability of direct investment of the franchisor increases with amount needed. It seems that greater initial investments increase risk and demanded profitability for franchisees, and this reduces advantages of franchising and limits franchisee' availability. Therefore, we expect a negative influence over the dependent variable.

TOTAL VAR.

To calculate the value of this variable, we have added the percentages of royalties and advertising fees for each chain. When these stipulated payments were not established as a percentage of sales, but through a fixed sum, they were not included here—they were taken into account in *FIXED PAYM.*

Royalty rates contribute to the alignment of both parties interest because both franchisee and franchisor will be interested in increasing sales. Because royalty payments are usually associated to sales, the franchisor signals his intention of undergoing the necessary investments to maintain and increase brand name value and to detect opportunistic behaviors that reduce chain sales. The franchisee is always interested in increasing his sales because his profit is linked to the former.

High royalty payments would serve as a powerful incentive to franchisors to control or monitor activities in order to increase brand name value but would reduce franchisee motivation to be efficient. Moreover, the number of potential franchisees willing to join the chain will be reduced and, from another point of view, part of the advantages associated to franchising will disappear—economic conditions would be closer to that of franchisor-owned units. Therefore, a negative relation is likely to exist between this variable and the proportion of franchised units.

DUR.

Longer contractual duration contributes, from a transaction costs view, to reduce advantages of hierarchy compared to that of the market. Transaction costs associated to this last option will be reduced and, as an intermediate case, the same will occur in the case of franchising.

Besides, longer contractual duration also reduces agency costs for various reasons (Shane, 1998). First, the franchisor has more powerful incentives to collect information on suitable potential franchisees and, in this manner, lower adverse selection hazards (Eisenhardt, 1989). Second, the possibility of moral hazard is reduced because informational problems disappear with time. Lastly, the agent has mayor incentives to be diligent and to reduce opportunism because the relative importance of short-term profits obtained as a consequence of opportunistic behavior is diminished.

Franchise contracts usually fix a determined initial duration for the relation between parties or establish that it will be unlimited. In the first case, possible renovations are contemplated; thus, the franchisee can consider his investment as long-termed. This acts as a stimulus for him to try to discover his customer tastes and characteristics in order to recover the undergone investment (Bradach, 1998).

Based on the above, we expect contract duration to have a positive influence over the dependent variable.

SURFACE.

This variable expresses the minimum surface, measured in square meters, fixed by the franchisor in order to allow for the opening of a new unit of the chain. Therefore, to some

extent, it can reflect effort required from the franchisee and, in this manner, reduce the number of potential franchisees willing to join the chain.

The expected negative relation between *SURFACE* and the dependent variable can also be due to the fact mentioned above that the franchisor is usually the owner of the larger outlets located in big cities, while the franchisee is left with the smaller more disperse units.

POPUL.

This variable reflects the minimum population fixed by central offices in order to allow for the opening of a new outlet of the chain. We already referred to the high probability of large units to be owned by the franchisor. Smaller units located in little villages or towns—where only one outlet of the chain usually exists—are more commonly franchised. Therefore, the minimum population fixed by the franchisor to open a new store in a given location should have a negative influence over the dependent variable.

FIXED PAYM.

The value of the last independent variable is the sum of the necessary initial lump sum entry fee and the actual or present value of fixed periodical payments—essentially royalties and advertising fees when they are not determined as a percentage of sales.

This variable is also positively related to franchisee effort. Therefore, we expect to find a negative influence over the proportion of franchised units.

However, initial entry fee compensates the franchisor for selection and initial training costs while the remaining periodical payments are justified as being remuneration for brand value and on-going support (Lafontaine, 1992; Lafontaine & Shaw, 1999). It is for this reason that we may find a positive relation between *FIXED PAYM* and the proportion of franchised units, given that the latter may be willing to make larger payments in exchange for greater support and intangible resource transfer from the franchisor.

DATA

Due to the non existence of a ready-to-use database related to franchising in Spain, data employed has been collected—in collaboration with a working group at the University of Oviedo (Spain) coordinated by Prof. Manuel González and Prof. Begoña López—from the four annual franchise guidebooks published for the period 1997-2003.

First, to represent the evolution pattern of ownership for Spanish indigenous chains, the proportion of franchised units was calculated as the quotient between the number of franchised outlets in Spain and the total number of outlets the chain has in Spain. This was done for each chain and for each year from 1997 to 2003. However, from more than 1300 existing Spanish-franchised chains found, only around 500 fulfilled the necessary condition of having started to franchise in 1997 or before, and continue to do so in 2003. Moreover, it was only possible to collect sufficient data for 316 of these; this was the size of the final sample employed.

Likewise, the time, in years the chain had been franchising, was calculated as the difference between the year the data was observed (1997, 1998...) and the year the chain was

established. To the value obtained, we added one because, in some cases, we had an incongruent situation in which the chain had been franchising for zero years and, despite this, did have franchised units. This did not seem correct.

Given the impossibility of graphically representing data directly, we divided chains into groups according to the number of years franchising. For each group, we calculated the average value of the proportion of franchised outlets and this was what was finally represented. Additionally, we also divided the sample into two groups according to chain activity—service or product—and repeated the above process again for each one.

Related to data collection, we must refer to important incongruent information. In this sense, in some cases, for the same year and variable, guidebooks contained very different values. To give solution to this problem, we contacted the franchisor, on the telephone or via its Web page, with the aim of reflecting the true value of the variable. Nevertheless, when this was not possible, we chose to take the value proportioned by the Spanish Association of Franchisors because this guidebook had resulted, on other occasions, in the most accurate data.

Once the data collection from annual guidebooks for period 1997-2003 is concluded, we are now merged in completing this information with financial and economic data taken from Annual Accounts (profits, advertising costs, sales, etc.).

Second, for OLS regression, we introduce the key variables described in the previous section. In some cases, data for some variables was available in interval terms. In these cases, franchisors reported a maximum and minimum because exact numerical value depended on other circumstances like unit location or dimension; thus, we introduced the average of the variable. This analysis was conducted for data corresponding to year 2003.

RESULTS

First, we represented the evolution of the proportion of franchised outlets for Spanish indigenous chains in our sample for period 1997-2003. For this aim, data was calculated and regrouped as explained above.

FIGURE I shows that the dependent variable increases with respect to the number of years the chain has been franchising. After five years, this value is stabilized round a value of 74%—alternatively, the proportion of franchisor-owned outlets reaches 26%. In the first years, franchising is used in a much more intensive manner—it must be taken into account that we are representing the evolution of the dependent variable with respect to the number of years franchising. However, chains usually initially remain some years without franchising; during this time period, all units are franchisor-owned. These results are consisted with that of López et. al. (2000); the only differences are that here stabilization takes place a little earlier and the percentage of franchised units is slightly lower.

Because we expected to detect different ownership evolution patterns with respect to the type of activity, chains were divided into two groups, namely, service and product chains.

FIGURE I: THE EVOLUTION OF THE PROPORTION OF FRANCHISED UNITS FOR SPANISH CHAINS (1997-2003).

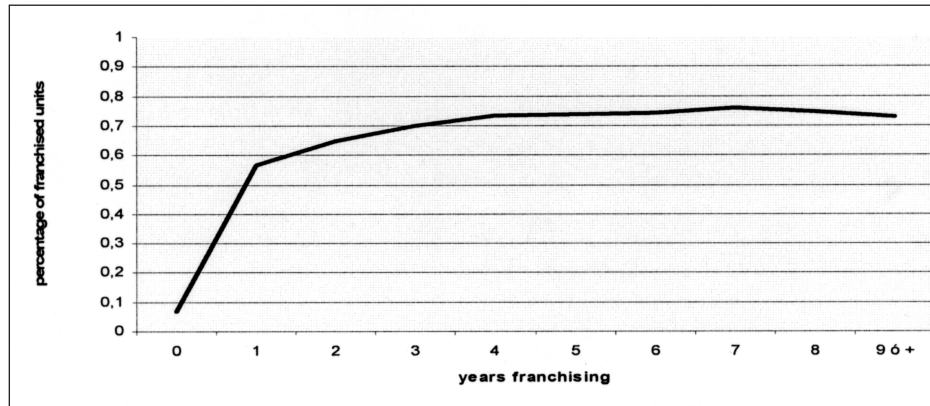
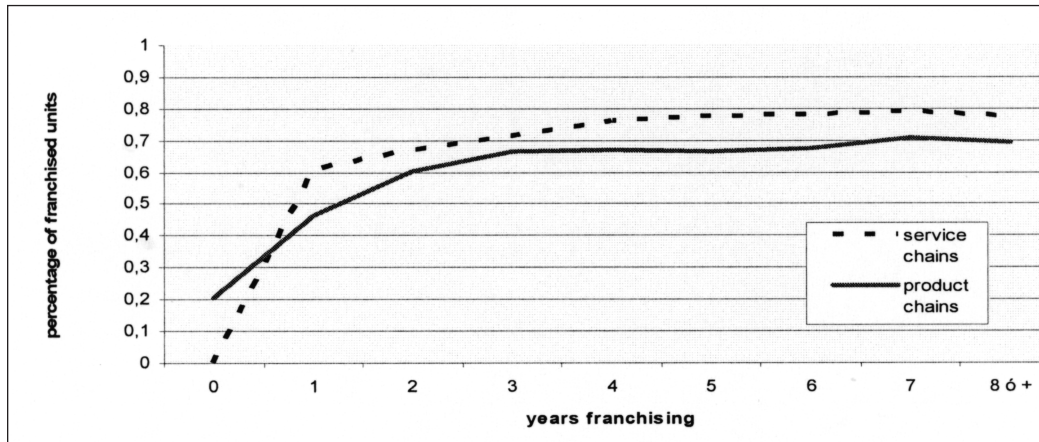


FIGURE II shows that service chains, at average, present a higher proportion of franchised outlets compared to product distribution chains. This is in line with results obtained by Pénard et. al. (2002) and Lafontaine & Shaw (2005), although the percentage of units franchised is slighter higher in our case—nearly 80% for service chains and 70% for product chains. Nevertheless, these results are fairly similar to that obtained by research applied to more franchise developed countries—U.S. or U.K.; the main difference is that in Spain the franchising activity has only been generalized after the late nineties.

FIGURE II: THE EVOLUTION OF THE PROPORTION OF FRANCHISED UNITS FOR SPANISH SERVICE AND PRODUCT DISTRIBUTION CHAINS (1997-2003).



In order to detect additional differences between chains according to their activity, we considered, based on the classification provided by annual franchise guidebooks, various sector of activities. In this sense, we divided the sample of chains into eight sectors, four of the service type and another four for product distribution. However, results are not displayed

because we did not find relevant differences given that all four groups of chains of each type presented comparable evolution patterns.

Several tests were performed in order to determine the convenience of conducting the OLS analysis. First, the correlation matrix between the different independent variables shows small values; thus, multicollinearity problems are reduced. Second, normality distribution of the sample was checked through the K-S and S-W tests; both Sig-values were higher than 0.05; thus, the null hypothesis of normality cannot be rejected.

Next, **TABLE I** displays OLS regression results. The dependent variable measures the proportion of franchised units of chains. Within the independent variables, *SECTOR*, *AGE*, *YNOTF*, *INTERN*, *SIZE*, and *POPUL* are found to have a significant influence over the proportion of franchised outlets. All of the former present the expected signs.

Therefore, we can say that service chains choose to franchise a higher proportion of outlets. This seems to confirm that when necessary local activities are of more relevance and more labor-intensive, the given incentive system makes franchising the best organizational option.

Second, chains that have been in business for a longer time (*AGE*) tend to present larger proportions of franchised establishments. It is obvious that, as time since the franchisor opened the first outlet of the firm goes by, the greater the value of the dependent variable. Moreover, this effect can also be due to increased franchisor experience and brand name value as chain age is longer; this would surely have a positive influence over the number of franchisees willing to join the chain.

The number of years the chain initially remained without franchising at all (*YNOTF*) has a significant negative influence over the proportion of franchised units. Therefore, as the number of initial years during which all outlets are franchisor-owned and no franchised units are opened increases, franchisors seem to be reluctant to let franchisees in. They get used to a centralized organizational form where central offices make all decisions and this situation reduces future franchising activity.

Another significant independent variable is the presence of chain outlets in foreign markets; *INTERN* has a positive influence over the dependent variable. This means that when the chain has outlets abroad, it chooses to grow, more intensively, through franchised units. Geographical dispersion and reduced franchisor local market knowledge reduces the proportion of franchisor-owned units.

SIZE, measured as the total number of chain units, has a significant positive relation over the percentage of franchised outlets. Therefore, larger chains exhibit a higher proportion of the latter, probably because these chains are subject to increased geographical dispersion.

The quantity of initial investment (*ININVEST*) needed to adapt store premises to franchisor requirements reduces the proportion of franchised outlets of chains. Franchisee risk aversion and the impossibility for these to diversify investment adequately seem to reduce the number of potential franchisees willing to join the chain. We do not, therefore, find any empirical evidence to prove that franchising exists due to resource restraints of franchisors. The franchisor directly invests in the opening of new outlets when the necessary investment is higher.

The last significant independent variable to explain the proportion of franchised units is the minimum population fixed by the franchisor as the necessary minimum in order to open a new outlet in a given city or town (POPUL). It has a negative relation over the dependent variable; thus, we can say that the franchisor tends to be the direct owner of units located in the larger cities, while outlets situated in smaller towns are chosen to be franchised.

The remaining variables included in the analysis—the total royalty and advertising percentages, the initial contractual duration, the minimum surface of the outlet and the amount of the fixed payment—do not help to explain, in a statistically significant manner, variations in the proportion of franchised units. However, the signs displayed by the first three of these are as expected. On the contrary, the amount of the fixed payments the franchisee must make presents a positive relation; this seems to indicate that larger periodical fixed payments do not reduce franchisee interest to join the chain. Maybe, this is because they are willing to pay more in exchange for greater intangible resource transfer and support from franchisor.

TABLE I: REGRESSION RESULTS (N=316).

Independent variables (R-squared = 0,39)		Standardized Coefficients Beta
(Constant)	2,338	
SECTOR		-,214 (***)
AGE		,059 (*)
YNOTF		-,109 (**)
INTERN		,106 (**)
SIZE		,336 (***)
ININVEST		-,062 (*)
TOTAL VAR.		-,042
DUR		,071
SURFACE		-,038
POPUL		-,092 (*)
FIXED PAYM		,020

(*) Significant at 0.1.

(**) Significant at 0.05.

(***) Significant at 0.01.

CONCLUDING REMARKS

In this paper, our key aim was to determine some of the basic characteristics and contractual conditions that have a significant influence over the proportion of franchised units in Spanish chains. Results are much in line with those obtained by other researches and other more developed countries. Therefore, although in Spain franchising is a much more recent

organizational form, ownership structure of chains is similar to that of other geographical areas. Results indicate that the ownership pattern for Spanish chains does not differ from that obtained for other countries in which franchising is a much more widespread activity. The basic difference is that, in Spain, this process started up in the late nineties.

We have conducted an OLS multiple regression using data for Spanish indigenous chains published in annual franchise guidebooks for year 2003. Results suggest that chain sector, age, number of years initially not franchising, the presence of outlets overseas, size, required initial investment and minimum population help to explain, in a significant manner, variations in the dependent variable. Therefore, chains that exhibit a higher proportion of franchised outlets are those that are dedicated to the commercialization of services, have been in business for a longer period, have stayed initially a smaller number of years without franchising at all, have decided to internationalize activities in some extent, entail lower initial investments, and fix lower minimum populations to allow for a new unit to open. The remaining independent variables result nonsignificant.

Service chains decide to use franchising more intensively in order to overcome monitoring difficulties. Services entail increased relevance of local labor-intensive activities that, evidently, are subject to greater risk of opportunistic behavior.

The age of the chain or the number of years in business has a positive influence over the percentage of franchised units. This variable is commonly used as a proxy for brand name value or reputation, franchisor experience and for chain accumulated resources and it is obvious that, as the perceived value of the chain increases, so will the number of potential franchisees willing to join.

The number of years the chain has initially remained without franchising exhibits a negative relation over the dependent variable. The longer this time period, the higher the franchisors difficulties to conclude the franchising package and the deeper rooting of totally centralized decision making.

If the chain has units abroad, the propensity to franchise is greater. Expansion towards other countries favors franchising in order to have sufficient local market knowledge.

The size of the chain, measured though the total number of outlets, has a positive influence over the dependent variable. This variable is commonly used as a proxy for geographical dispersion and monitoring difficulties that favor the use of franchised outlets.

The amount of the initial investment the franchisee must undergo in order to join the chain, has a negative influence over the proportion of franchised units. Higher investments reduce franchisee interest in joining the chain because high risk cannot be easily spread. The franchisor can diversify his investments and, in this sense, commonly reduce risk. Both effects work towards reducing the use of franchised outlets.

The last relevant independent variable is the minimum population fixed by central offices to allow unit opening. This minimum population has a negative influence over the dependent variable; thus, smaller locations favor the use of franchising, while in larger cities the presence of franchisor-owned units is more common. This is because free-riding hazards related to franchising are diminished if the local agent does not have other chain stores nearby; the opportunistic agent must suffer the consequences of opportunistic behavior.

This constitutes a preliminary study and, therefore, it is subject to limitations. These include, for example, the low value obtained for Square-R. Even though it is in line with that found in most franchising research, we are convinced that other relevant variables have not been taken into account. Therefore, our intention is to continue working on this in the future.

Another limitation comes from the use of aggregate data at the chain level. A more fine-grained analysis should use outlet-level data within firms to explain why a given outlet is franchised or company-owned. At the moment, this type of information is not available in Spain.

Moreover, we are convinced that deeper sector differences between chains must exist. Therefore, we are working on increasing the size of the sample with the objective of introducing several service and product activities.

Lastly, we must point out that, given that this is a preliminary analysis, we have chosen to employ OLS regression. However, given that relations between variables are quite surely not lineal, it would be convenient to study the use of other types of analysis and control variables. Specifically, our intention is to develop a Systems Dynamics Model to explain chain growth and variable interdependencies with the incorporation of financial data.

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DIFFERENCES IN INFLATION'S IMPACT UPON PRODUCTIVITY GROWTH ACROSS INFLATION REGIMES: THE GERMAN CASE

David B. Yerger, Indiana University of Pennsylvania
yerger@iup.edu

Donald G. Freeman, Sam Houston State University
freeman@shsu.edu

ABSTRACT

This paper tests for Threshold Effects in inflation's impact upon German productivity growth. We find differences in the impact of inflation upon German productivity growth depending upon the inflationary regime. No statistically significant impact from an inflation shock upon productivity growth is found if at the time of the shock inflation was in its "low" inflationary regime. If, however, inflation was in its "high" regime at the time of the inflationary shock, then the inflationary shock is found to have a significant negative impact upon productivity growth. This result is contrary to the existing literature examining inflation-productivity linkages for Germany, which fails to find any statistically significant impact from inflation upon productivity growth for the modern German era. The previous literature, however, did not allow for the possibility of a differential impact from inflation depending upon the initial level of inflation itself as in this work.

INTRODUCTION

One of the widespread macroeconomic policy success stories for industrialized nations in the 1980's and 1990's was the reduction of inflation rates from double to low single digits. The relatively low inflation rate environment of the past several years, however, has not eliminated all calls for further reductions in average inflation rates in the industrialized economies. There has remained in some quarters the call for further inflation reductions, perhaps even to zero, with the expectation of improved economic growth and productivity as a consequence of even further reductions in inflation. This paper examines for Germany whether there is empirical support for the position that reducing already low inflation rates further will lead to increased labor productivity growth and thereby increased overall economic growth. Germany has had one of the lowest average rates of inflation in the world over the past 40 years, so it is a prime candidate for investigating the productivity benefits, if any, from further inflation reductions.

There are a number of arguments in the literature for why high rates of inflation reduce economic growth and productivity growth:

- 1) Even fully anticipated inflation acts as a tax on money balances and causes agents to incur shoe-leather and menu costs.
- 2) Unanticipated inflation biases the tax system against capital assets by understating true depreciation costs. Since the bias increases with time, both the level and composition of capital are likely to be affected, with short-lived assets more heavily favored.

- 3) Unanticipated inflation tends to generate price uncertainty, distorting relative price signals and increasing decision-making errors.
- 4) Uncertainty about prices can induce firms to increase inventories of buffer stocks and reduce expenditures on long-term basic research (Feldstein, 1982; Fischer, 1986; Briault, 1995, Thornton, 1996).

While it is quite plausible that adverse inflationary effects would arise through these channels at high rates of inflation, it is much less certain that inflation in the low single digits adversely impacts productivity growth in a meaningful way. In addition, the above adverse inflationary effects may be muted at very low inflation rates by the possible benefit of inflation as “grease” in labor markets. If downward nominal wage rigidity is widespread, then small rates of inflation may aid in the real wage adjustments needed to facilitate the movement of labor out of contracting sectors of the economy and into growth sectors.

Previous empirical work on this issue imposed linear relationships in the testing for inflation-productivity linkages (see Smyth, 1995; Freeman & Yerger, 1997; Freeman & Yerger, 2000). After accounting for the impact of business cycle effects upon measured productivity, these papers fail to find an adverse impact from inflation upon measured productivity growth for Germany. This paper extends the previous literature by testing for the existence of “Threshold Effects” from inflation upon measured productivity growth. If the impact of inflation upon productivity growth varies depending upon the initial level of inflation itself, then it is possible that the absence of findings in the prior literature was due to estimation techniques that forced the same relationship across the “high” versus “low” inflation regimes.

We find that threshold effects are in fact present. No statistically significant impact from inflation upon productivity growth is found when inflation is in the low inflation regime at the time of an inflation shock. An adverse impact from an inflation shock, however, is found when the economy is in the high inflation regime at the time of the shock. The threshold critical value separating the low from high inflation regimes is found to be approximately 3.0%.

LITERATURE REVIEW

Prior to the early 1980’s, research on inflation and productivity growth assumed the relationship to be unidirectional from exogenous productivity growth to inflation. The sharp decline in productivity growth in industrialized nations in the 1970’s, and the coincident rise in inflation rates, caused investigators to more closely examine the causality issue. The theoretical rationales noted above for potentially adverse effects from inflation upon productivity served as the motivation for a series of causality studies. Clark (1982) and Ram (1984) found that inflation negatively granger-caused productivity growth in the U.S. while Jarret and Selody (1982) found the same effect for Canada. The productivity measures used in these studies were a highly aggregated index of output per hour of labor.

Follow-up studies appeared to confirm these earlier findings. Simios and Triantis (1988) analyzed U.S. data through 1986 while Saunders and Biswas (1990) examined U.K. manufacturing productivity through 1985, with both studies finding a significant negative impact from inflation upon productivity growth. Smyth (1995a, 1995b) analyzed both German and U.S. multifactor productivity data and found a significant negative effect from contemporaneous inflation.

The conclusions to be drawn from these studies are limited, however, by several factors. First, these studies for the most part include only the run-up of inflation through the early 1980's and not the subsequent decline. Given the widespread extent of the productivity slowdown across the industrialized world in the 1970's, it would be surprising not to find a negative association between inflation and productivity growth over this time period. A much better causality testing sample period would include both the rise and fall of the inflation spike of the latter 1970's and early 1980's. Another shortcoming of these studies was that most of the papers failed to control for potentially relevant business cycle effects, including the possible endogeneity of contemporaneous inflation and the impact of variations in aggregate demand growth upon measured productivity. A final limitation of these studies was their failure to test for stationarity of the data. Since stationary variables are necessary for valid causality testing, this is a relevant omission.

Several papers have addressed some or all of the above issues, and the findings call into question the conclusions of the prior literature. These studies do not find consistent evidence of a negative impact from inflation upon productivity growth. Sbordone and Kuttner (1994) examine U.S. labor productivity and find that any observed correlation between inflation and labor productivity is due to cyclical comovements rather than to any causal link. Cameron, et al (1996,) test for the existence of a cointegrating relationship between the relevant aggregate price index and productivity series for Canada, Germany, U.K., and U.S. They fail to reject the null hypothesis of no cointegration between inflation and productivity, and interpret their results as not supporting a link between inflation movements and productivity movements for these nations. Freeman and Yerger (1997, 1998) include cyclical variables in their analysis to control for the possible endogeneity of contemporaneous inflation in a reexamination of Smyth's (1995a, 1995b) U.S. and German data. With the business cycle proxies in the model, they find no statistically significant impact from inflation upon productivity growth for either the U.S. or Germany. Freeman and Yerger (2000) test the hypothesis that inflation has a causal impact in the granger sense on labor productivity growth in manufacturing for 12 OECD nations. They find that when controls for cyclical effects are included, there is no evidence of a consistent relationship between inflation and productivity growth with regard to either sign or magnitude.

While these more recent time series studies fail to find any robust relationship between inflation and productivity growth, it remains possible that such a relationship exists but only after inflation increases past a certain threshold. Certainly some evidence consistent with this view exists in the literature utilizing cross-sectional tests of inflation-productivity linkages. In early studies, Fisher (1993) and Bruno (1995) both find that high inflation, approximately 2% per month or greater, has adverse consequences on economic growth when examining a cross section of industrialized and developing nations.

Subsequent cross sectional studies examining inflation and economic growth have estimated a wide range of threshold critical values. Sarel (1996) finds a structural break at approximately an 8% inflation rate, below which no adverse effect from inflation on growth is discernable but above which there is a negative impact from inflation. Ghosh and Phillips (1998) find a similar threshold, but at the much lower critical value of a 2.5% inflation rate. Confining their examination to transition economies, Christoffersen and Doyle (1998) estimate the threshold critical value to be a 13% inflation rate. Bruno and Easterly (1998) claim that negative relationships between inflation and growth are found only in cross-country regressions with high frequency data and very high inflation rate outliers. They find no negative relationship between inflation and growth for inflation rates below approximately 40%. Khan and Senhadji

(2000) estimate that the inflation threshold effects upon economic growth is at around 1% inflation rate for industrial economies and 11% inflation rate for developing countries.

These cross-sectional results on threshold effects for the inflation-economic growth relationship suggest at least two conclusions for the present study. First, it does seem to be the case that inflationary threshold effects are likely to exist for a number of the industrialized and developing nations. The wide range of estimated threshold critical values, however, leads to a second conclusion. Namely, that the actual inflationary threshold critical values probably vary, sometimes significantly, across nations given the wide range of estimated critical values generated from studies using different country samples and estimation techniques. Given the many differences across nations in their tax systems, labor market rigidities, and inflation histories, the second conclusion is not surprising. The greater the variation in these factors across nations, the greater the likelihood of variation across nations in the point at which inflation moves from being relatively benign to measurably productivity reducing.

Rather than impose the same inflationary threshold value across multiple nations as in a panel setting, this paper returns to a time series analysis of a single nation, Germany, but modifies the estimation technique to allow for the existence of threshold effects. While the results here cannot be generalized to other nations, the approach used could be replicated on other industrialized nations and the consistency of the findings compared.

DATA

This study uses quarterly data for Germany from 1962 Q1 to 1998 Q4 provided by the Central Bank of Germany. The end date allows the German data to include only the former West Germany and does not include reunified German data statistics in the latter quarters of the sample period, thereby eliminating a structural break in the data unrelated to the inflation regime itself. Also, by ending the sample period prior to the replacement of the German currency by the Euro, another potential source of noise in estimating Germany's inflation-productivity growth linkage is eliminated. Germany was selected for analysis because its average rate of inflation over this period was among the lowest of all industrialized nations. If an adverse impact from inflation upon productivity growth is found for Germany, then it becomes more probable that similar effects exist for higher average inflation industrialized nations.

All variables are expressed as annual growth rates, computed as log first differences, on a year-over-year quarterly basis (e.g. the growth rate of variable X in period t , $dX_t = \log X_t - \log X_{t-4}$) so the data available for estimation begins with 1963 Q1. Inflation is computed as the growth rate in the CPI and the computed productivity growth rate is based on the growth in real output per worker in the manufacturing and mining sector. To control for potential spurious correlation between inflation and business cycle effects, the model also includes the growth rate of Germany's industrial output index.

These three growth rate variables all were tested for stationarity using the Augmented Dickey-Fuller test statistic with a constant term included in the estimating equation. The results are summarized below in Table 1. The null hypothesis of non-stationarity is strongly rejected for each of the three variables, so the estimation techniques utilized in this paper are valid. The resultant ADF test statistics, their associated p-values, and # lags in the ADF equation were as follows (lag length based on minimizing AIC):

TABLE I. STATIONARITY TEST RESULTS

<u>Variable</u>	<u>ADF Statistic</u>	<u>P-Value</u>	<u>#Lags</u>
Inflation	-3.17	0.02	10 lags
Productivity Growth:	-3.69	0.004	4
Industrial Output Growth	-4.82	0.001	6

THE THRESHOLD MODEL

The general form of the threshold model used in this paper is given in equation one below. The model includes industrial output growth as an explanatory variable in order to account for the potential cyclicity of measured productivity growth with the business cycle. Failing to include a control for business cycle effects may lead to findings of spurious correlation between inflation and productivity growth (Sborrone & Kuttner, 1994; Freeman & Yerger 2000). Also, recall that while it is correct that the dependent variable already is adjusted for inflation as it is real output per worker, we still may find an impact from inflation upon this inflation-adjusted variable via one of the four channels outlined in the introduction section of this paper.

In the model, the parameter estimates on all variables can differ depending upon whether the observation comes from the “low” or the “high” inflation regime. Observations are assigned into the low (high) inflation regime if the value of their inflation threshold variable is below (above) the critical switching value used to divide the sample into two inflation regimes. If in Germany the adverse effects of inflation upon productivity growth are notably more pronounced in the upper end of the inflation range Germany experienced, then the threshold model should find a more deleterious impact from inflation in the high inflation regime.

$$(1) \quad \text{prod}_t = A^0(L) \text{prod}_{t-1} + B^0(L)X_t + \{A^1(L) \text{prod}_{t-1} + B^1(L)X_t\} * \text{DUM}(\text{thresh} > \text{critval}) + e_t$$

$A^0(L)$, $A^1(L)$, $B^0(L)$, and $B^1(L)$ are lag polynomials; prod_t is the productivity growth rate; X_t is the vector containing the inflation and industrial output growth measures; thresh is the threshold variable used to sort inflation regimes; critval is the selected critical value against which thresh is compared; and $\text{DUM}(\text{thresh} > \text{critval}) = 1$ if $\text{thresh} > \text{critval}$ and 0 otherwise.

For any given lag length structure on the exogenous and predetermined variables, if both the threshold variable “ thresh ” and the threshold value “ critval ” were known, then testing for nonlinear behavior of threshold would simply require testing the hypothesis that $A^1(L) = B^1(L) = 0$. In this case, however, economic theory alone does not provide guidance on the correct values for thresh and critval so they both must be estimated. As a result, standard inference techniques are not appropriate since, under the null hypothesis of no threshold effect, the variables thresh and critval are not identified. Over the past decade, a literature has emerged for testing procedures when “nuisance” parameters are present under the null hypothesis. In this paper we utilize one of the more straightforward tests developed by Andrews (1993).

Andrews derives test statistics for tests of parameter instability when the change point is unknown, or known to lie in a restricted interval. His sup-LR test statistic is the largest maximum likelihood ratio statistic found over the tested range of all possible threshold variables and threshold values (the sup-LR is asymptotically equivalent to the sup-Wald statistics similarly defined). In his paper, critical values are given for the rejection of the

linearity null hypothesis in favor of the alternative hypothesis that threshold effects exist. These critical values are used for the linearity tests on equation (1) in this paper.

Since economic theory does not support any particular lag length structure a priori, we proceeded as follows. The lag length on all variables (productivity growth, inflation rate, and industrial output growth) was varied from one to six lags. Additionally, since the standard practice in these types of threshold estimating equations is to use some lag of the hypothesized causal variable as the threshold variable, for each lag-length specification, one to six lags of inflation rate was tested as the threshold variable. (See Tsay (1989) for a discussion of this issue in the context of a univariate estimation model). Next, for each inflation rate lag threshold variable, the threshold critical value was varied by initially setting the threshold critical value at 1.60% and then raising the threshold critical value in 0.05% steps until the final iteration utilized a threshold critical value of 5.15%. These critical value boundaries were set in order to keep at least 15% of the observations in each inflationary regime. While these cut-offs are admittedly somewhat arbitrary, it turns out not to be an issue because the results find the threshold critical value to be comfortably removed from either of these two endpoints.

The 3 lag specification of equation (1) with 1 lag of inflation rate as the threshold variable, and 2.95% as the threshold critical value, generated the largest maximum likelihood ratio test statistic over the range of tested models. This is the value needed to compare against the critical values provided by Andrews (1993). As seen in Table 2, the linearity null hypothesis for equation (1) is strongly rejected as the max-LR test statistic of 31.55 is well above even the 1% critical value of 25.75. The findings imply a threshold critical value of 2.95% as the switching point between the low and high inflation rate regimes.

TABLE II. ESTIMATION OF EQUATION (1) SUMMARY OF RESULTS

Model's Estimated <u>Sup-LR Test Statistic</u>		Sup-LR Critical Values		
31.5		<u>10%</u>	<u>5%</u>	<u>1%</u>
		18.08	20.35	25.75
Estimated Parameter Values For Equation (1)				
<u>Low Inflation Regime</u>			<u>High Inflation Regime</u>	
<u>Variable</u>	<u>Sum of Coefficients</u>	<u>P-value</u>	<u>Sum of Coefficients</u>	<u>P-value</u>
Inflation	0.060	0.79	-0.297	0.03
Industrial Output Growth	-0.063	0.26	-0.305	0.000
Productivity Growth	0.676	0.000	1.040	0.000

The sums of the relevant parameter coefficients also are reported in Table II. Pay particular attention to the sum of the inflation rate coefficients in the two inflation rate regimes. In the low inflation rate regime, the coefficients sum to a positive 0.060 but the sum is not statistically significant as the p-value = 0.79. In the high inflation rate regime, however, the impact of inflation rate upon productivity growth is both negative and statistically significant with a parameter value of -0.297 and p-value of 0.03.

These results contradict previous findings of no impact from inflation rate upon German productivity growth in studies that imposed a constant linear relationship between inflation rate and productivity growth. Apparently, the prior findings of no adverse effects from inflation rate were due to the mixing of the low inflation rate and high inflation rate regimes' observations in the same regression estimation.

We do not argue that an inflation rate of 2.95% strictly divides the German Data into low versus high inflationary regimes across which the impact of inflation upon productivity growth differs as a consequence of some abrupt regime change. Instead we interpret these results as being broadly consistent with negative effects from inflation upon productivity growth emerging for Germany once the inflation rate moves into the upper one-half of the inflation range experienced by Germany over this sample period. The threshold switching model's abrupt regime change approach likely is approximating less abrupt changes in the underlying inflation-productivity relationship.

As a check on the conclusions derived from Table II, we analyze the results of equation (1) for each of the tested threshold critical values from 1.60% to 5.15% while maintaining the 3 lag for each variable specification with 1 lag of inflation rate as the threshold variable. These findings are summarized in Table III and indicate that the conclusions drawn from Table II are not sensitive to modest changes in the threshold critical value. First, note the sum of the inflation rate coefficients in the low inflation regime is never statistically significant for any of the potential threshold critical values. In contrast, examine the inflation rate coefficient results for the high inflation rate regime over the threshold critical value range from 2.00 to 4.00%. The

sum of coefficients always is negative and in most cases is statistically significant (pvalue < .10).

TABLE III. EQUATION (1) WITH VARYING THRESHOLD VALUES

Threshold		LOINF		HINF	Threshold		LOINF		HIINF
Value	LOINF	PV	HIINF	PV	Value	LOINF	PV	HIINF	PV
0.016	0.351	0.653	-0.202	0.040	0.034	0.174	0.324	-0.338	0.055
0.0165	0.665	0.283	-0.171	0.097	0.0345	0.183	0.289	-0.325	0.068
0.017	0.647	0.295	-0.179	0.086	0.035	0.183	0.289	-0.325	0.068
0.0175	0.647	0.295	-0.179	0.086	0.0355	0.183	0.289	-0.325	0.068
0.018	0.647	0.295	-0.179	0.086	0.036	0.175	0.301	-0.307	0.089
0.0185	0.651	0.250	-0.179	0.090	0.0365	0.072	0.657	-0.392	0.068
0.019	0.579	0.273	-0.203	0.071	0.037	0.072	0.657	-0.392	0.068
0.0195	0.579	0.273	-0.203	0.071	0.0375	0.074	0.642	-0.363	0.098
0.02	0.764	0.127	-0.182	0.094	0.038	0.069	0.663	-0.383	0.094
0.0205	0.532	0.227	-0.190	0.086	0.0385	0.069	0.663	-0.383	0.094
0.021	0.354	0.370	-0.192	0.088	0.039	0.064	0.678	-0.405	0.087
0.0215	0.354	0.370	-0.192	0.088	0.0395	0.063	0.670	-0.392	0.109
0.022	0.335	0.393	-0.222	0.054	0.04	0.101	0.483	-0.225	0.363
0.0225	0.407	0.269	-0.214	0.063	0.0405	0.077	0.591	-0.243	0.345
0.023	0.430	0.233	-0.196	0.090	0.041	0.061	0.665	-0.292	0.296
0.0235	0.304	0.389	-0.212	0.071	0.0415	0.080	0.566	-0.330	0.265
0.024	0.232	0.507	-0.256	0.031	0.042	0.084	0.548	-0.320	0.321
0.0245	0.320	0.359	-0.201	0.099	0.0425	0.084	0.548	-0.320	0.321
0.025	0.291	0.399	-0.208	0.100	0.043	0.024	0.863	-0.440	0.191
0.0255	0.291	0.399	-0.208	0.100	0.0435	0.058	0.663	-0.352	0.342
0.026	0.291	0.399	-0.208	0.100	0.044	0.055	0.675	-0.358	0.353
0.0265	0.211	0.471	-0.189	0.140	0.0445	0.055	0.675	-0.358	0.353
0.027	0.165	0.554	-0.183	0.154	0.045	0.055	0.675	-0.358	0.353
0.0275	0.165	0.554	-0.183	0.154	0.0455	0.055	0.675	-0.358	0.353
0.028	0.151	0.565	-0.296	0.021	0.046	0.055	0.675	-0.358	0.353
0.0285	0.187	0.454	-0.281	0.035	0.0465	0.032	0.804	-0.474	0.233
0.029	0.060	0.794	-0.297	0.032	0.047	0.032	0.804	-0.474	0.233
0.0295	0.060	0.794	-0.297	0.032	0.0475	0.032	0.804	-0.474	0.233
0.03	0.167	0.449	-0.263	0.079	0.048	0.043	0.732	-0.429	0.327
0.0305	0.300	0.156	-0.248	0.115	0.0485	0.043	0.732	-0.429	0.327
0.031	0.255	0.218	-0.236	0.144	0.049	0.043	0.732	-0.429	0.327
0.0315	0.255	0.218	-0.236	0.144	0.0495	0.049	0.687	-0.272	0.556
0.032	0.255	0.218	-0.236	0.144	0.05	0.049	0.687	-0.272	0.556
0.0325	0.212	0.294	-0.252	0.132	0.0505	-0.039	0.739	-0.393	0.425
0.033	0.254	0.172	-0.276	0.108	0.051	-0.039	0.739	-0.393	0.425
0.0335	0.254	0.172	-0.276	0.108	0.0515	-0.022	0.841	-0.356	0.483

LOINF- sum of inflation coefficients from equation (1) in low inflation regime; LOINF-PV- pvalue of test that LOINF=0; HIINF- sum of inflation coefficients from equation (1) in high inflation regime; HIINF-PV- pvalue of test that HIINF=0

These findings support two general conclusions regarding inflation's impact upon productivity growth in Germany. First, as inflation rates approached and exceeded 3.0%, further

inflationary shocks did appear to have an adverse impact upon productivity growth. Once inflation rates fell close to or below 2.0%, however, there is no evidence that any further reduction in inflation favorably impacted productivity growth.

CONCLUSION

Previous research investigating the impact of inflation upon German productivity growth over the past 40 years failed to find a statistically significant negative impact from inflation after correctly controlling for business cycle effects. That research, however, utilized standard causality testing methods that impose a constant linear relationship between inflation and productivity. This paper allows for the existence of threshold effects and finds that for Germany in the 1960's through 1990's inflation did have an adverse effect upon productivity growth.

The finding, however, is confined to the defined "high" inflation rate regime and when inflation is in the "low" inflation rate regime, there is no statistically significant impact from inflation upon productivity growth. The threshold value dividing the high and low inflation rate regimes lies in the upper 2% to low 3% inflation range. Once inflation exceeds that level, further inflation shocks do appear to reduce productivity growth. This finding supports those who argue for low inflation rates as a means to aid productivity growth. In particular, it is consistent with the view that the German Central Bank's strong commitment to low inflation in the post World War II era contributed to Germany's strong record of productivity growth over this time. The finding suggests that if the European Central Bank ultimately is as successful as was Germany's Central Bank at maintaining low inflation rates, then productivity growth across the entire Euro zone will be enhanced.

At the same time, however, this paper's findings do not support a policy goal of zero inflation as has been called for by some. Once inflation rates reach the low 2% range or below, this paper finds no evidence that further inflation reductions would aid productivity growth.

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FRAMING AS A DYNAMIC PROCESS: A STUDY OF U.S. PRESS COVERAGE OF THE SARS EPIDEMIC

Li Zeng, Arkansas State University
zengli@astate.edu

ABSTRACT

This study examined from a dynamic perspective how the New York Times covered the SARS Epidemic. Based on a two-dimensional model, the study revealed that during the life span of the SARS Epidemic (March 2003 to January 2004), the newspaper employed a frame-changing strategy on both the time and space dimensions to maintain the salience of the event. An overwhelming majority of the stories employed the core frames, which were the frames that originally registered the event on the news agenda. The data also revealed that during the 11-month period, the newspaper shifted its focus on the core frame combinations, which further supported the role of the frame-changing strategy in the coverage of a long-lasting event.

INTRODUCTION

The SARS epidemic was a tragedy that alerted the whole world about the “vulnerability of global health systems” (Chang, Salmon, Lee, Choi, & Zeldes, 2004). Eventually claiming more than 800 lives throughout the world (WHO, 2003, August 15), the disease remained ignored for almost four month until international news media reported it extensively following a SARS warning by the WHO in March 2003 (WHO, 2003, March 12). Due to the lack of human knowledge about the disease as well as the way in which coronavirus, later known as the cause of SARS, was transmitted, the news media closely watched the development of the epidemic during the following months. Studies have been conducted to analyze the content of SARS coverage from a static perspective (e.g., Chang, Salmon, Lee, Choi, & Zeldes, 2004; Luther & Zhou, 2005). However, the Epidemic remained on the media agenda for nearly a year. In order to keep the public’s interest in an event over such a long period of time, the media have to employ strategies to keep the topic refreshed. This study examined the media portrayal of the SARS epidemic as a dynamic process.

LITERATURE REVIEW

Media framing refers to the process in which the media select and package ongoing events and issues (Entman, 1993; Iyengar, 1991; Ryan & Sim, 1990; Schon & Rein, 1994). The concept of framing involves two levels of selection, selection for inclusion and selection for emphasis. Because there are multiple aspects of a certain news event or issue, but news holes are limited, only certain facets of the event or issue can be included in a news story. Among the aspects included in a news story, some receive more emphasis than others, thus constituting the dominant frames. It was through the selection of these elements for inclusion and emphasis that media frames “promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation” (Entman, 1993, p. 52).

The way a news event or issue is framed is influenced by forces ranging from gatekeepers at various levels, to ideology (Shoemaker & Reese, 1991). Although news events and issues are presented as a “constructed reality” (Turk & Franklin, 1987, p. 30), how an event or issue is framed has a considerable impact on people’s perception of social reality (e.g., McCombs and Reynolds, 2002; Tewksbury, Jones, Peske, Raymond, & Vig, 2000; Valkenburg, Semetko, & DeVreese, 1999). During times of crisis, particularly, the media become an almost exclusive source of information for the public, as people seek from the media for information, explanations, and interpretations (Graber, 1980).

However, in framing research news frames are often treated from a static perspective. The fact is that as a news event develops, the media tend to highlight different aspects of the event to fulfill media functions at different stages. Graber (1980), for example, identified three stages of media coverage as a crisis develops: providing accurate information to relieve uncertainty and calm the public during the first stage, assessing the crisis during the second stage, and contextualizing the crisis during the last stage. Likewise, Ungar (1998) suggested that the media might change framing strategies under certain circumstances. For instance, when a crisis becomes “unpredictable and potentially threatening” (p. 36), instead of providing merely hair-lifting facts, the media may frame the event in such a way as to contain the situation and console the public. Nevertheless, little is known on the process during which the media change their framing strategies.

Another limitation of traditional framing research is the lack of generalizability of framing scales. Because each news event or issue is unique, there has been little agreement on which frames to study and even less agreement on the categories that each frame constitutes, not to mention the difficulty to develop exhaustive and mutually exclusive categories (Chyi & McCombs).

A recent attempt to liberate framing research from issue-specific limitations from a dynamic perspective is a two-dimension measurement scheme that takes into account the media focus on both the space and time dimensions (Chyi & McCombs, 2004). Chyi & McCombs identified five categories on the space dimension, which are individual, community, regional, societal, and international. In addition, they identified three categories on the time dimension, past, present, and future. They proposed that during the life span of a news issue or event, the media would adopt a frame-changing strategy to keep the event or issue salient. Based on their analysis of the Columbine School Shooting in the *New York Times*, Chyi & McCombs (2004) found that the media employed combinations of different frames on the space and time dimensions to keep the event on the media agenda. However, only a quarter of the total coverage adopted the core frames, the frames that were relevant to the nature of the event and “initially propelled” the event onto the news (p. 31). The majority of the news coverage used combinations of extended frames that changed over time. It was not clear why the newspaper relied more heavily on extended frames than the core frames when packaging the event. More extensive testing of the scheme is needed to establish generalizability of the scheme in framing research.

This study tested Chyi and McCombs’s two-dimensional scheme (2004) in the coverage of a multi-wave international event in the *New York Times*. The original scheme was used to examine the coverage of the Columbine School shooting, an event that attracted a high level of media attention for two weeks after its occurrence, and remained on the media agenda for approximately another two weeks with diminishing media attention. The SARS epidemic, however, was a more complicated event with multiple waves during its life span. First, there was the explosion of the disease in the southern Province of Guangdong at the beginning of 2003.

After the WHO was informed of the case in Vietnam and named the disease SARS in March 2003, there was a second wave of the epidemic around the world. Several months later, after the WHO announced the disease was contained, another case was identified in a laboratory in Singapore. This new case aroused public unease in some parts of the world. Finally, as the winter drew close in China, the public were reminded about the first SARS case in November 2002 and warned about the resurgence of the disease. Not unexpectedly, a new case was confirmed in January 2004 (Single SARS case confirmed, 2004). This study tested whether Chyi and McCombs's scheme could be applied to the coverage of such a complicated event in the same newspaper.

Based on Chyi and McCombs's two-dimensional scheme (2004), this study asked the following research questions:

RQ1: How were the SARS stories distributed in the *New York Times* during the life span of the epidemic?

RO2: How did SARS coverage change on the space dimension?

RQ3: How did SARS coverage change on the time dimension?

RQ4: How was the use of space frames correlated with the use of time frames?

METHOD

Sample

This study employed the method of content analysis to reveal the framing pattern during the life span of the SARS epidemic as a news event. The Lexis-Nexis database was searched using a keyword for SARS or Severe Acute Respiratory Syndrome in the *New York Times* between March 2003 and January 2004. The *New York Times* was selected based on its widely recognized leading role in covering international news. The WHO issued its first global alert about the disease in March 2003, which was followed by a worldwide media focus on the outbreak. The media attention gradually shifted away from the epidemic after the WHO announced that the disease was globally contained in June 2003 (WHO, 2003, July 5). However, the epidemic maintained its salience on the media agenda until January 2004, largely due to some sporadic cases in various parts of Asia in the following months. After January 2004, SARS was mostly mentioned in stories about the later spreading avian influenza (commonly known as bird flu).

The keyword search yielded 1,098 stories from the database. A sample of 140 stories was constructed using the systematic sampling method.

Coding Instrument

The coding instrument in this study was borrowed from the scales by Chyi and McCombs (2004). The coding unit is a story. Each story was coded individually on the *date of publication*, the *space* dimension, and the *time* dimension. The space dimension included five categories. A story was coded in the individual category if it emphasized individual SARS patients, reactions from their families or friends, or contextual information about individual SARS cases or

probable cases without referring to a larger area related to the cases. A story was in the community category if it emphasized the SARS situation in a local area, such as a large hospital, a town or a small city. A story was in the regional category if it emphasized the situation in a large metropolitan such as Toronto or Beijing, a special region such as Hong Kong, a province/state, or a large area that is within the border of a certain country. The national category was a slight variation from Chyi and McCombs's (2004) societal level. A story was in this category if it emphasized the situation within a specific country. Finally, a story was in the international category if it emphasized the situation across national borders, e.g., SARS research led by the WHO.

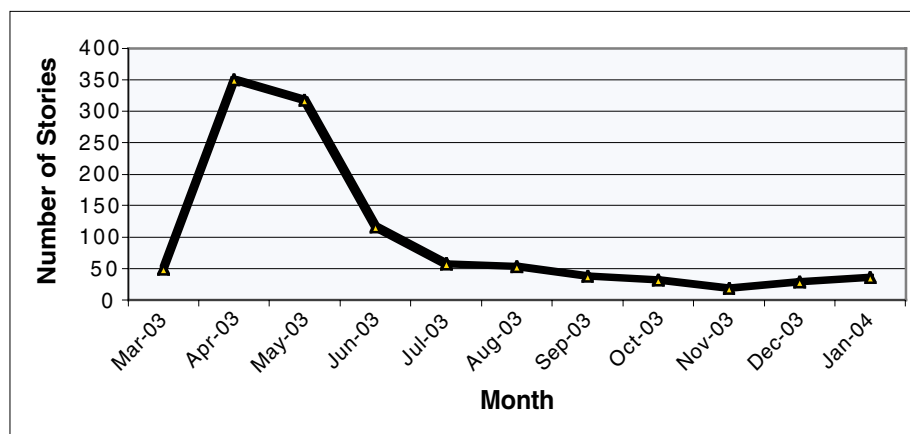
The *time* dimension included three categories: past, present, and future. A story was coded in the past category if it mainly provided historical background or traced relevant events in the history, such as influenza or AIDS. A story was in the present category if it focused on updates of the ongoing SARS epidemic. A story was in the future category if it made predictions about further developments about the situation, proposed actions to be taken, or evaluated future impacts of the event, including preventive procedures and proposals for future medical research.

Inter-coder Reliability Check

A graduate student and the researcher participated in an inter-coder reliability check. A random sample of 30 stories was constructed using the remaining stories in the sampling frame after the original sample was selected. The two coders coded independently by using a coding protocol prepared by the researcher, which provided detailed instructions and definitions for the variables. The Holsti's inter-coder reliability for all the variables fell within the highly satisfactory range of .87 to 1.00 (Holsti, 1969). Specifically, the two coders reached a total agreement on story placement and the time dimension, and agreed on 87 percent of the coding on the space dimension. The graduate student coded all the 140 stories in the sample.

FINDINGS

The first research question asked how the SARS stories were distributed over time. As displayed in Figure I, a total of 1,098 articles were published on the SARS epidemic over the 11 months under analysis. After picking up the topic on March 16, 2003, the newspaper cast intensive



**FIGURE I. SARS COVERAGE IN THE NEW YORK TIMES
(MARCH 2003 – JAN. 2004, N=1,098)**

attention on the event in April and May 2003, publishing an average of more than 10 articles about the outbreak on a daily basis. However, the amount of coverage suddenly dropped in June. After July 2003, when the WHO announced that the whole world had conquered SARS, the media focus gradually shifted away from the epidemic, with coverage reaching the lowest point in November 2003. Slightly more SARS stories appeared around the turn of 2004, partly due to the widespread suspect about a revival of the disease during the winter months.

Research question two asked how the framing of the SARS epidemic changed over time on the space dimension. The data suggested that international frames were the dominant frames on the space dimension, alone accounting for nearly half (42.9%) of the total. One out of three stories (36.4%) employed a national frame, and another 13.6 percent of the articles adopted a regional frame. Very few stories used a frame at the individual (5%) or community level (2.1%).

A closer examination of the three dominant space frames revealed a changing pattern over time. While international and national frames apparently led the coverage of the SARS epidemic during the 11-month period, there was no clear-cut tendency in frame-changing on the space dimension. The whole framing process featured a zigzag path at all three leading levels (Figure II). International frames were the mostly frequently adopted frames when the event first entered the media agenda in March 2003. However, the percentage of international frames in total continuously decreased until it reached an all-time low point in July, accounting for only 30 percent of the total. There was a dramatic increase in the use of international frames in August and September 2003, indicating that the media focus was shifted back to discussion in a broader global context. The percentage of international frames suddenly dropped during October and November, but regained momentum in January 2004, reaching another peak of 75 percent of the total.

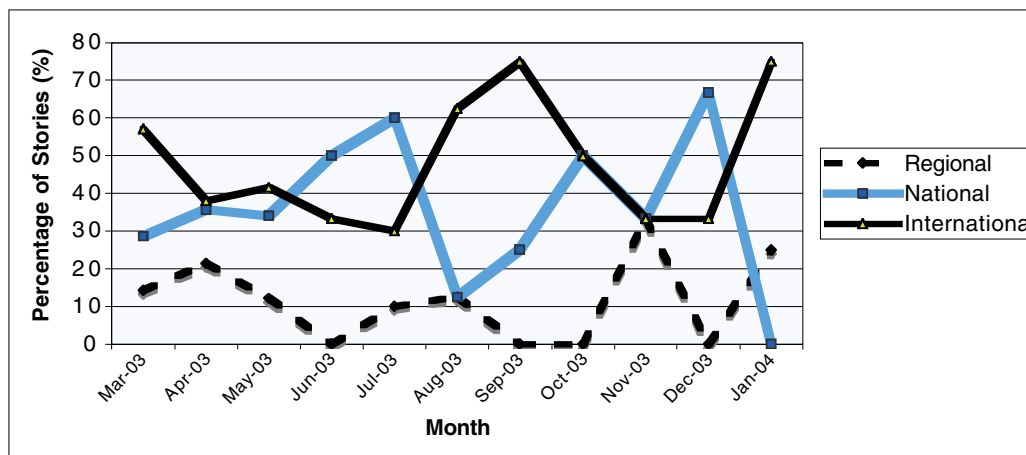


FIGURE II. FRAME-CHANGING ON THE SPACE DIMENSION (N=130)

The overall pattern of international and national frames suggested that the two types of frames complemented each other. Although not a leading frame at the very beginning, national frames gradually gained salience during the first few months of the SARS Epidemic. The percentage of national frames suddenly ebbed from 60 to slightly over 10 percent in August 2003, and then gradually increased (with some decrease in between) to reach a peak in December, after which national frames suddenly disappeared altogether. The ebb and flow reflected the shift of the newspaper's focus from and to discussion of the SARS outbreak within a national context.

The change in the number of space frames displayed in Figure III suggested that regional frames were somewhat frequently used in stories published in April and May 2003. During the remaining months, very few stories were contextualized within certain parts of a specific country.

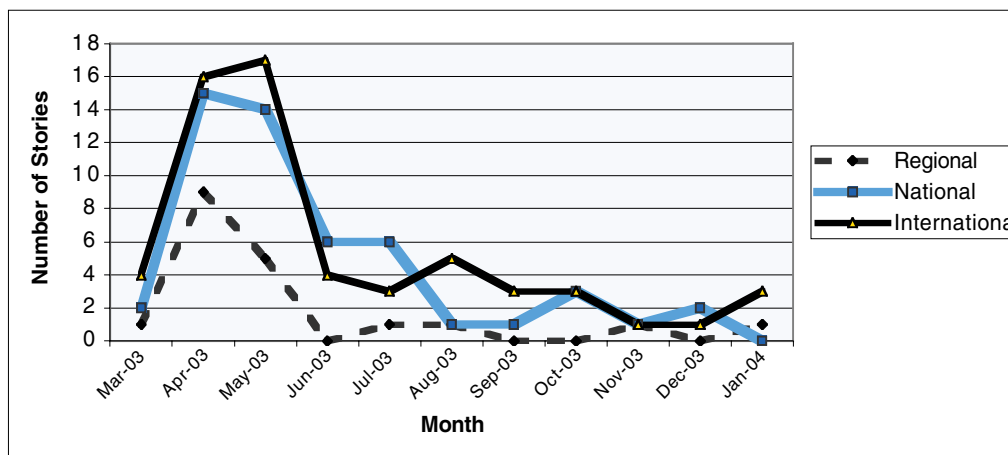


FIGURE III: CHANGE OF SPACE FRAMES IN THE NUMBER OF STORIES (N=130)

Research question three asked how the framing of the SARS stories changed on the time dimension over time. Data analysis showed that only a negligible proportion (1.4%) of the stories employed past frames. Figure IV displays the distribution of present and future frames. Present frames were the most dominant frames during the whole life span of the SARS epidemic. During the first few months of the outbreak, and in September and December 2003, an overwhelming majority of the articles employed present frames. Due to the limited use of past frames over time, the use of future frames and present frames were complementary. When the media attention slightly shifted away from current updates of the SARS situation, predictions and proposition about future preventive procedures gained some prominence.

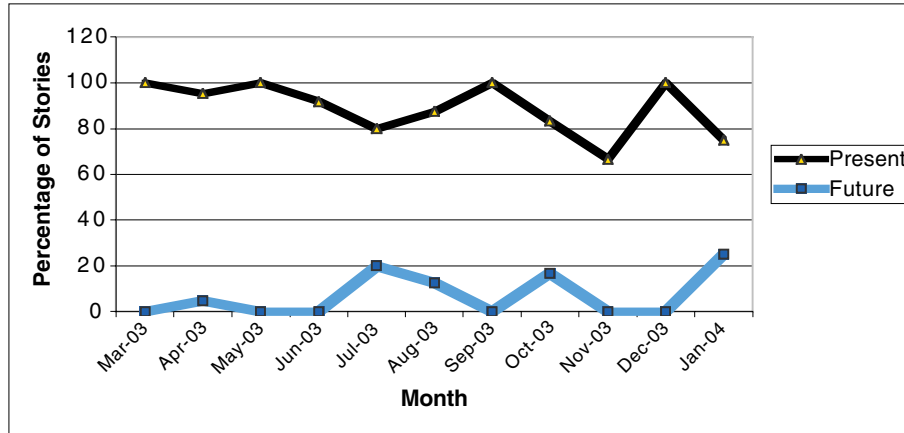


FIGURE IV. FRAME-CHANGING ON THE TIME DIMENSION (N=138)

Because SARS coverage in the *New York Times* tailed off after May 2003, a distribution of the number of stories adopting various time frames may be more revealing. As illustrated in Figure V, the number of stories employing present frames reached a peak in April and May 2003, and gradually decreased during the remaining months. The number of stories using future frames remained low during the whole process, with slight fluctuations in April and July 2003.

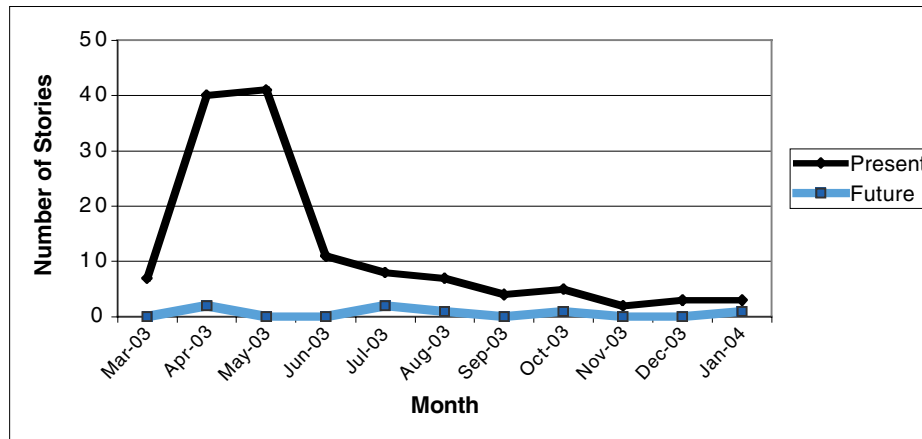


FIGURE V. CHANGE OF TIME FRAMES IN THE NUMBER OF STORIES (N=138)

Research question four concerned the relationship between frame use on the space and time dimensions. Chi-square results in Table I suggested that on all three levels of space frames that were frequently used (regional, national, and international), present frames were always the most prominent on the time dimension. No significant correlation of frame use on the space and time dimension was identified ($X^2 = .375, p. > .05$).

TABLE I. CORRELATION OF SPACE AND TIME FRAMES

		Time Frame		
		Present	Future	Total
Space Frame	Regional	17 (13.3 %)	1 (.8%)	18 (14.1%)
	National	48 (37.5%)	2 (1.6%)	50 (39.1%)
	International	56 (43.8%)	4 (3.1%)	61 (46.9%)
$X^2 = .375, df = 2, p. = .829$				

Discussion and Conclusions

This analysis of SARS coverage in the *New York Times* suggests that, as this multi-wave event unfolded, media coverage of the event was a dynamic rather than static process and frame-changing was employed as a strategy to keep the event alive on the news agenda. It provides empirical evidence that Chyi and McCombs's two-dimensional model (2004) is applicable to a multi-wave crisis with international influence.

The SARS Epidemic received intensively coverage in the newspaper, particularly during the first four months (March-June 2003), when most of the SARS cases were reported and knowledge about the disease was highly limited. In terms of the severity of the disease situation and quantity of published news stories, these four months were the peak of the SARS Epidemic. Large doses of information were provided to help the public assess and interpret what was going on. While the SARS cases found in September 2003 and January 2004 joined the thousands of cases identified during the peak and made the epidemic a multi-wave crisis, the cases during the later months of the epidemic were merely sporadic and the situation of the disease was by no means as severe as it was when SARS hit the world in March 2003. Therefore, as the data indicated, the *New York Times* published approximately three quarters of the SARS stories in the first four months. During the following months, regular but non-intensive coverage ensured that the disease remained on the agenda but the ranking was no longer high.

The amount of SARS coverage during the early stage of the epidemic reflected the news media's role in relieving information anxiety among the public during a crisis. Under circumstances of uncertainty, the public may demand tremendous amount of information, sometimes more information than the media can provide (Neal, 1998), for explanation, interpretation, and consolation (Graber, 1980; Schramm, 1965).

The frame-changing pattern on the time dimension revealed in this study was to a certain extent consistent with what Graber (1980) described as three stages of media coverage during a crisis. During an early stage of a crisis, which was the first few months of the SARS Epidemic in this study, the media focused on updating the disease situation, therefore using mostly present frames. As more had been revealed about the disease and the level of uncertainty and anxiety among the public decreased, the media employed more future frames than did in the earlier stage to place the crisis in a broader, long-term context.

There are two possible explanations for the limited use of past frames. One is that SARS was so new to the whole world that insufficient background information was available as the crisis

unfolded, even months after it broke out internationally. However, SARS is not the first disease that originated from animals, unexpectedly infected human bodies, and remained incurable. Another explanation is that the newspaper focused almost exclusively on the changing disease situation that it ignored contextual information. As a consequence, the audience received inadequate background information to help readers better assess the disease situation.

On the space dimension, the epidemic started as an international disease and affected a number of countries during its life span. Therefore, international frames were the dominant space frames in the early stage (which happened to be the peak) of SARS coverage. At the same time, nearly as many articles were published using national frames. An explanation for the heavy use of national frames is that the countries that were the center of the reported cases during the peak of the epidemic were scattered around the world (from Southeast Asia to North America), and the sporadic cases identified during the remaining months were contained within national boundaries. Therefore it is not surprising that in the SARS-infected countries the outbreak can be considered more a national occurrence than a global disease (Zeng, 2006).

The core frame (Chyi and McCombs, 2004), which referred to the frame that initially registered the SARS outbreak on the U.S. media agenda, was the “international plus present” combination. Although not an all-time dominant frame, this core frame was employed in nearly half of the coverage during the whole process, indicating that the newspaper focused primarily on the attributes most relevant to the event.

On the other hand, the heavy use of the extended frame, the “national plus present” combination, was a reflection of the nature of the SARS epidemic as a national occurrence, especially when the stories were written from the perspective of a SARS-hit country (Zeng, 2006). Switching between international and national frames suggested that the newspaper took into consideration of the nature of SARS by changing the importance of the international and national perspectives over time.

Consistent with previous research, findings from this study suggest that framing of a news event is an on-going process (Chyi and McCombs), although clear-cut patterns of frame-changing are sometimes hard to identify. In a multi-wave event that lasted a long time like the SARS epidemic, the patterns of frame-changing can be very complicated. Further research should reveal the factors behind such changes. In addition, more attention is needed to examine from a dynamic perspective other aspects of framing, such as characterization of a news event and how sources are used.

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