EXPLORING COMPLEX GREEN MESSAGES IN ADVERTISEMENTS WITHIN THE BUILDING INDUSTRY

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EXECUTIVE SUMMARY

Over the past two decades the connection among information, consumer behavior, and the environment has received significant attention. There is a growing interest in the role that information has in the encouragement of environmentally-preferable products and its impact on the environment. Nevertheless, its implications are by no means yet fully understood, and the ultimate objective of promoting sustainable patterns of consumption remains to be seen, especially when companies often find themselves claiming environmental messages with little substantiation or are hesitant to communicate this information at all to avoid negative reputational or legal repercussions.

In this report we look at the complexities associated with environmental information and its subsequent communication in advertisements, exploring the relationship of information complexity and credibility as key constructs that influence environmental communication performance. Recent emphasis on Life Cycle Assessment (LCA) information is presented as holding some promise by which improved communication effectiveness of environmental/sustainability claims may materialize. A framework is proposed by which information complexity and credibility mediate the effect of individuals' attitudes toward the ad itself, the brand, the company, and purchase intention.

Data was collected during November 2006, resulting in a total of 1,346 architects (21.5 response rate), all of which are members of the United States Green Building Council (USGBC). Individuals were randomly assigned to receive one of 8 insulation advertisements developed with support from an advertising/graphic designer and with significant input from the Communication Committee of the North American Insulation Manufacturing Association (NAIMA). In terms of responding organizations, over half (54 percent) receive between $1 and $20 million in revenues, and the primary line of business of these firms are commercial buildings (31 percent), followed by educational (18 percent) and residential construction (15 percent). Only six percent of firms (across all sizes by revenue) indicated sustainable design as their primary line of business. All constructs used in this study were developed primarily from previously validated multi-attribute measures.

Primary results indicate that:

- Elaborated functional advertising messages with disaggregated claims do not provided additional improvement of communication effectiveness, hence, it is probable that without competitive

product comparisons, when functional product benefits are the sole focus of advertisements simpler ads will be preferable.

- The credibility gained through more elaborated environmental messages [resulting from the inclusion of LCA information], to a high extent, compensates the effect of complexity on the attitude toward the appealing of the ad itself. In fact, this credibility strongly influences in a positive manner the attitudes buyers have toward the ad, the brand, the company, and their intention to purchase the product under evaluation.

- Practitioners should recognize that negative advertisement appeal is potentially damaging to the overall marketing communication strategy of a firm. Simple messages are often required to gain market awareness and break through the noisy hypermedia marketplace. Nevertheless, the overall purchase behavior is influenced by multiple other factors beyond the appealing of the ad itself. Thus, when it comes to environmental performance information, keeping it simple may maintain ad appeal but negatively impacts other factors influencing purchase behavior.

- We found that the attitudinal response of buyers toward the brand and the company were not influenced by their perceived level of the advertisement complexity. In particular, it is evident from our research that those respondents with more experience have less favorable attitudes toward the appeal of the ad, the brand, the company, and credibility as compared to novices; however, all view the complexity of the ad in a similar manner. Thus, it's important to develop specific communications devoted to these market segments.

In summary, it appears that when companies intend to communicate environmental (non-functional) messages, the inclusion of disaggregated LCA information is appropriate. These results are of particular importance today when brand image is considered an important asset to companies. With an increasing pressure from multiple stakeholders toward environmental and social responsible activities, the credibility gained with these less appealing ads might be in the long term a fruitful approach.

REPORT AT A GLANCE

A considerable amount of research has been devoted to environmental communications; nevertheless there is still controversy about its impact to companies and society. We consider that part of this dilemma originates when environmental messages are explored in isolation as opposed to being in conjunction with central (functional) messages related to product performance. Thus, with this research we explore the appropriate mix between functinal and environmental (non-functional) messages and the mechanisms by which consumers process this information along the dimensions of advertisement complexity and credibility. While these non-functional (ancillary) messages are often easily communicated when the message itself is simple (e.g., brand identity, quality, brand partnerships, philanthropic associations), as the nature of these messages becomes increasingly complex, questions emerge as to the amount of information required to effectively communicate these types of information and the impact of these efforts on more central (functional) product claims. This relationship is explored within the business-to-business (B2B) context of environmental communications, specifically examining complex environmental product performance information within marketing communications targeting the building industry. Results indicate that advertisements with environmental messages are more effective than those presenting functional product benefits but only when they are substantiated with quantitative and disaggregated information [resulting from LCA studies].

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INTRODUCTION

Following the seminal works of Nelson (1970, 1974) and Darby and Karni's (1973), the effect of advertising as an information source is different according to when product characteristics can be identified and verified. Information assisting a consumer in determining a product's quality are characterized by search, experience and credence attributes. Search attributes can be identified before buying, whereas experience attributes cannot be verified before buying or using the product (i.e. goods and services). Credence attributes are all the product's properties that cannot be determined by the consumer at any case, even if the product is bought and consumed. The advertising content can therefore be thought to inform directly about the quality of search attributes (color, content, availability, etc.) and indirectly— through the advertised brand—about the quality of experience (taste, performance, reliability, etc.) and credence attributes (nutritional information, chemical substance content, environmental impact, etc.).

Information on search attributes is relatively plentiful and easily attained, though subject to consumers' ability to perceive and process information - an issue further developed in subsequent sections of this paper. In contrast, for experience and credence attributes, without adequate information, consumers run a risk of purchasing a product that will not increase their utility, negatively affecting them financially, or potentially negatively impact their health, safety, or ability to secure similar utilities in the future. In order to reduce these risks, consumers try to learn about the product's attributes in various ways. They can obtain marketing communications from competing suppliers, talk to others who have experienced the product (word-of-mouth, mass media, on-line product reviews, blogs, etc.), seek expert opinion from third-party certifiers and governmental and nongovernmental organizations, and in some cases through trial purchases.

In addition to the above work addressing product attributes - based on when, or if, product information can be obtained and processed - another stream of research examines the assessment of products based on the benefits delivered. Product benefits are the personal value a consumer attaches to an attribute, and the evaluation of products seldom relies on a single benefit but rather on a combination of multiple benefits (Keller 1993). For example when evaluating service quality, aspects such as reliability, responsiveness, assurance, along with aspects such as guarantees/warranties, evidence of excellence, and availability help reduce the perceived risk of the service under evaluation (LaBand et al. 1995). Park, Jaworski and MacInnis (1986) further distinguished product benefits into three categories: functional, symbolic and experiential. Under this typology, functional benefits correspond to the attributes associated with, "*the ingredients necessary for performing the product function as viewed by consumers*" (Keller 1993). In contrast to the temporal distinction of product information described previously, functional benefits are determined by the consumers' needs that motivate the search for products that solve a current consumption problem or prevent a potential one (Park, Jaworski and MacInnis 1986). Experiential benefits are defined as those related to what if feels like to use the product, and are underlined by the desire for pleasure, variety and cognitive stimulation. Finally, symbolic benefits are those not directly linked with the product, but are connected to internally underlying needs such as self-fulfillment or self-enhancement, often used by people as guiding principles in their life for choosing and justifying actions such environmentally-friendly behavior . In theory, any product can be positioned based on any of these three product benefits and that these benefits directly link product attributes and consumer needs (Keller 1993; Park, Jaworski and MacInnis 1986). This framework therefore implies that the functional benefits of products are intended to solve more fundamental needs which require fulfillment prior to the consideration and evaluation of experiential or symbolic needs. Because they are by their very nature connected directly to the central consumptive problem, functional benefits have been widely considered as central in product evaluations, theoretically and empirically (Keller 1993; Batra and Ahtola 1990; Park, Jaworski and MacInnis 1986; Woods 1960). Nevertheless, the absence of other non-functional product performance information can lead to negative evaluations, especially in mature products or competitive situations where the functional benefits are fairly familiar (Swan and Combs 1976).

While the focus of much of this research centers on consumer markets, similar to end consumers,

business buyers also attempt to balance the overall evaluation of products between functional and non-functional performance benefits. Organizational buying is often characterized by highly informed and involved buyers, and by long buying cycles culminating in large purchases and automatic (or semiautomatic) repurchasing requiring much more "rational" buying behavior (Johnston and Lewin 1996; Lilien 1974), hence, the role of non-functional product benefits stands to be more influential in these settings. Many business markets purchase decisions hinge on the outcome of a bidding process between competitors offering similar products and services. In an effort to avoid competing solely on price, a number of business marketing researchers suggest that a supplying firm's ability to provide greater perceived customer value – vis-à-vis rival firms' products - hinges on its knowledge of the customer-specific combination of functional and non-functional attributes influencing the purchase decision (Anderson et al. 2006; de Chernatony and Riley 1998; Wilson 1995; Wolter et al. 1989). Thus, unlike consumer markets, where building a recognizable brand is very important, in business markets information aimed at reducing the buyer's risks and/or costs of production or improving operations are of significant importance (Dwyer and Tanner 2006; Henthorne et al. 1993; Bunn 1993). Given that much of this information, often comingled in a "solutions" or "relationship" framework, cannot be verified prior to purchase commitments of significant volume, the credibility of this information is paramount.

Environmental information is difficult to communicate.

- Environmental issues are themselves complex and require significant disclosures in light of many information asymmetries.
- The legitimacy of multiple stakeholders, each one providing often conflicting expert information to an already crowed media marketplace.
- Consumers and buyers function within a skeptical-mode when exposed to environmental messages.

This paper contributes to the current literature by explicitly examining the role of salient functional and non-functional information in business-to-business trade advertisements. Specifically, we focus on the non-functional product attribute of environmental product performance, an increasingly important dimension in the purchasing decisions of architects designing high performing green buildings, in conjunction with more central functional performance messages. With the emergence of a number of green building initiatives and rating systems, many building materials manufacturers have begun to recognize and assess the impacts of their products on these environmental aspects and communicate this information to a growing number of interested architects and builders, resulting in a U.S. market for green building materials estimated at $21.1 billion in 2005 (BCC Research 2006). This process, however, is much easier said than done. Even in the case of products with significant environmental advantages over competition, firms struggle with how to communicate these messages and are uncertain of the effectiveness of these claims in assisting customers and prospects through the buying process. In addition, despite experts' calls for more specific and better supported environmental performance information in corporate and marketing communications, companies often find themselves claiming environmental messages with little substantiation or are hesitant to communicate this information at all to avoid negative reputation or legal repercussions.

We look to the growth in Life Cycle Assessment (LCA) and LCA-based metrics as holding promise by which improved communication effectiveness may materialize. These methodologies of measuring material resources, energy consumption, and environmental impact of products throughout its life have gained significant notice by both the LEED and Green Globes building rating systems, and are anticipated to play increasingly prominent roles in their future development. Thus, we explore within an building/home insulation products setting, the mechanisms by which customers process environmental information resulting from highly sophisticated and internationally recognized environmental assessment techniques. Based on a thorough review of the persuasion and environmental literature we forward and test the hypothesis that ancillary environmental performance messages help to increase the communication effectiveness when they are included in addition to only functional product

performance messages. Thus, the research question examined in this paper becomes two-fold:

1. Do non-functional environmental messages complement or impair functional product performance information?
2. How do LCA/elaborated claims influence the communication effectiveness of messages?

The paper proceeds with a review of mechanisms employed by consumers, business or otherwise, to process messages and propose a framework by which complexity and credibility mediate the effects by which explicit non-functional advertising messages may improve communication effectiveness. We then provide a description of the experimental setting, elaborating on the recent "greening" trends within the building industry, and the emphases placed on life-cycle assessment techniques and the communication of its information. Next, we present our methodological approach and describe the multiple measure scales employed in the study. Finally, empirical results based on controlled experiments of message exposure are presented and discussed. Concluding remarks, along with limitations and venues for future research, bring the paper to a close.

A FRAMEWORK FOR PROCESSING ELABORATED MESSAGES

In the pursuit of more effective advertising, researchers have tried to understand the relationship between consumer's attitudes toward the advertisement (AAD), the brand (ABR), the company (ACO), and purchase intention (PI). The causal relationship hypothesized among these variables has provided a better understanding of the advertising framework commonly accepted today in the marketing literature (e.g. MacKenzie and Spreng 1992; Mackenzie, Luzt and Belch 1986; Mackenzie and Luzt 1989; Batra and Ray 1986). Many variants of this model have been proposed over the years, all of which assume that an attitude shift is required prior to purchasing (e.g., Vaughn 1980). Attitudes toward the ad (AAD) or the predisposition to respond in a favorable/unfavorable manner to a particular advertising stimulus during a specific exposure has been considered an important factor that drives attitudes toward the brand (e.g. Shimp 1981) and toward the company (e.g. Winters 1986). Furthermore, primary based on the ideas of Ajzen and Fishbein (1974), attitudes are believed to influence behavior through behavioral intentions. In the advertising framework this means that the purchase intention (PI) of an individual for a particular product is importantly considered the result of his attitudes toward the ad (AAD), the brand (ABR) and the manufacturer (ACO) of such product. These causal relationships could also occur in different order depending on which attitude is more salient at the particular moment of evaluation, that is, a previously built attitude toward a company may influence the attitude an individual has for a particular brand or advertisement. For example, corporate credibility has been suggested as an important antecedent to attitudes toward the ad itself (Goldsmith et al. 2000).

The credibility of a firm's intentions at a particular time is the result of the firm's past actions or developed reputation (Herbig and Milewicz 1993) which is built upon consistent delivery of products over time and through its marketing signaling. This mechanism alerts reputation if it repeatedly fails to fulfill them. Managing perceptions of credibility is of significant importance in that consumers evaluate credible companies' advertisements more favorable, and have been found to buy their products over those of less credible competitors (Keller 1998).

While credibility based on the source of the information is beneficial in creating positive associations with a brand in the absence of technical information, in situations where the lack of information detail (or the ambiguity of information) leave consumers with little opportunity to make meaningful decisions, claims can be perceived as deceitful and negatively impact the product, its brand, the company and its endorser. To illustrate this point, consider the food industry and the myriad of credence information presented daily to consumers. Messages such as "organic", "low-fat", "light", "Non-genetically modified", "low in sugar" often lack the detail necessary to distinguish differing levels of performance between products, resulting in ambiguous claims, at best, and misleading or deceitful claims at worse (Kangun et al. 1991).

An obvious solution to this problem is proving consumers with more explicit information to

elaborate upon the claim and potentially further support a functionality, benefit, or position. However, as the nature of informative advertising messages becomes increasingly explicit and the number of product benefits grows, questions emerge as to the amount of information required to effectively communicate these types of information and the impact of these efforts on more central product functional performance claims. The amount of information communicated within advertisements can vary along two general dimensions, the explicitness of information within a message and number of messages (or benefits) communicated in the advertisement. In both cases, taking these approaches often increases the complexity of the communication medium through the use of technical jargon, additional visual elements, or simply more information requiring processing from the recipient. Hence, marketers face the dilemma that each additional message competes for the scarce resource of consumers' attention. In today's hypermedia environment, each additional message in turn, adds to the media noise of the marketplace reducing the marginal efficiencies of subsequent communications (Wu and Newell 2003). The advertising community has responded to this dilemma primarily through creative mechanisms (whether in content or in media selection), but have shown general restraint when it comes to increasing the message explicitness within the advertisement. The primary argument for this behavior is based on the assumptions that consumers often seek to minimize their cognitive effort, have limited ability, and a low threshold for boredom (Anderson and Jolson 1980; Shuptrine and McVicker 1981).

Other researchers, however, suggest that complex advertising can be more effective (Stewart and Koslow 1989; Chamblee et al. 1993; Abernethy and Franke 1996; Phillips 1997; Lowrey 1998). It is thought that the increased processing effort required by consumers to process complex messages may affect attitude formation and memory. Such rationale is based on the dual models of information processing such as the heuristic-systematic model (Chaiken 1980; 1987; 1994), and the Elaboration Likelihood Model (ELM) of persuasion (Cacioppo and Petty 1984; Petty and Cacioppo 1986; Petty, Cacippo and Schumann 1983). These dual processing models shed some light in attempting to predict the possible outcomes of this research. That is, consumers with high knowledge, motivation, and need for cognition, will be more likely to use the central route of persuasion, thus, finding ads with more information highly satisfactory. Similarly, subjects less involved and with lower cognitive needs, tend to be more positively impacted by simpler ads. Thus,

H1: *Communication effectiveness will be higher when the ad provides information about a non-functional environmental benefit in addition to the functional benefit; as oppose to an ad with information related to its functional benefit only.*

H2: *Advertisements conveying high explicit messages are more effective than advertisements with low explicit messages.*

While less research has looked at the number of benefits linked to a product (Romaniuk 2003; Alba and Marmorsteing 1987), according to the Elaboration Likelihood Model, the number of message' arguments or product' benefits serve as important prompts. These prompts are thought to be of greater significance when individuals are not motivated or do not have the cognitive capacity to engage in detail message elaboration (Petty and Cacioppo 1984). Based on the idea of associative network models, multiple distinct messages enable individuals to bring to short-term memory elements of the product that otherwise wouldn't be available if only a single message is conveyed (Meyers-Levy 1989; Murdock 1982). Petty and Cacioppo (1984) suggest that more arguments will better persuade these individuals and that the behavioral effect on buyers may be based on the number of claims included in the ad rather than the quality of those claims (Alba and Marmorsteing 1987). Furthermore, Krishnan (1996) found that the number of attributes that people elicited about a product was positively linked to its equity, and, Rominiuk (2003) found evidence that the more attributes a consumer associates with a brand, the higher the probability of purchasing that brand in the future. Hence,

H3: *Advertisements conveying a higher number of product benefits are more effective than advertisements with fewer messages.*

We, therefore, base a conceptual framework for the effectiveness of multi-message informative advertisements on the notion that non-functional information contained within them, often represents experience, credence, and/or symbolic attributes necessitating explicit disclosures and significant

credibility for their effectiveness. This framework is illustrated in **Figure 1.** While one could conceptualize a model where complexity and credibility play a mitigating role in the effectiveness of functional information messaging, for the sake of experimental simplicity and for the reason that function information is often more straight forwardly communicated and assessed prior to purchase, we focus our attention on non-functional claims. This is not to say that functional information is ignored, rather, the degree of explication and elaboration in both functional and non-functional product information claims is conceptualized as impacting the effectiveness of the communication. In this sense, one could imagine cases where advertising messages skewed heavily toward non-functional information could reduce the effectiveness of the advertisement (as measured by attitudes toward the advertisement, attitudes toward the brand, attitudes toward the company, and purchase intent) due to a poor assessment of the functional benefits of the product and their ability to meet the basic consumptive needs of the customer. Similarly, advertising messages skewed heavily toward functional information, where salient non-functional information is inadequately explicit in detail, might also be ineffective due to the lack of credibility of the claims and the effect of this on brand and/or company attitudes. A description of the specific multiple measures employed, as well as the control variables developed for this particular study, are elaborated upon in subsequent sections.

EXPERIMENTAL SETTING

The emergence of environmental performance as an important ancillary message

Environmental management and its pursuit of environmental performance is recognized today as key factor in the organizational management (e.g. Maignan, Ferrell and Ferrell 2005; Friedman and Miles 2002; Mitchell et al. 1997) and competitive strategies of businesses (Hoffman 2006, Porter and Van der Linde 1995). However, even eco-pioneers still find it difficult to integrate such activities with the companies overall management systems. The ISO 14001 Environmental Management Systems standard is but a decade old, and despite its increasing popularity (over 110 thousands facilities certified worldwide and a 20 percent annual growth rate), the system itself isn't necessarily an indicator of either strong environmental or financial performance (Carraro and Leveque 1999; Krut and Gleckman 1998).

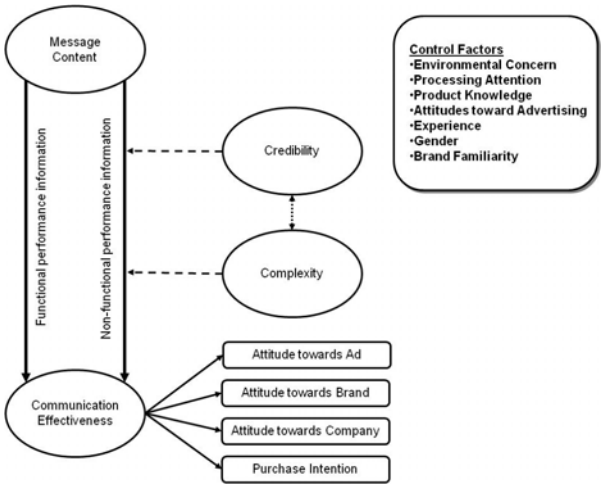

Figure 1. Conceptual model of communication with functional and non-functional performance messages

In turn, companies are still required to find creative ways to communicate environmental performance to its vast range of stakeholders, including suppliers, customers, shareholders, regulators, communities, the media and others. While the last two decades have proofed that successfully competing on the environmental dimension is difficult, this new market is worthy of consideration. The end-consumer market size of sustainable products has been estimated to be around $2 billion (Roberts 1996, LOHAS 2005) and for companies selling to other organizations the magnitude is significantly higher. The U.S. Federal Government alone procures from its contractors over $200 billion annually and several executives' orders (e.g. 13101, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition) encourage government agencies to give preference to "green" products. Another example of market demand can be seen in Wal-Mart's recent announcement to aggressively encourage its 60,000 suppliers to create products that don't harm the environment (Hudson 2007). Other high profile examples, including GE's Ecomagination initiative – creating over $10 billion in revenues in 2005 which are expected to double by 2010, are emerging at a rapid pace.

In addition to the market growth for high performing environmental products, significant improvements in environmental assessment techniques have also materialized over the past two decades resulting in substantial increases in available environmental performance information. At the forefront of this trend are a family of techniques and analysis frameworks collectively referred to as Life Cycle Assessment (LCA). These assessments are rigorous and quantitative, and address the multiple environmental impacts of a product's complete life span (**See Figure 2**). LCA methodologies have developed significantly over the past two decades importantly supported by the Society for Environmental Toxicology and Chemistry (SETAC) and the United Nations Environmental Program (UNEP), evolving into the development of international standards for their implementation, application, and communication at the International Organization for Standardization (ISO). Companies have devoted substantial resources to implementing formal Life Cycle Assessments of their products and services (LCA) and many are now pursuing the use of this information in marketing communications and positioning strategies. Few industries are embracing this trend more enthusiastically than that building industry.

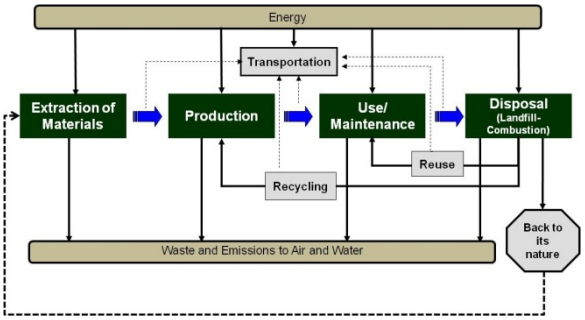

Figure 2: Life Cycle Assessment (LCA) diagram.

The "greening" of the building industry

According to a statistical summary compiled by the U.S. EPA in 2004, the impact of buildings on the environment in the U.S. accounts for 39 percent of total energy use, 12 percent of the total water consumption, 68 percent of total electricity consumption and 38 percent of the carbon dioxide emissions. A recent study found that housing, transport and food are responsible for 70% of the environmental impacts in most categories across a 25 European country sample (Tukker and Jansen 2006). Due to the rising costs of energy and increased global political activity around greenhouse gas emissions, a variety of assessment programs have been developed around environmental and energy impacts of buildings. The first building' environmental certification system was created in 1990 in the UK, The Building Research Environmental Assessment Method (BREEAM) addressing design issues that affect the global environment, local environment and the health and well being of building occupants. In 1998 the Leadership in Energy and Environmental Design (LEED) green building rating system was introduced by the U.S. Green Building Council. In 2005, the Green Building Initiative (GBI) launched Green Globes by adapting the Canadian BREEAM/Green Leaf system to the U.S. market. Similar market-based rating, certification, assessment systems have emerged throughout Europe, Asia, and Austrialia and have a remarkable impact on the building materials industries. In the U.S. the market for green building materials was estimated at $21.1 billion in 2005 (BCC Research 2006), and Lockwood (2006) predicts that green construction will become a mainstream technology in the next 5 to 10 years.

With this growth comes a significantly high amount of new information of varying detail and veracity, making it hard for buyers to disentangle the myriad of new and suspicious messages. Thus, the building industry has also turned to LCA and its increasingly standard methodologies. At least 14 LCA-based tools have been developed globally which have specific application in the building industry, each containing various peculiarities, specific to their country or region (Trusty and Horst 2005).

Consumer information tools and Life Cycle Analysis (LCA) are also mentioned in the plan of implementation of the 2002 Johannesburg World Summit on Sustainable Development, and have played a significant role in the European Commission's efforts toward Integrated Product Policy (Frankl et al. 2007). Within the U.S., the National Institute of Standards and Technology, along with the U.S. Departments of Energy and Agriculture, have developed BEES (Building for Environmental and Economic Sustainability) to measure the environmental performance of building products by using the life-cycle assessment approach specified in the ISO 14040 series of standards, informing a number of federal procurement policies.

Finally, certification programs such as BREAM, LEED and Green Globes have recently adopted LCA criteria as part of their rating systems or have launched significant initiatives in an effort to include information from this technique in future versions. All of these developments have lead building materials manufacturers and suppliers into a frenzy as they attempt to communicate the environmental performance of their products and position themselves for acceptance in this new market.

The experimental setting for this study focuses on a controlled experiment examining informative advertising messages of a fictitious insulation product. Functional benefits of the product include typical performance attributes of the category, including r-value ratings and the benefit of design flexibility. Non-functional product benefits are represented through various disclosures of environmental performance information and further elaborated to included information pertinent to health and economic non-functional benefits. By *explicitness of messages* we mean the inclusion of a disclosure with quantitative information further clarifying and/or substantiating the base claim. With regard to environmental performance claims, LCA-based environmental performance information is utilized to substantiate the claims.

As indicated before, product benefits are the personal value an individual attaches to an attribute, therefore, in our context of environmentally preferable products, we further distinguish environmental performance claims among private and public benefits. While a full discussion of the economics literature addressing costs and benefits of externalities is outside the scope of this paper, we note that the value allocated to products is often through free market, described as a series of utility maximizing contracts between relevant individuals. This free market assumes that: (a) individuals act rationally by choosing to maximize utility; (b) information is available to make rational, utility maximizing decisions; and (c) social welfare is the aggregate of individual welfare and that 'the public interest' will be achieved by individuals acting in a self serving manner (Smith, A. 1776/1987). However, there is ample evidence that a free-market fails to direct individuals towards environmentally-friendly behavior, and that this occurs mainly because markets for environmental products normally do not exist. Thus, their true cost is not priced into market transactions (Barbier 1989; Coase 1960; Pigou 1932). Therefore, individuals do not bear the full cost of making choices that cause social damage, also called "externalities". The issue of external benefits is related to that of public goods, which are goods where it is difficult if not impossible to exclude people from their benefits (e.g. clean air, public fireworks, law enforcement). Through our experimental design, we test very simply an ad where the environmental performance information is further elaborated in a way that includes an additional public benefit (a health benefit associated with reduced emissions) and an additional private benefit (an economic benefit associated with reduced energy costs).

METHODOLOGICAL APPROACH

Eight advertisements (**see Table 1**) were created to evaluate the effects on communication effectiveness of non-functional (environmental) information and functional information. Three different disclosures of the ad were modified as follows: (a) *theme disclosure*, which is associated with a functional (TDF) or environmental performance (TDE) description of the product under evaluation; (b) *elaborated disclosure*, involving specific and quantitative statements associated with a functional or environmental performance description of the product (i.e. TDFD and TDED); (c) *private benefit disclosure,* including both an image and a textual statement of either a functional benefit (FUN), a financial benefit (FIN) or a health benefit (HEA).

Table 1. Information included in the advertisements under evaluation

Ad #	Theme disclosure	Explicit disclosure	Private benefit disclosure
1	Functional Performance	----	Functional
2	Functional Performance	Functional Performance	Functional
3	Environmental Performance	----	Functional
4	Environmental Performance	Environmental Performance	Functional
5	Environmental Performance	----	Financial
6	Environmental Performance	Environmental Performance	Financial
7	Environmental Performance	----	Health
8	Environmental Performance	Environmental Performance	Health

This methodological approach is similar to that one in other studies in the area of consumer research/behavior (e.g. Cotte et al. 2005; Putrevu et al. 2004; Golberg and Hartwick 1990; Laferty and Goldsmith 1999). An innovative aspect, however, is the use of electronic web-based questionnaires

which included an image intended to simulate a magazine-type advertisement. According to the Reed Research Group (2003) within the building industry professional magazines or newsletters were rated as the primary source of information about green building products.

Our sample is composed of architects, all members of the United States Green Building Council (USGBC). Individuals were randomly assigned to receive one of the 8 insulation advertisements developed (i.e. 780 individuals per ad). Following suggestions from the Dillman (2000) "tailored design method" for executing mail and internet surveys, an explanatory email was developed asking individuals to participate in the study, housed within a separate web-based location. Both, the original e-mail request and a followed reminder were directly sent by the USGBC. Once on the webpage, respondents were asked to look at the insulation ad "at your preferable own pace, as when reading your favorite magazine". The ads were produced with support from an advertising/graphic designer and with significant input from the Communication Committee of the North American Insulation Manufacturing Association (NAIMA). A fictitious brand name was created to avoid bias due to brand familiarity (Brooks and Highhouse 2006). This was of special importance in our context because consumers' existing perceptions of a corporation's environmental concern may influence their attitudes toward the company, its products and purchase intention (Davis 1994). Following the advertisement observation task, a questionnaire was administered to all subjects to assess their perceptions on attitudes toward the ad (AAD), the product brand (ABR), the company (ACO) and purchase intentions (PI) and to assess perceptions toward informational complexity and credibility. A web-base questionnaire was particularly desired because subjects were not able to flip through questions ahead of time, nor they were able return to view the advertisement once the observation task was complete. In addition, the internet-based data is easier and less costly to collect, handle and process.

MEASURES

Most measures in this study used semantic differential or bipolar scales and were entirely or partially adopted from previous research (**Table 2**). A previous experiment conducted by the authors with a different sample helped to assess and purify the measures. A brief description of each measure is presented below.

Complexity (COM): This scale is similar to the resource demands scale developed by Keller and Block (1997) to measure the degree to which a stimulus requires a person to devote high cognitive efforts for it to be understood. The items measuring the complexity of the ad were: "The ad was simple to understand"; "The ad was easy to follow"; and, "The ad was complicated" on a 7-point agreement scale.

Table 2: Measurement scales used in the study.

Construct	No. of Items	References
Complexity (COM)	3	Keller and Block (1997).
Credibility (CRE)	3	Cottle et al. (2005); Newell and Goldsmith (2001), Golberg and Hartwick (1990).
Attitude toward the ad (AAD)	3	MacKenzie and Lutz (1989); Muehling (1987a).
Attitude toward the brand (ABR)	3	MacKenzie and Lutz (1989); Muehling (1987a)
Attitudes toward the company (ACO)	8	Newell and Goldsmith (2001).
Purchase intention (PI)	3	Yi (1990); Putrevu et al. (2004); MacKenzie, Lutz and Belch (1986).
Product knowledge (KNO)	3	Kent and Allen (1994).
Energy Star' familiarity (STA)	3	Oliver and DeSarbo (1985)
Environmental concern (EC)	5	Cordano et al. (2003); Cordano et al. (2004)
Attention devoted to the message (ATT)	4	Ha (1996); Laczniak and Muehling (1993).
Attitudes toward advertising (ADV)	9	Obermiller and Spangenberg (1998); Muehling (1987b)

Credibility (CRE): This measure uses a combination of items previously evaluated by Cottle et al. (2005); Newell and Goldsmith (2001) and Golberg and Hartwick (1990). It measures the credibility of the ad as "convincing", "credible" and "biased" (reverse coded) in a 7-point scale varying from "Strongly agree" to "Strongly disagree".

***Attitude toward the ad* (AAD)** and ***attitude toward the brand* (ABR)** are measures borrowed from MacKenzie and Lutz (1989) and Muehling (1987a) and use a seven-point bipolar scale anchored as "good/bad", "favorable/ unfavorable", "pleasant/unpleasant".

Attitudes toward the company (ACO): This measure covers honesty and expertise as two fundamental aspects of corporate reputation. We used a recently developed scale by Newell and Goldsmith (2001) composed of 8 items in a seven response scale varying from "Strongly agree" to "Strongly disagree".

*The **Purchase intention*** **(PI)** measure comes from Yi (1990) and Putrevu et al. (2004) based on the work of MacKenzie, Lutz and Belch (1986). This 3 item-measure was anchored in a 7-point bipolar scale as: "very likely/very unlikely", "probable/improbable", "possible/ impossible".

CONTROL VARIABLES

From the respondents point of view, and based on information processing theory and its further developments, it is necessary to account for the influences of factors such as *need for cognition*, *knowledge,* and *gender* (Cacioppo and Petty and Kao 1984; Cacioppo and Petty 1982, Putrevu et al. 2004). Other variables having possible effects and thus included in the model as control variables are: *environmental concern*, and attitudes towards *advertising* in general. From a company and product perspective, company *goodwill* and product quality could also affect the outcomes, therefore, familiarity with the brand and company name was controlled throughout the development of completely new ads. Similar to the development of tested constructs, scale items used in the development of control variables are discussed below.

Product Knowledge (KNO) and Experience (EXP): Researchers have found evidence that experts (as oppose to novices) rely more on informational sources (Choong and Lord 1996) enabling them to encode the abundance of cues presented in complex advertisements. Putrevu et al. (2004) found that knowledgeable individuals are also capable of evaluating technically and visually complex messages since they have better understanding of what they are evaluating, they have higher processing ability (MacInnis et al 1991), and higher efficiency of information search (Putrevu and Ratchford 1997). Product knowledge was measured using 3 seven-point items developed by Kent and Allen (1994) varying from "Very familiar/Very unfamiliar", "Very experienced/Very inexperienced", and "Very knowledgeable/Very unknowledgeable". Experience was measured by asking the number of years as a professional within the industry.

Energy Star familiarity (STA): this voluntary labeling program was introduced by the U.S. Environmental Protection Agency (EPA) in 1992 and expanded in 1999 to cover the building industry. Products and buildings could be certified if conforming to a series of energy performing standards. It has been suggested that advertising for familiar brands may not work in the same way as advertising for unfamiliar brands (Machleit, Allen, and Madden 1993); thus, we assess the familiarity of respondents with the Energy Star brand using a scale developed by Oliver and DeSarbo (1985) asking participants the following 3 item-measure, anchored in a 7-point bipolar scale: "Familiar/Unfamiliar", "Informed/ Uninformed", "Knowledgeable/ Unknowledgeable".

Environmental concern (EC): In an effort to reduce respondent fatigue, we used a recently developed abbreviated scale which evaluates the predictive validity of the original (Dunlap and Van Liere 1978) and revised (Dunlap et al. 2000) New Environmental Paradigm (NEP) scale. This abbreviated scale developed by Cordano et al. (2003; 2004) includes 5-items which has been shown to significantly explain the variance of the intention of individuals to engage in pro-environmental behavior.

Attention devoted to the message (ATT): Based on the dual information processing theories, it is important to consider the individual's *need for cognition* or the tendency to engage in and enjoy thinking (Cacioppo, Petty and Cao 1984). However, even their short scale includes 18 items and high chances are that our busy respondents would skip this question or abort the questionnaire. Thus, we used instead an alternative scale which does not measure the need for cognition but at least provide a self-assessment of their processing effort devoted when looking at the ad (Laczniak and Muehling 1993). This scale was developed by Ha (1996) and asked participants the following 4 items on a 7-point agreement scale: (1) "I paid attention to the content of the ad"; (2) "I carefully read the content of the ad"; (3) "When I saw the ad, I concentrated on its content"; (4) "I expended effort on the content of this ad".

***Attitudes toward advertising (ADV)*:** Although advertising once had a favorable opinion by the public, during the 1980s studies found a growing distrust, with most surveys indicating that advertisements did not present an accurate description of products (Shavitt, Lowrey and Haefner 1998). Mehta (2000) found that the performance of individual ads (in terms of recall and buying interest) is influenced by consumers' attitudes toward advertising in general. In a similar manner, others have also argued that ADV should be accounted for when measuring attitudes toward the ad

(O'Donohoe 2001; Muehling 1987b). A 9-item Likert-type agreement scale was used to measure consumers' perceptions toward advertising skepticism based on the work of Obermiller and Spangenberg (1998).

***Gender*:** Researchers have noticed that males and females exhibit differing types and depths of elaborative processing (e.g. Putrevu et al. 2004; Chamblee et al. 1993). It is suggested that these differences can be partially attributed to the differing psychological orientations of men and women. For males, the agency orientation denotes a single, self-focused perspective; for females, the communion orientation of concern for others related to traditional societal roles. Therefore, when processing ad claims, women are likely to encode verbal and nonverbal message cues more accurately and with higher elaboration due to their superior sensory capabilities (Chamblee et al. 1993; Meyers-Levy and Maheswaran 1991).

PRESENTATION AND DISCUSSION OF RESULTS

The main goal of this study is to identify the relationships among research constructs as perceived in consumers' minds, specifically the role of information complexity and credibility on variables of functional and non-functional informational messages communication effectiveness. Below, we begin by briefly describing the sample and checking the manipulation of treatments. We then, similar to Molina 2007 (the previous chapter in this Thesis), conduct two main analyses in order to assess the hypothesized relationships. We first explore these relationships using regression analyses; and secondly, we employ a structural equation model to further assess multi-path relationships.

Sample description

Data was collected during November 2006, resulting in a total of 1,346 responses (21.5 response rate). The average number of minutes participants expended to complete the questionnaire was 12.22 minutes (median=10). After a preliminary data inspection a substantial number of incomplete questions were found in both end of the time spectrum, thus, we decided to use only those respondents completing the questionnaire with half and twice the median, hence, the lower and upper bounds were 5 and 20 minutes respectively, excluding 9.8 percent of respondents in the lower bound and 10.3 percent in the upper bound. Several of these respondents still partially completed the questionnaire. In addition, respondents for which English is the second language were also excluded. The sample used in subsequent analyses consists of a total of 1,062 respondents, of which 64.3 percent were males and the remaining 35.7 percent were females. Around half (50.54 percent) identified themselves as architects only, and one third have other high profile roles such as president/CEO, associate partners or project managers. Less than 1 percent have specific titles related to green/sustainable building (**See Figure 3**).

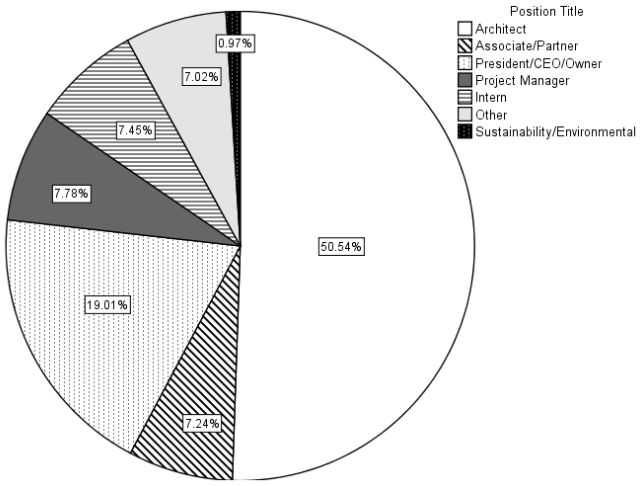

Figure 3. Distribution of respondents by their position title.

Mostly all respondents (87.54 percent) are LEED accredited (i.e. accredited by the USGBC as green building designers). In terms of total professional experience as architects, fifty-eight percent of respondents have more than 10 years and only less than a quarter (23 percent) have 5 or less years of professional experience. In terms of their companies, twenty-five percent of them receive annually $1 million or less in revenue; over half (54 percent) receive between $1 and $20 million; and fifteen percent receive between $20 and $100 million. The remaining six percent receive more than $100 million in revenue every year. The primary line of business of these firms are commercial buildings

(31 percent), followed by educational (18 percent) and residential construction (15 percent). Six percent of firms (across all sizes by revenue) indicated sustainable design as their primary line of business (**See Figure 4**).

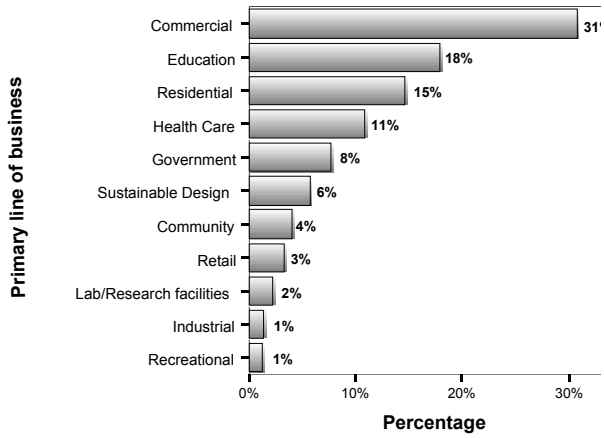

Figure 4. Distribution of respondents by the primary line of business of the company they work for.

Non-Response bias test

Although we received a relatively strong response rate considering the kind of population examined; there could be concerns about the answers of those who decide not to response. A well accepted extrapolation method was used in examining potential non-response bias by comparing early and late respondents (Armstrong 1977). The existence of possible non-response bias was investigated among those who responded to the questionnaire in the first request and those in the follow-up reminder. This methodology implies that those who respond to the latest request would have similar views to those who did not responded. No significant differences were detected between these two groups along a number of key variables at α= 0.05 (**see Appendix 1**). Based on this analysis, concerns of non-response bias have been set aside.

Analysis of scales

As described in the methodology section, our constructs were developed primarily from previously validated multi-attribute scales. **Table 3** provides the Cronbach's alpha measure of reliability. All coefficients are above 0.70, the minimum level of reliability commonly recommended (Nunnally 1994). Also items within constructs were subjected to a principal component factor analysis with varimax rotation to assess unidimensionality. All variables conform to the unidimensionality criterion except the attitude towards the company (ACO), where two factors were extracted, encompassing, as expected, the company dimensions of honesty and expertise. Our factor analysis indicated that these two dimensions accounted for 72% of the variance (**See Appendix 2**).

Table 3: Measures of reliability check.

Construct	N	Mean	Variance	Reliability (Cronbach α)
Complexity (CRE)	999	4.68	2.19	**0.853**
Credibility (COM)	999	4.45	1.237	**0.852**
Attitude towards the ad (AAD)	999	4.65	1.609	**0.863**
Attitude toward the brand (ABR)	991	4.25	1.066	**0.945**
Attitude toward the company (ACO)	991	4.05	0.715	**0.885**
Purchase Intention (PI)	991	4.33	1.194	**0.886**
Product Knowledge (KNO)	976	5.26	1.262	**0.922**
Energy Star Familiarity (STA)	966	5.44	0.660	**0.923**
Environmental Concern (EC)	955	5.30	1.172	**0.839**
Processing effort (ATT)	955	5.28	1.754	**0.926**
Attitude towards Advertising (ADV)	**915**	**3.18**	**1.551**	**0.919**

Regressions on communication effectiveness variables and Environmental Performance

To test whether non-functional environmental disclosures (TDE and TDED) improve the communication effectiveness over functional messages (TDF and TDFD), several regression analyses were carry out. Results are summarized in **Table 4**. One important finding indicates that although mentioning environmental LCA information (TDE) positively influences PI (0.172; p-value= 0.026) it does not help the credibility of the ad (CRE), in fact, it is negatively influenced (-0.206; p-value= 0.001). However, when elaborated LCA information (TDED) is presented (i.e. shown with quantitative and specific environmental impact results), a significantly positive effect is created toward CRE, AAD and PI of the product under evaluation. Although we anticipated that this could occur for all

types of elaborated messages, this was not the case with those ads which only included functional performance information (TDFD); none of the coefficients of our dependent communication effectiveness variables showed significant effects. One possible explanation to these results is that our experienced respondents (i.e. 58 percent of total respondents have more than 10 years of professional experience) already know enough about the functional performance of these products in general, that the additional details don't make much of a difference to actually perceive the elaborated messages as more effective. Nevertheless, as we have anticipated, environmental arguments are often viewed with less understanding and with higher skepticism, thus the additional disaggregated information provides enough substantiation to make the ad more credible (0.244; p-value= 0.001), more favorable (0.239; p-value= 0.001), and influencing positively the purchase intention (0.115; p-value= 0.001).

We did not find support for the hypothesis that including a private environmental benefit disclosure will increase the communication effectiveness over a message with only a public one. That is, the inclusion of an additional financial (FIN) or health (HEA) benefit disclosure did not created any significant effect over a message with a product functional performance statement (FUN), nor there were significant differences among them in terms of complexity, credibility, attitudes or purchase intention. We acknowledge that our respondents are not the private receivers of the product benefits, but as business buyers, they could have processed the information with little interest in benefiting their clients. One could counter argue that a builder/architect could potentially obtain higher margins by means of a higher price or lower transaction cost if the end consumer is able to save some money; however, this is just a potential benefit that the architect might not see obviously tangible. With health related benefits, the architect might feel more incline to specify or recommend a product with less risk; however, the time lag for the benefit/harm to become evident could be so long (low probability), that once again the architect could process this information with little interest.

The two mediating constructs (complexity and credibility) had significant influence on the communication effectiveness measures, and support previous research examining these effects (Molina 2007). The complexity of how the ad is perceived (COM) negatively influences its general attitude (-0.321; p-value= 0.001) and its purchase intention (-0.078; p-value= 0.001), although attitudes toward the brand (ABR) and the company (ACO) were not affected in a significant manner. On the other hand, the perceived credibility (CRE) of the information presented in the ad had a significant positive effect on all the communication effectiveness measures (i.e. AAD, ABR, ACO and PI). Although regression analysis are useful to determinate possible effects among variables, they don't necessarily account for the influence of error terms across the multiple model paths as conceptualized in our model, thus we further explore our framework with a latent variable structural equation model (LVSEM).

Table 4: Regression results of all dependent variables.

	COM	CRE	AAD	ABR	ACO	PI
INDEPENDENT VARIABLES						
Intercept term[a]	4.082*	3.869*	3.358*	2.091*	2.077*	-0.471*
TDFD	0.214	-0.022	0.018	-0.084	0.057	0.125
TDE	0.201	-0.206*	-0.024	-0.035	-0.079	0.172*
TDED	0.078	0.244*	0.239*	-0.039	0.046	0.115*
FIN	0.171	-0.034	0.068	-0.028	-0.014	0.010
HEALTH	0.20**	0.026	-0.035	0.033	0.096*	-0.112**
Complexity (COM)			-0.321*	-0.035	-0.004	-0.078*
Credibility (CRE)			0.349*	0.149*	0.320*	0.256*
Attitude toward the ad (AAD				0.356*	0.121*	0.168*
Attitude toward the brand (ABR)						0.186*
Attitude toward company (ACO)						0.348*
CONTROL VARIABLES						
Gender (GEN)	0.099	-0.004	-0.080	-0.054	0.019	-0.072
Product Knowledge (KNO)	0.002	-0.077*	0.029	-0.049	-0.037*	0.051**
Energy Star Familiarity (STA)	0.060	0.037	-0.017	0.065	0.039**	0.024
Environmental Concern (EC)	0.071**	0.019	0.001	-0.054	0.013	0.062*
Processing effort (ATT)	-0.320*	-0.004	0.113*	0.005	-0.048*	0.014
Professional Experience (EXP)	0.007	-0.014*	-0.009*	-0.004	-0.005*	-0.008*
Attitude toward Advertising (ADV)	-0.100*	0.319*	0.099*	0.078*	0.073*	0.061*
Adj. R^2	0.095	0.154	0.362	0.282	0.450	0.546

[a] The base line advertisement includes a Functional Theme Disclosure (TDF) with a Functional Private Disclosure (FUN).
* Significant (p 0.05)
** Significant (p 0.10)

Latent Variable Structural Equations Model Analysis

Structural equation modeling (SEM) was used to estimate the parameters of the model as shown in **Figure 5**. As suggested by Boomsma (2000), instead of writing all the equations specified in the model, we let the diagram itself describe those relations. Several methodological aspects are mentioned, especially for readers who would like to replicate these analyses. In terms of structure, all the

exogenous variables were selectively related to three endogenous latent variables (i.e. Complexity as η_1; Credibility as η_2 and AAD as η_3). The first two (i.e. η_1 and η_2) are hypothesized to have an effect on η_3; and all of them are related to the rest of the endogenous latent variables (i.e. ABR as η_4; ACO as η_5; and PI as η_6). Because not every respondent answered all key questions, the structural model included 915 observations with a total of 45 observed variables (a.k.a. manifest variables) specified for 20 latent variables. Each latent variable was scaled directly to a variance of one using the first observed variable as the indicator. The covariance moment matrix was used in the analysis; however, for simplicity; the correlation matrix is presented in **Appendix 3**. In its most general formulation (Joreskog 1971) the structural equation model was defined by three simultaneous equations specifying the measurement model of the endogenous variables, the exogenous variables, and the structural model.

In order to obtain more stable parameter estimates and proper solutions of model fit, several researchers (e.g. Little et al. 2002; Bandalos 2002; Hall et al. 1999) have suggested to parcel observed variables into the specification of latent variables. As explained by Holt (2004), it is highly recommended that variables be parceled randomly only if unidimentionality of the construct exists; otherwise, similar facets of the structure need to be classified into the same item parcel. Thus, ADV was randomly reduced to 3 instead of 9 observed variables and ACO was parceled from 8 to only 2 variables based on the results from the factor analysis previously discussed and presented in **Appendix 2**.

In the theoretical model we purposely omitted a direct relationship between attitude towards the brand (ABR) and attitude toward the company (ACO), assuming that when subjects are exposed to an ad, they simultaneously develop attitudes toward the brand (ABR) and toward the company (ACO) as opposed to a sequential or causal relationship. In the past, researchers have hypothesized this relationship in either direction depending on which stimulus they where first exposed (i.e. to the brand or to the company). In our case, subjects were exposed for the first time to both simultaneously, thus, following the suggestion by Maruyama (1998) we allow the unexplained portion of their variance to covary. A similar approach was taken with regard to the relationship between complexity and credibility, instead of forcing them to a fixed causal path, we also allow them to covary. According to the dual processing model of information processing there are instances when complex messages (i.e. with many details) enable more credible perceptions of the message because they allow active processing of the information (central route). Alternatively, complex messages could receive little processing efforts by the viewer, but the fact that a voluntary disclosure of environmental information is presented could signal a positive cue on behalf of the company, making the ad more credible (peripheral route). Similarly, a credible piece of information, such as a third-party environmental certification logo, could be perceived simple by some respondents who directly link the information with the environmental performance of a company while others could perceive it with skepticism or little credibility.

After computing the model using LISREL 8.72 maximum likelihood method, the goodness of fit statistics were found satisfactory, indicating the overall acceptability of the structural model analyzed. The $\chi^2_{(806)} = 1{,}564.61$ (p=0.001), although significant, is of limited use as a stand-alone measure because it tends to gain excessive power in large samples (Bentler 1990). Therefore, the root mean square error of approximation (RMSEA) is thought to be a more robust measure of goodness of fit. RMSEA of the model estimated is 0.031, appropriately below the 0.050 suggested value by Brown and Cudeck (1993). A relative index that helps to explain the data compared to other possible models is the Normed Fit Index (NFI) which has a value of 0.97, also above the cut off 0.90 recommended by Bentler and Bonett (1980). Other indexes also suggest a good fit, including the Comparative Fit Index (CFI= 0.99); the Incremental Fit Index (IFI = 0.99), and the Relative Fit Index (RFI = 0.96).

In **Table 5** are presented the results of the reexamination of our hypotheses using latent variable structural equation techniques. The completely standardized solutions of the exogenous variables indicates that disaggregated environmental messages (TDED) significantly influence the attitudes toward the ad (0.08, t-value= 2.74) and its credibility (0.14, t-value= 4.11), providing evidence that including environmental messages in addition of functional ones are only effective when these messages are highly elaborated. Notice also that

respondents viewed similar the different messages along the complexity dimension.

Table 5: Estimated Structural Model standardized coefficients.

Specified relationship	Parameter	Estimate	t Value
TDF→ Complexity	γ_{18}	-0.02	**-0.03**
TDF→ Credibility	γ_{28}	0.05	**0.07**
TDF→ AAD	γ_{38}	-0.01	**-0.01**
TDFD→ Complexity	γ_{19}	0.03	**0.86**
TDFD→ Credibility	γ_{29}	0.01	**0.07**
TDFD→ AAD	γ_{39}	-0.01	**-0.05**
TDE→ Complexity	γ_{110}	0.02	**0.03**
TDE→ Credibility	γ_{210}	-0.05	**-0.07**
TDE→ AAD	γ_{310}	0.01	**0.01**
TDED→ Complexity	γ_{111}	-0.02	**-0.50**
TDED→ Credibility	γ_{211}	0.14	**4.11**
TDED→ AAD	γ_{311}	0.08	**2.74**
$\chi^2_{(806)}$ = 1,564.61 (p=0.001) Root Mean Square Error of Approximation (RMSEA) = 0.031 Normed Fit Index (NFI) = 0.97 Incremental Fit Index (IFI) = 0.99			

The completely standardized solutions for the endogenous variables are reported in **Table 6**. Supporting the model, the two mediating constructs had a significant effect on the communication effectiveness measures. Complexity is negatively related to AAD (-0.47, t-value=-14.48); however, it doesn't have any significant influence over ABR (-0.02; t-value= -0.63) and the ACO (0.03; t-value= 0.87). The negative influence on the AAD is congruent with previous research indicating that simpler ads have more favorable attitudes on individuals. This can also be partially explained by the fact that subjects had only one opportunity to view the ad and that it is a product with little appeal to generate some excitement.

If we now consider the effects on purchase intention (PI), we can see that complexity (COM) has a small but significant negative effect (-0.08; t-value = -2.54), nevertheless it is worth noticing the positive effect created by AAD, and credibility (CRE), and also by ABR, ACO which are not affected by COM.

These results are consistent with research suggesting that more explicit messages can elicit favorable ACO, especially in an age of global environmental consumerism where products are being evaluated not only on functional performance, quality and price, but also on the environmental responsibility of the manufacturer. As expected, credibility (CRE) had a positive influence on all the communication effectiveness measures, with a strong effect on the ACO. Although this could be an experimental artifact, because respondents were exposed just briefly to the brand, an alternative explanation is provided by the concept of *metaphor personification*, where several aspects of a company image and identify (e.g. reputation) are evaluated similarly to how people are evaluated (Davis et al. 2001). This is especially important in our context of socially-driven purchases, where buyers tend to evaluate the environmental performance of products (and its messages) as being directly linked toward the company itself, that is, the company personality could be easily assessed based on the responsibility perceptions of its products and processes.

Table 6: Estimated Structural Model standardized coefficients.

Specified relationship	Parameter	Estimate	t Value
Complexity → AAD	B_{31}	-0.47	**-14.48**
Complexity → ABR	B_{41}	-0.02	**-0.63**
Complexity → ACO	B_{51}	0.03	**0.87**
Complexity → PI	B_{61}	-0.08	**-2.54**
Credibility → AAD	β_{32}	0.30	**8.88**
Credibility → ABR	β_{42}	0.18	**5.01**
Credibility → ACO	β_{52}	0.72	**15.16**
Credibility → PI	β_{62}	0.18	**3.47**
AAD→ ABR	β_{43}	0.42	**9.25**
AAD→ ACO	β_{53}	0.17	**4.18**
AAD→ PI	β_{63}	0.28	**7.09**
ABR→ PI	β_{64}	0.15	**5.08**
ACO→ PI	β_{65}	0.33	**5.59**
$\chi^2_{(806)}$ = 1,564.61 (p=0.001) Root Mean Square Error of Approximation (RMSEA) = 0.031 Normed Fit Index (NFI) = 0.97 Incremental Fit Index (IFI) = 0.99			

When compared to a previous study in the B2C context (Molina 2007), although significant, ACO doesn't have such strong effect on PI. One might argue that this isn't the case because with this population the consumer-seller relationship is weaker as compared to the B2B buyers-supplier relationship; in addition, our final consumers were not predisposed to purchase the product based on the environmental performance dimension as is the case with our population of architects, which are mostly LEED certified.

The effect of professional experience

Based on the regression coefficients from **Table 4** and also results from our structural equation model (SEM), results suggest that the level of professional experience of our participant architects does not influence the complexity of how the ads are viewed. Nevertheless, based on our SEM analysis, more

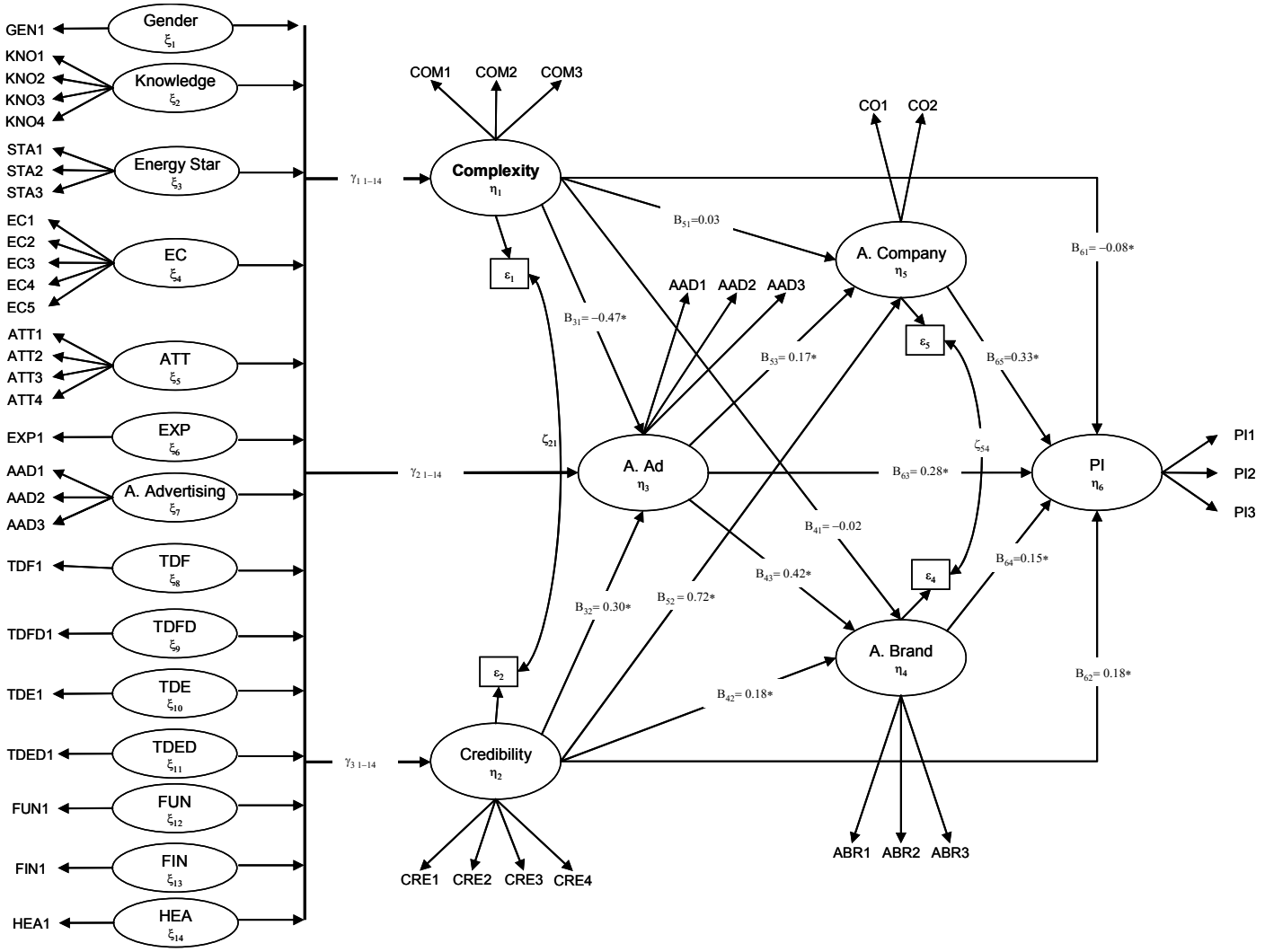

Figure 5. Structural Model: The role of information complexity and credibility on communication effectiveness.

experienced architects view ads across the board as less favorable (-0.08; t-value = -2.70) and less credible than novice architects (-0.19; t-value = -5.30). The results from the regression analysis not only confirm such effects but in addition, we see how they are true also for ACO and PI. However, veteran architects often have more knowledge about the persuasion process (i.e. beliefs about how persuasion occurs and what tactics are used) and simple disbelief toward the ad may be one way how they cope with the persuasive attempts (Obermiller et al. 2005).

CONCLUSIONS

Our main finding indicates that advertisements with non-functional environmental messages are more effective than those presenting functional product benefits, but only when they are substantiated with quantitative and disaggregated information [resulting from LCA studies]. Therefore, practitioners are to reconsider their common position that negative advertisement appeals are damageable to the overall marketing communication strategy. Simple messages are often required to gain market awareness and break through the noisy hypermedia marketplace; nevertheless, the overall purchase behavior is influenced by several other factors beyond the appealing of the ad itself. Our model suggests that credibility, to a high extent, compensates the effect of complexity on the attitude toward the ad, and in fact, it strongly influences in a positive manner all attitudinal variables and the intention to purchase the product. This is of particular importance today when brand image is considered an important asset to companies. With an increasing pressure from multiple stakeholders toward environmental and social responsible activities, the credibility gained with these less appealing ads might be in the long term a fruitful approach.

In the business-to-business market setting of this study, we found that attitudinal responses toward the brand (ABR) and the company (ACO) were not influenced by the perceived level of complexity (COM). One possible reason for this variation is that individuals are experienced in the product category, and in this particular case more familiar with "green building" and the product category's environmental attributes. In particular, it is evident that those respondents with more experienced present less favorable attitudes toward the ad, the brand, the company, and credibility as compared to novices. However, all they view the complexity of the ad in a similar manner. For companies thus, it's important to develop specific communications devoted to these market segments. It appears that when companies intend to communicate non-functional environmental messages, the inclusion of disaggregated LCA information is appropriate. Buyers and consumers have indicated in numerous occasions that environmental messages need to be substantiated in order for claims to be reliable. This hasn't been an easy task for organizations and strategic thinking is required to make this integration into the marketing planning and execution effective.

When ads with only functional product messages were analyzed, we found that disaggregating the message did not provided additional improvement on their communication effectiveness, hence, it is probable that without competitive product comparisons, simpler ads with functional product benefits will be preferable.

As LCA information becomes more readily available, this research provides the first steps toward identifying the dimensions by which environmental communications are improved. This work provides the first steps in linking investments in LCA with marketing communications, identifying directions by which environmental communications can be improved. While attention in LCA has increased in the past years, most research on this topic has been focused on the improvements of LCA tools and methodologies, and there is little understanding of how LCA information is processed and used by companies in the development of business strategies and marketing communication activities. One should be mindful of the hypothetical nature of this experiment. Although in our experimental setting respondents could face as many distractions as in an actual purchase setting, they still did not face any budget constraints. Furthermore, a within-subjects experimental

design would be an alternative approach in which the main effect of most advertisements designs could be strongly tested given the higher control of differences across individuals. With the inclusion of multiple control variables we attempted to control such differences, yet, extraneous variation is always a constraint. Our recommendation for further analysis is to test at the individual level two or maximum three specific ads across one factor (e.g. the format, the content, etc.).

Although we put substantive effort on the development of several distinct advertisements, it is valuable of further exploration these phenomena in other communication media. Certainly advertising receives high public attention, and the effects on product and corporate credibility can be strong, but the exploration of similar communications is worth further exploration.

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Appendix 1. Non response bias test, comparison of means between early and late responses for key variables in the study.

Variable	Mean difference	Std. Error difference	p-value [a]
Complexity (COM)	.00884	.0881	.918
Credibility (CRE)	.01769	.0624	.778
A. towards the Ad (AAD)	.10175	.0761	.197
A. towards the Company (ACO)	-.01473	.0667	.830
A. towards the Brand (ABR)	.01743	.0431	.698
Purchase Intention (PI)	.04571	.0671	.511

[a] p-value ≤ 0.05 indicate that the means between early and late responses are significantly different at 95 percent confidence level.

Appendix 2. Rotated component matrix for Attitude towards the company (ACO) with varimax rotation.

	Component [a]	
	(1) "Honesty/ Trustworthiness"	***(2) "Expertise"***
This company has a great amount of experience	**.876**	.180
This company is skilled in what it does	**.846**	.311
This company has great expertise	**.865**	.300
This company does not have much experience	**.672**	.243
I trust this company	.324	**.780**
This company makes truthful claims	.237	**.851**
This company is honest	.205	**.852**
I do not believe what this company tells me	.244	**.696**

[a] Extraction Method: Principal Component Analysis. Rotation converged in 3 iterations using Varimax with Kaiser Normalization.

Appendix 3. Item correlation matrix.

		Mean	S.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
1	GEN	1.36	0.479	1.00																																												
2	KNO1	5.40	1.197	-0.27	1.00																																											
3	KNO2	5.19	1.173	-0.30	0.82	1.00																																										
4	KNO3	5.18	0.989	-0.29	0.77	0.82	1.00																																									
5	STA1	5.59	0.854	-0.05	0.36	0.34	0.31	1.00																																								
6	STA2	5.42	0.804	-0.06	0.38	0.39	0.38	0.81	1.00																																							
7	STA3	5.31	0.780	-0.08	0.35	0.37	0.41	0.75	0.85	1.00																																						
8	EC1	4.39	1.492	0.13	0.05	0.01	0.02	0.20	0.18	0.17	1.00																																					
9	EC2	5.26	1.303	0.14	0.02	0.01	0.03	0.14	0.13	0.12	0.53	1.00																																				
10	EC3	5.82	1.175	0.13	-0.01	-0.07	-0.02	0.13	0.10	0.11	0.49	0.63	1.00																																			
11	EC4	5.27	1.523	0.11	-0.01	-0.06	-0.02	0.12	0.09	0.09	0.48	0.60	0.68	1.00																																		
12	EC5	5.73	1.118	0.02	0.08	0.03	0.06	0.10	0.10	0.09	0.42	0.41	0.48	0.46	1.00																																	
13	ATT1	5.55	1.144	-0.05	0.29	0.24	0.23	0.20	0.19	0.16	0.11	0.17	0.19	0.14	0.16	1.00																																
14	ATT2	5.31	1.391	-0.05	0.29	0.24	0.23	0.18	0.18	0.15	0.09	0.14	0.15	0.11	0.12	0.85	1.00																															
15	ATT3	5.19	1.345	-0.06	0.27	0.22	0.21	0.15	0.15	0.14	0.06	0.11	0.12	0.08	0.11	0.79	0.83	1.00																														
16	ATT4	5.07	1.392	-0.02	0.23	0.20	0.19	0.15	0.12	0.11	0.09	0.14	0.15	0.14	0.12	0.67	0.73	0.71	1.00																													
17	EXP	15.35	10.47	-0.31	0.34	0.45	0.34	0.15	0.19	0.18	-0.05	-0.07	-0.17	-0.09	0.05	0.03	0.04	0.06	0.04	1.00																												
18	ADV1	3.42	1.078	-0.01	0.02	0.03	0.01	-0.02	-0.02	-0.03	-0.07	-0.06	-0.08	-0.03	-0.03	0.09	0.12	0.13	0.10	0.06	1.00																											
19	ADV2	3.13	1.053	-0.04	0.02	0.02	-0.01	-0.03	-0.04	-0.04	-0.08	-0.08	-0.11	-0.07	-0.07	0.09	0.09	0.12	0.10	0.05	0.78	1.00																										
20	ADV3	3.01	1.060	-0.04	0.02	0.01	0.00	-0.01	0.01	-0.02	-0.07	-0.06	-0.13	-0.06	-0.07	0.07	0.07	0.09	0.07	0.02	0.72	0.81	1.00																									
21	TDF	0.26	0.441	-0.02	0.00	-0.02	0.02	0.04	0.03	0.03	0.02	0.00	0.04	0.03	0.05	0.01	0.00	-0.01	-0.04	-0.02	0.06	0.04	0.05	1.00																								
22	TDFD	0.12	0.329	-0.05	-0.01	-0.01	0.01	0.01	-0.01	-0.02	-0.01	-0.03	-0.01	0.01	0.01	-0.03	-0.04	-0.02	-0.03	-0.01	0.07	0.04	0.05	0.63	1.00																							
23	TDE	0.74	0.441	0.02	0.00	0.02	-0.02	-0.04	-0.03	-0.03	-0.02	0.00	-0.04	-0.03	-0.05	-0.01	0.00	0.01	0.04	0.02	-0.06	-0.04	-0.05	-1.00	-0.63	1.00																					
24	TDED	0.36	0.481	-0.10	0.06	0.04	0.04	-0.05	-0.03	-0.02	0.00	0.01	-0.02	0.00	-0.03	0.02	-0.01	0.02	0.03	0.02	0.00	0.03	0.02	-0.45	-0.28	0.45	1.00																				
25	FUN	0.52	0.500	0.00	0.02	-0.02	0.03	0.03	0.01	0.02	-0.03	0.01	0.01	0.00	-0.02	0.06	0.04	0.03	-0.02	-0.03	0.04	0.03	0.01	0.58	0.36	-0.58	-0.26	1.00																			
26	FIN	0.24	0.427	0.06	-0.02	0.01	-0.01	-0.04	-0.02	-0.02	0.07	0.06	0.05	0.05	0.00	-0.03	0.00	0.00	0.04	0.02	-0.01	-0.02	0.01	-0.34	-0.21	0.34	0.18	-0.58	1.00																		
27	HEA	0.24	0.428	-0.06	-0.01	0.01	-0.02	0.01	0.01	0.00	-0.03	-0.07	-0.06	-0.05	0.03	-0.04	-0.05	-0.03	-0.01	0.02	-0.04	-0.01	-0.02	-0.34	-0.21	0.34	0.12	-0.59	-0.32	1.00																
28	COM1	3.26	1.489	0.03	-0.06	-0.02	-0.04	-0.03	-0.02	-0.01	-0.01	-0.03	-0.04	0.01	-0.01	-0.29	-0.30	-0.26	-0.09	0.03	-0.16	-0.12	-0.13	-0.05	0.00	0.05	0.00	-0.11	0.05	0.08	1.00															
29	COM2	3.31	1.456	0.01	-0.05	-0.01	-0.04	-0.02	-0.01	-0.01	-0.01	-0.03	-0.03	0.00	-0.01	-0.28	-0.30	-0.25	-0.11	0.04	-0.14	-0.10	-0.12	-0.06	-0.02	0.06	0.00	-0.09	0.03	0.07	0.86	1.00														
30	COM3	3.38	1.484	0.04	-0.07	-0.02	-0.05	0.02	0.01	0.00	0.03	0.04	-0.01	0.07	0.00	-0.22	-0.25	-0.20	-0.08	0.03	-0.03	-0.03	-0.01	-0.10	-0.04	0.10	0.14	-0.11	0.08	0.05	0.54	0.57	1.00													
31	CRE1	4.19	0.952	0.07	-0.14	-0.12	-0.10	-0.03	-0.05	-0.02	0.04	0.05	0.05	0.06	0.00	0.01	-0.04	-0.02	-0.04	-0.19	0.17	0.19	0.22	0.06	0.04	-0.06	0.07	0.03	-0.02	-0.02	-0.18	-0.18	-0.04	1.00												
32	CRE2	4.32	1.175	0.09	-0.14	-0.14	-0.12	-0.03	-0.04	-0.03	0.02	0.01	0.04	0.04	-0.01	0.00	-0.06	-0.03	-0.06	-0.20	0.28	0.29	0.31	0.05	0.03	-0.05	0.09	0.03	-0.01	-0.03	-0.24	-0.21	-0.03	0.73	1.00										
33	CRE3	4.54	1.115	0.01	-0.05	-0.05	-0.04	-0.03	-0.02	-0.01	-0.01	0.03	0.04	0.03	0.01	0.07	0.03	0.07	0.04	-0.07	0.27	0.28	0.28	0.01	0.01	-0.01	0.11	-0.01	0.00	0.01	-0.24	-0.23	-0.05	0.57	0.68	1.00									
34	CRE4	4.78	1.166	0.03	-0.10	-0.11	-0.10	-0.04	-0.07	-0.07	-0.07	-0.01	-0.01	0.01	-0.04	0.05	0.01	0.03	-0.02	-0.13	0.28	0.27	0.26	0.09	0.06	-0.09	0.02	0.08	-0.05	-0.04	-0.20	-0.17	-0.09	0.46	0.56	0.53	1.00								
35	AAD1	4.96	1.199	-0.04	0.05	0.03	0.04	0.02	0.00	-0.01	0.01	0.03	0.03	0.04	-0.01	0.27	0.25	0.27	0.17	-0.07	0.23	0.23	0.21	-0.04	0.00	0.04	0.15	0.02	0.03	-0.05	-0.47	-0.42	-0.13	0.29	0.35	0.40	0.26	1.00							
36	AAD2	4.42	1.290	0.00	0.05	0.03	0.02	0.01	0.02	0.00	0.01	0.02	0.02	0.01	-0.02	0.21	0.22	0.23	0.10	-0.09	0.25	0.23	0.24	0.01	-0.01	-0.01	0.11	0.04	0.01	-0.05	-0.53	-0.52	-0.22	0.28	0.37	0.40	0.31	0.75	1.00						
37	AAD3	4.57	1.307	-0.03	0.01	-0.02	0.02	-0.02	-0.05	-0.05	-0.03	0.01	0.03	0.00	-0.03	0.17	0.18	0.19	0.14	-0.15	0.15	0.14	0.16	0.04	0.00	-0.04	0.01	0.04	-0.01	-0.03	-0.45	-0.44	-0.18	0.22	0.26	0.37	0.24	0.61	0.68	1.00					
38	ABR1	4.23	1.025	-0.02	-0.01	-0.04	-0.05	-0.01	-0.01	0.01	-0.04	-0.04	-0.01	-0.04	-0.01	0.11	0.09	0.13	0.08	-0.09	0.17	0.18	0.21	0.01	-0.02	-0.01	0.01	0.01	-0.01	0.00	-0.27	-0.28	-0.11	0.20	0.25	0.30	0.21	0.38	0.40	0.49	1.00				
39	ABR2	4.27	1.017	0.00	-0.01	-0.05	-0.05	0.02	0.01	0.02	-0.03	-0.03	0.00	-0.04	-0.01	0.13	0.10	0.14	0.06	-0.11	0.18	0.20	0.22	0.03	-0.01	-0.03	0.03	0.04	-0.03	-0.02	-0.30	-0.29	-0.12	0.25	0.30	0.33	0.27	0.39	0.42	0.43	0.83	1.00			
40	ABR3	4.26	1.040	0.00	-0.03	-0.04	-0.05	0.01	-0.01	0.00	-0.02	-0.03	0.01	-0.03	0.01	0.11	0.09	0.12	0.07	-0.11	0.19	0.20	0.22	0.01	-0.02	-0.01	0.03	0.02	-0.01	-0.01	-0.29	-0.28	-0.12	0.27	0.32	0.34	0.28	0.40	0.42	0.43	0.81	0.91	1.00		
41	ACO1	4.00	0.719	0.09	-0.16	-0.17	-0.16	-0.06	-0.06	-0.06	-0.01	0.03	0.04	-0.01	-0.02	-0.03	-0.05	-0.05	-0.06	-0.18	0.19	0.21	0.23	0.09	0.06	-0.09	0.01	0.03	-0.06	0.03	-0.17	-0.16	-0.05	0.34	0.40	0.36	0.30	0.29	0.35	0.27	0.28	0.36	0.38	1.00		
42	ACO2	4.12	0.701	0.03	-0.09	-0.11	-0.09	-0.02	0.00	0.00	-0.01	0.04	0.03	0.00	0.00	0.01	-0.03	-0.01	-0.04	-0.18	0.27	0.30	0.31	0.05	0.07	-0.05	0.07	0.04	-0.05	0.01	-0.24	-0.21	-0.09	0.56	0.61	0.58	0.51	0.35	0.39	0.33	0.32	0.40	0.41	0.58	1.00	
43	PI1	4.08	1.218	0.01	-0.01	-0.02	-0.02	0.04	0.02	0.02	0.04	0.05	0.07	0.06	0.01	0.17	0.14	0.15	0.06	-0.17	0.25	0.25	0.25	0.00	0.00	0.00	0.12	0.03	0.02	-0.05	-0.39	-0.37	-0.14	0.40	0.51	0.45	0.41	0.49	0.53	0.41	0.38	0.44	0.43	0.42	0.53	1.00
44	PI2	4.32	1.027	-0.01	-0.01	-0.05	-0.02	0.02	0.01	-0.01	0.03	0.07	0.08	0.04	0.00	0.16	0.12	0.12	0.06	-0.15	0.26	0.25	0.26	-0.03	0.01	0.03	0.13	0.02	0.02	-0.04	-0.39	-0.36	-0.15	0.44	0.52	0.47	0.43	0.51	0.52	0.43	0.42	0.50	0.50	0.47	0.56	0.78	1.00	
45	PI3	4.60	1.011	-0.02	0.01	-0.01	0.02	0.04	0.00	-0.03	0.01	0.07	0.07	0.04	0.03	0.14	0.12	0.10	0.06	-0.15	0.22	0.25	0.25	0.03	0.05	-0.03	0.08	0.04	0.03	-0.07	-0.27	-0.26	-0.12	0.39	0.43	0.40	0.37	0.40	0.41	0.34	0.31	0.39	0.41	0.39	0.49	0.67	0.73	1.00

[a] **Note**: GEN= Gender; KNO= Product knowledge; STA= Familiarity with the Energy Star® Program; EC = Environmental concern; ATT= Attention devoted by the respondent to processing the ad presented; EXP= Years of professional experience; ADV = Attitude towards advertising; TDF= Theme disclosure functional; TDFD= Theme disclosure functional disaggregated; TDE= Theme disclosure environmental; TDED= Theme disclosure environmental disaggregated; FUN= Private disclosure functional; FIN= Private disclosure financial; HEA= Private disclosure health; COM = Complexity; CRE = Credibility; AAD = Attitude towards the ad; ACO = Attitude towards the company; ABR = Attitude towards the brand; PI = Purchase intention.

Appendix 4: Electronic instrument used in the B2B study.

Dear USGBC member,

In partnership with the University of Minnesota, we are conducting a short online experiment to assess your perceptions on several novel concepts on how advertisements are presented.

We realize your time is valuable, so this experiment has been designed to take no more than 10 minutes to complete. You have been selected in a scientific fashion, so even if you feel your contribution would be small, your answers are very important to the accuracy and success of this research. Your participation is voluntary and all responses will be kept confidential. You may also forward this email to other personnel within your organization as you consider appropriate.

This experiment is part of Sergio Molina's doctoral dissertation, thus, if you have any additional questions regarding this study, please contact him directly at sergiomolina@umn.edu; (612) 624-3223 or FAX (312) 625-6286. You may also contact his academic advisor: Dr. Timothy M. Smith, timsmith@umn.edu, (612) 624-6755.

As a token of our appreciation, we'll provide a summary of results early next year. To participate in this experiment please click on the hyperlink below at any time.

[SurveyLink]

Thank you for your time and collaboration. We are very grateful for your help.

Sincerely,

Tom Dietsche

LEED Program Manager

U.S. Green Building Council, 1015 18th St.NW, Suite 508, Washington D.C. 20036

Phone: 202-828-1136 (reception: 828-7422) Fax: 202-828-7722

www.usgbc.org

www.greenbuildexpo.org

PAGE 1

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Thank you very much for participating in this research study; you have been randomly selected from a group of USGBC members. Our main objective is to t

STATEMENT OF CONSENT

As part of the University of Minnesota policies the following explains some important aspects in relation to the procedures of this research.

A. NO RISKS exist in this study, please provide only information you feel comfortable sharing.

B. The records of this study will be kept PRIVATE. In any report we might publish, we will not include any information that will make it possible to identify yo

C. Only members of this research team will have access to the records.

D. Your participation is VOLUNTARY. Your decision of whether or not to participate in this study will not affect in any way your current or future relations wit

If you have questions or problems, please contact Sergio Molina (612-624-3223; sergiomolina@umn.edu), or Dr. Timothy M. Smith (612-624-6755; timsmit

Feel free to print and retain this page for your records so that you may contact us if you have any questions.

I have read the above information and agree to participate in this study.

YES NO

UNIVERSITY OF MINNESOTA

GENERAL INSTRUCTIONS

On the following page you will see a representation of a print advertisement. Please look the ad at the pace you would as when reading your favorite magazine.

IMPORTANT:

1. This will be your only opportunity to see the ad.

2. Push F11 now in your keyboard for FULL SCREEN option.

3. Remember to hit "Continue" at the bottom of each page.

PAGE 3

The ad was presented here.

PAGE 4

UNIVERSITY OF MINNESOTA

Please rate your level of agreement with the following statements as they pertain to the ADVERTISEMENT presented.

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7- Strongly Disagree
The ad was favorable							
The ad was good							
The ad was pleasant							

Please rate your level of agreement with the COMPLEXITY of the advertisement presented.

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7- Strongly Disagree
The ad was simple to understand							
The ad was easy to follow							
The ad was complicated							

Please rate your level of agreement with the CREDIBILITY of the advertisement presented.

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7- Strongly Disagree
The claims in the ad are true							
I believe the claims in the ad							
The ad is sincere							
I think the ad is dishonest							

Survey 23% Complete

PAGE 5

Please rate your level of agreement with the following categories about the BRAND "Shield Versatex" (not the advertisement).

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7- Strongly Disagree
Pleasant	○	○	○	○	○	○	○
Good	○	○	○	○	○	○	○
Favorable	○	○	○	○	○	○	○

Please rate your level of agreement with the following items that help describe the COMPANY of the advertisement presented.

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7- Strongly Disagree
This company has a great amount of experience	○	○	○	○	○	○	○
This company is skilled in what it does	○	○	○	○	○	○	○
This company has great expertise	○	○	○	○	○	○	○
This company does not have much experience	○	○	○	○	○	○	○
I trust this company	○	○	○	○	○	○	○

This company makes truthful claims	○	○	○	○	○	○	○
This company is honest	○	○	○	○	○	○	○
I do not believe what this company tells me	○	○	○	○	○	○	○

If you were to buy or specify this product based on the advertisement presented, please rate your INTENTION.

	A	B	C
My Intention to buy or specify this product is:			

Survey 41% Complete

PAGE 6

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Based on the advertisement presented, please indicate your level of agreement with the following statements as they pertain to the FUNCTIONAL PERFORMANCE of Shield Versatex.

1- Strongly	2-Agree	3- Somewhat	4-	5- Somewhat	6-	7- Strongly

	Agree		Agree	Neutral	Disagree	Disagree	Disagree
It is a high performance product							
It lacks important benefits							
Likely to be of high quality							
A product I would try or recommend							

Please rate the following statement in regards to INSULATION PRODUCTS.

	A	B	C
I consider myself:			

What is your opinion of SHIELD VERSATEX Insulation in the following attributes?

	Your Opinion
Product functional/quality performance	
Environmental performance	
Overall performance	

Please rate the following statement in regards to the ENERGY STAR program.

	A	B	C
I consider myself:			

Survey 59% Complete

UNIVERSITY OF MINNESOTA

Please indicate your level of agreement with the following statements as they pertain to your general environmental intentions.

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7- Strongly Disagree
I would participate in a protest against a company that is harming the environment	○	○	○	○	○	○	○
I would contribute money to environmental protection organizations	○	○	○	○	○	○	○

I would sign a petition to support stricter environmental laws	○	○	○	○	○	○	○
I would pay higher income taxes if I knew the money would be spent to protect the environment	○	○	○	○	○	○	○
I would stop buying products from companies guilty of polluting the environment even if it is inconvenient to do so	○	○	○	○	○	○	○

Please rate your level of agreement with the following items as they pertain to the ad presented.

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7- Strongly Disagree

I paid attention to the content of the ad							
I carefully read the content of the ad							
When I saw the ad, I concentrated on its content							
I expended effort on the content of this ad							

Survey 76% Complete

PAGE 8

UNIVERSITY OF MINNESOTA

Please rate your level of agreement with the following statements about ADVERTISING IN GENERAL:

	1- Strongly Agree	2-Agree	3- Somewhat Agree	4- Neutral	5- Somewhat Disagree	6- Disagree	7-- Strongly Disagree
We can depend on getting the truth in most advertising							
Advertising's aim is to inform the consumer							
I believe advertising is informative							
Advertising is generally truthful							
Advertising is a reliable source of information about the quality and performance of products							
Advertising is truth well told							

Advertising presents a true picture of the product being advertised							
I feel I've been accurately informed after viewing most advertisements							
Most advertising provides consumers with essential information							

Survey 91% Complete

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UNIVERSITY OF MINNESOTA

Finally, we would like to ask you some questions about YOURSELF and YOUR COMPANY. As indicated before, all answers are held in strict confidence in accordance with University and Federal Policy.

What is your title or position?

How many years of professional experience do you have?

How many years have you been working at the current firm?

Are you a LEED Accredited Professional?

Is English your native language?

Could you please indicate your gender?

Which of the following categories best describes your firm's TOP THREE line of business.

	First	Second	Third
My firm's top three line of business are:			

What is your organization's annual gross revenue?

Could you please roughly indicate the NUMBER of EMPLOYEES in your organization according to the following categories?

Licensed architects:

Licensed engineers:

Technical staff:

Other staff:

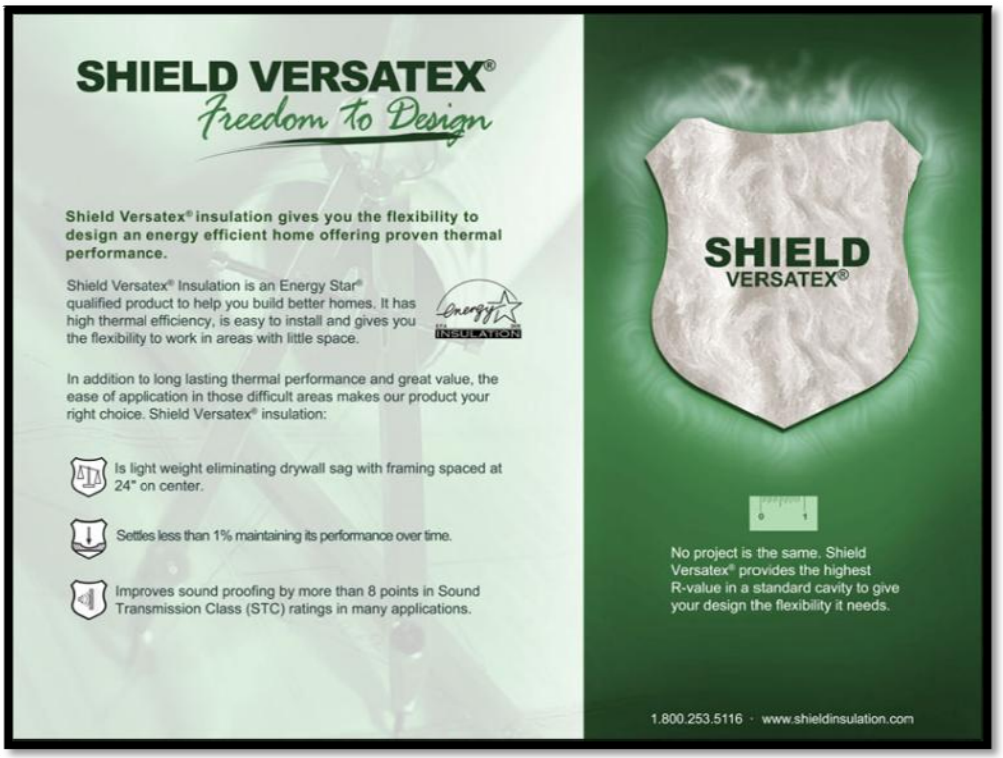
TOTAL:

If you like to receive a REPORT of this research early next year, please indicate your e-mail here:

If you like to provide further comments, please do so here: _____

Survey 100% COMPLETE. Thank you very much for your feedback!

Appendix 5. Advertisements tested in the business-to- business experiment described in Chapter III.




SHIELD VERSATEX®
Freedom to Design
Shield Versatex® insulation gives you the flexibility to design an energy efficient home offering proven thermal performance.
Shield Versatex® Insulation is an Energy Star® qualified product, and requires the lowest amount of energy through its whole life cycle as compared to other insulation materials.
SHIELD
VERSATEX®
No project is the same. Shield Versatex® provides the highest R-value in a standard cavity to give your design the flexibility it needs.
1.800.253.5116 · www.shieldinsulation.com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Shield Versatex® Insulation is an Energy Star® qualified product, and requires the lowest amount of energy through its whole life cycle as compared to other insulation materials.
Did you know the average house produces twice as much greenhouse gases as the average car? If every home was an energy efficient home like those insulated with Shield Versatex® with R-15 insulation in the walls and R-49 in the attic Americans would see:
Reduction of greenhouse gases by up to 17 billion pounds
A savings of 12 BTUs each year for every BTU consumed during the production of the insulation
The elimination of the need for 600 new power plants
SHIELD
VERSATEX®
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SHIELD
VERSATEX®
Energy efficiency improvements with Shield Versatex® mean an average savings of 20% of heating and cooling cost a year for your valuable customers.
1.800.253.5116 · www.shieldinsulation.com


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SHIELD
VERSATEX®
Energy efficiency improvements with Shield Versatex® mean an average savings of 20% of heating and cooling cost a year for your valuable customers.
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SHIELD
VERSATEX®
Recent studies show that fewer emissions due to increased energy savings with insulation, will translate in over 6,000 fewer asthma attacks in the U.S. every year.
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