

Signage as Marketing Communication: Research Perspectives and Next Steps

James J. Kellaris, Ph.D.
James S. Womack / Gemini Chair
University of Cincinnati

ABSTRACT

On-premise signage is among the oldest and most important forms of marketing communication. As visual branding it confers multiple benefits to commerce, consumers, and communities. Yet these benefits and how they are conferred are often misunderstood. Drawing from published research findings and current theory in marketing psychology, this presentation will summarize the current state of knowledge in signage research, including what we know conclusively, what we might know by analogy from allied fields, what we don't know, and what this implies for future research.

Visual acuity research suggests principles for determining how large a sign should be to be legible from a given distance, at a given speed of travel. Such principles provide an objective basis for creating and regulating signage. However, there is more to sign communication than mere visibility. Research on processing fluency, for example, suggests that the ease or difficulty with which visual information is processed can influence attitudes toward that information. If an object (word or symbol) is legible, but difficult to read, it may be evaluated negatively due to the negative valence cast by effortful processing. By extension, if a sign is visible, yet difficult to process, there may be unintended negative consequences for the brand it represents.

Research can help inform decisions regarding the design, use, and regulation of signage that are fair and beneficial to all parties. The presentation concludes with an overview of research efforts under way at the University of Cincinnati.

INTRODUCTION

On-premises signage is among the oldest and most fundamental forms of marketing communication. Archeological evidence shows that signage was used as a primary means of marketing communication by merchants in antiquity. Examples from Babylon, Egypt, Athens, Rome, Herculaneum, Pompeii, and Carthage indicate extensive usage of commercial signage to identify shops, advertise wares and prices, and distinguish merchants from competitors (Presbrey 1929). Signboards were commonly hung outside shop doors in ancient Athens. In Rome, it was customary to smooth and whiten a place on the exterior wall of houses for written or carved inscriptions known in Latin as "albums." House albums typically depicted the profession of the resident or products/services they offered. A legacy of this practice is seen here in the lintel carved over the door of my Great-grandfather's house in the village of Klimenti, near Corinth, Greece.



During the middle-ages in Europe, each guild had a distinctive sign that identified members of a trade. (Interestingly, the “sign writers’ guild” had a distinctive guild sign composed largely of blank signs.) In colonial America, as literacy increased, signage began to use a combination of visual symbols and text. Today signs continue to play an important role in marketing communication. As this audience is well aware, virtually every bricks and mortar establishment is identified by on-premises signage; and, although the U.S. economy is currently in recession, the \$49.5 billion domestic sign industry continues to grow in sales and employment (ISA 2009).

Signage is important to marketing because of the benefits it confers as a communication medium (Bitner 1992). As visual branding it confers benefits to commerce, consumers, and communities (Signline 2002a, b). Yet these benefits and how they are conferred are not fully understood within the field of marketing; nor are they adequately represented in the marketing literature.

For customers, signage facilitates identification, brand recognition, and conveys useful information such as way-finding and rules of behavior. It can even change perceptions of the environment (e.g., crowding) and reduce stress (Wener and Kaminoff 1982). For business owners, signage is among the most important marketing tool available, because it is a highly cost-effective way to generate attention and attract traffic (Signline 2002b). In recognition of the marketing value of signage, some organizations have allocated more to permanent media than to advertising (Shennan 1986). For communities, signage has an indirect benefit in the form of tax revenues generated through businesses. Commercial signage is also an important part of a community’s way-finding system, providing useful landmarks and visual cues to facilitate navigation and traffic flow (Signline 2002a).

Signage plays multiple roles in marketing communication: identification, way-finding, branding (Bitner 1992, Calori 2007). Moreover, signage may serve as an inferential cue and basis for thin-slice judgments about the businesses they represent (Olson and Jacoby 1973). Applying principles from other domains of visual communication by analogy allows one to make this conjecture (e.g., Nasar 1987). This claim was recently assessed in a series of surveys conducted at the University of Cincinnati. Across two surveys of over two-hundred business students, 79% agreed with the statement “I can often infer the quality

of a business from its signage.” Indeed, practical wisdom from the sign industry holds that a sign is to a business what a handshake is to a sales call (Taylor *et al.* 2005), i.e., a first impression and instant disclosure of personality.

It is likely that signage communicates through both conscious and non-conscious processes. Indeed signage may not only convey information and impressions – it may even *persuade* through non-conscious processing of design attributes. Consider, by analogy, the work of Henderson and Cote (1998) on logos. They demonstrate that design attributes such as the degree of naturalness (representative, organic designs), harmony (balance, symmetry), and elaborateness (complexity, depth) can influence outcomes such as true and false recognition, affect, and shared meanings. Design attributes that facilitate processing (e.g., easy brand recognition) may also evoke other benefits of processing fluency, such as an object (brand, store, business) seeming more familiar and being better liked (Janiszewski and Meyvis 2001).

Despite the importance of signage as a marketing communication medium and branding tool, to date the topic has been largely ignored in marketing courses and the textbooks that inform them. Among top-selling introductory marketing textbooks (e.g., Kerin 3rd edition *Core Marketing*, McGraw-Hill; Lamb 2nd edition *Marketing*, Cengage; Armstrong/Kotler 9th edition *Marketing*, Pearson; Solomon 5th edition *Marketing*, Pearson; and Boone 13th edition *Marketing*, Cengage), none offer significant coverage of signage as a form of marketing communication. Most offer no coverage of the topic at all. This would seem to be a significant gap. If we are not fully informed on how signage communicates – that is, how it is processed by viewers – how can we create, use, and regulate it?

The good news, however, is that this gap is being addressed by efforts at the University of Cincinnati. Among these efforts are the research and educational activities of the James S. Womach / Gemini Corporation Chair, which I have the honor to occupy.

A SMALL FIRST STEP

One small step toward addressing the dearth of signage knowledge within the marketing field involved conducting a series of surveys of business students to assess their attitudes toward and beliefs about commercial, on-premises signage. A questionnaire was administered to undergraduates enrolled in an Introduction to Marketing class at the University of Cincinnati. The questionnaire contained 20 statements about signage, generated from multiple sources (including both industry and anti-signage sources). Each statement was followed by a ten-point agreement scale. The analysis compiled descriptive statistics for each attitude/belief statement.

Results (see Table) indicate that although business students have not devoted much thought to the topic of commercial signage, they recognize its importance as a marketing communication tool. Additionally, there is evidence of some negative beliefs and misunderstandings. For example, 17% report believing that signage causes traffic accidents, 20.8% believe that signs along the highway are “eyesores,” 25.8% believe that

illuminated signs are an environmental threat, and 32.1% believe that electric signs are a waste of electricity. Roughly a third of the students report that there is no difference between signs and billboard ads (a common misunderstanding). Additionally, students appear to hold fairly strong beliefs in the rights of business owners to use signs and in the protection of signage as freedom of speech.

To gather additional evidence regarding students’ attitudes toward and beliefs about commercial signage, and to examine the impact of educational intervention on such attitudes and beliefs, a second survey was conducted with 200 students enrolled in yet another introductory marketing class at the University of Cincinnati. The class was split randomly into two groups. Half were asked to fill out the questionnaire immediately prior to hearing a lecture on signage; half were asked to fill out the questionnaire shortly after hearing the lecture.

Again, concerning prior thought about signage issues, 58% of participants tended to agree that “I have never really thought much about signage before now.” Most reported a belief that they could infer the quality of a business from its signage; and a majority (55%) report that they avoid going in to business establishments that have poor quality signage.

TABLE – Descriptive Statistics for Business Student Surveys

	Means ¹	
	Study 1	Study 2

1. I have never thought much about signage before now.	5.47	6.11
2. My attitude toward commercial signage is generally negative.	4.12	3.90
3. Signage is important form of marketing communication.	8.40	8.53
4. Only business owners benefit from signs.	2.89	3.30
5. Signage confers multiple benefits to customers.	7.36	7.43
6. The economic impact of signage is significant.	7.02	7.73
7. I can often infer quality of a business from its signage.	6.68	7.11
8. I avoid businesses with low quality signage.	5.72	5.72
9. Commercial signage causes a lot of traffic accidents.	3.68	4.20
10. Signs along highways and roads are eyesores.	4.15	4.52
11. Illuminated signs are environmental threat.	4.40	4.08
12. Electronic signs are a waste of electricity.	4.38	4.66
13. Business owners have right to advertise using signage.	8.64	8.67
14. Signage should be protected as freedom of speech, as long as it does not violate standards of decency.	8.24	8.16
15. Poorly placed or poor quality signage can lower surrounding property values.	7.49	7.36
16. Well made/placed signs can enhance property values.	6.08	7.00
17. There is no real difference between a billboard ad and a sign.	4.71	4.38
18. Signage can identify and inform, but not persuade.	3.57	3.76
19. A sign is to a business what a handshake is to salesman.	5.83	6.70
20. Signage should be strictly regulated by local ordinances.	5.83	5.46

¹ Ten-point scale, 1 = strongly disagree, 10 = strongly agree.

As in the previous survey, there is evidence of negative beliefs. Among those in the “before” group, 24.3% believe that signage causes traffic accidents, 21.4% believe that signs along the highway are “eyesores,” 21.4% believe that illuminated signs are an environmental threat, and 38.6% believe that electric signs are a waste of electricity. A significant proportion of students (28.6%) reported that there is no difference between signs and billboard ads.

Consistent with the prior survey, a clear majority of students (80%) denied holding generally negative attitudes towards commercial signage; however, results differed as a function of hearing a lecture about

signage. The mean agreement with the statement “My attitude toward commercial signage is generally negative” was 4.36 among those queried before the lecture versus 3.53 (i.e., stronger disagreement) among those queried after the lecture. Other differences are also noted. The importance of signage as a form of marketing communication became more salient as result of exposure to a lecture (item 3). Similarly, the benefits (item 5) and economic impact of signage (item 6) also became more apparent. Similar positive changes can also be seen regarding the protection of signage as freedom of speech, the impact of signage on property values, and the role of signage in creating an initial positive impression.

These surveys provide initial documentation of the attitudes and beliefs of business students regarding commercial signage as a marketing communication tool. The findings indicate that despite high levels of exposure to signage in daily life and the prominent roles signage plays in marketing, students have simply not devoted much thought to the topic. This may seem ironic, but should not be surprising. Marketing textbooks offer scant (or no) coverage of the topic. Moreover, stimuli that are ubiquitous are often “filtered out” (to avoid information overload) or simply taken for granted as features of the environment that do not warrant conscious, effortful processing. For example, despite its importance, we do not devote much thought to the air we breathe. Similarly, even students of marketing and business are prone to disregard an important communication device on which they depend as consumers.

Students’ attitudes and beliefs do not appear to be so strongly held that they cannot be changed through educational intervention. After hearing a basic lecture on signage, attitudes became more positive, as did beliefs in the importance, benefits, and economic impact of signage. Hence provisionally we might conclude that education can effectively shape attitudes/beliefs and correct misperceptions regarding signage. Merely raising awareness of issues seems to effect positive changes toward this form of marketing.

These surveys are merely first steps toward addressing the general dearth of signage knowledge within the marketing field. A second step involved conducting reviews of the literature on signage – both within marketing and in many allied fields. I commend the fine job done by Joan Christodoulou in her exhaustive search, which is detailed in a white paper published by the Signage Foundation, Inc. This will become an invaluable resource to parties interested in signage, as well as a launching pad for those wishing to conduct empirical research.

LITERATURE REVIEW

My own search of the literature, aided by Dr. Vijaykumar Krishnan Palghat and Waqas Shah, focused exclusively on peer reviewed, academic (“scientific”) articles in the field of marketing communication, including those which speak directly to the topic of signage and those which may shed light by analogy. I’ve already mentioned the example of research on logos (Henderson and Cote 1998), in which responses to a visual stimulus are examined as a function of design attributes. Another example of findings that may apply by analogy is the case of billboard ads. A billboard ad is not an on-premise sign. However, inasmuch as it is a

visual presentation of graphic and textual information intended for customers and prospective customers, there may be principles or lessons from the domain of billboard advertising that are applicable to signage communication by analogy.

Moreover, my search of the marketing literature examined theories that help explain how visual information (such as that found on signs) is processed. Dual process models suggest multiple routes through which information can be – and typically is – processed, including both conscious and unconscious processes (Smith and DeCoster 2000).

These review findings were synthesized into a conceptual framework. The framework represents what we know, what we think we may know with reasonable certainty (by analogy), and what we do not yet know with certainty, but have theoretic speculation that yields testable propositions for future research.

Concerning “what we know” with fair certainty, I refer readers to the excellent, comprehensive review prepared by Joan Christodoulou. Here I will merely caution that until we map findings of published studies onto a conceptual framework, the picture can be a bit confusing and possibly even misleading. Some prior research findings may be contextually bound; that is, dependent upon specifics of time and place. Moreover, there are many published reports of effects that do not show evidence of underlying causal processes. In other words they report “what,” but not “why.” Knowing “what” is of limited use when we do not understand “why.” For example, a study by Martin and Jones (1998) reports that average recall of features of frequently encountered road signs was only 47%. The findings are interesting, but without understanding why frequently encountered signs are not well-remembered, we cannot design more memorable signs or motivate drivers to read existing signs. Rather, like a chemist searching for new drugs by trying thousands of random combinations of chemicals, the sign industry is condemned to trying various designs and measuring the memorability of each until a better design is discovered.

To this body of signage knowledge, we can – and I will argue *should* – add lessons learned from analogous contexts. Studies of outdoor advertising, visual branding (e.g., logos), and information processing all have potential to illuminate how visual communication is processed by audiences and leads to various outcomes relevant to the goals of signage. For example, we know from an examination of the processing fluency literature that both message content and the experience of processing it are important determinants of outcomes. People tend to use the subjective ease or difficulty of processing as though it were information about the stimulus being processed (Schwartz 2004). When processing is easy and effortless, a visual stimulus seems more familiar (Whittlesea 1993), is better liked (Reber *et al.* 1998; Winkielman and Cacioppo 2001), more trusted and believable (Reber and Schwarz 1999), and evaluated more positively (Lee and Labroo 2004).

One compelling demonstration of this “processing fluency” effect is an experiment conducted by Reber and Schwarz (1999). They presented simple messages in easy-to-read or hard-to-read formats by adjusting the contrast between the font color and the background color. Viewers were asked to rate the truth of each message. Results show that messages presented in easy-to-read, high contrast formats were rated on

average as more truthful. This effect is independent of message content or how much people like the font/background colors.

This finding would seem to have potentially important implications for signage. If a sign is clearly visible and legible, but difficult to read, the message it conveys or the brand/organization it represents may seem unfamiliar, be disliked, not trusted or believed, and be evaluated negatively on an unconscious or pre-conscious level. Hence the standard of legibility should not be mere readability (“can you read the sign?”), but rather ease of processing among the intended audience. Ease of processing can be assessed using direct, self-report measures or through response latency tests conducted under conditions that simulate natural viewing conditions (e.g., divided attention, passive exposure).

After cataloging “what we know” in a literature review, a logical next step would be to synthesize knowledge into a conceptual framework that describes how the puzzle pieces fit together and will help identify the missing pieces.

TOWARD A CONCEPTUAL FRAMEWORK

A conceptual framework is a sort of theoretical road map that shows how we get from here to there. “Here,” in this case, refers to signs – their design characteristics and placement. “There” refers to customers and prospective customers’ reactions, including cognitive, affective, and behavioral responses to signs. Perhaps the simplest type of map would depict only here and there. We call that a stimulus-response model. Signs are stimuli and customer reactions are responses. To fill in such a map, one need only identify the various stimulus properties of signs and all the different types of responses, such as recognition, recall of information, affective evaluations, behavioral intentions, etc.

A better map, however, would depict not only here and there, but also the places in between – in other words how we get from here to there. In the jargon of psychological science, the places in between are known as mediators or intervening processes. They help answer the questions *how and why* this has an effect on that. General systems theory describes a three-component model consisting of inputs (signs), processes (thinking and automatic processes), and outputs (reactions to signs). This is an improvement over the simple stimulus-response model, but still lacks an important element: *who* is doing the processing.

According to field theory (Lewin 1943), human responses are a joint product of environment (stimuli) and person (traits of individuals). Whereas a blue sign may look better to one person, a purple sign may look better in the eyes of another. Hence it would provide an incomplete picture to study, say, aesthetic judgment as a direct function of color without considering who is doing the judging, as well as the intervening how and why that leads to the judgment. Two individuals viewing the same object may arrive at different judgments because they have different tastes and preferences, or because they apply different evaluative criteria, or because they use entirely different thought processes. For example, whereas one may critically evaluate each element of an object against a subjective list of aesthetic criteria, the other may make an instantaneous thin-slice judgment on the basis of a global impression. Hence the characteristics of signs,

characteristics of the people who see them, and the psychological mechanisms used to process information are all important determinants of ultimate responses.

Yet another important element to consider in a conceptual framework is the “context” or situational variables that shape responses. The same person may process the same sign differently depending upon the situation. Examples of situational variables include shopping goal (i.e., recreational versus task-driven shopping), time limitations (leisurely processing vs. being in a rush), and contextual cues such as the proximity of a sign to other signs or its relationship to a building (“congruity”).

On the basis of the afore-going discussion, the conceptual framework I propose has five main elements: 1. Design characteristics of signs, including both objective and subjective properties, 2. person traits, 3. contextual variables, such as the placement of signs and their relationship to the surrounding environment, 4. mediating processes, including conscious and automatic, unconscious processes, and 5. response variables, including cognitive, affective, and behavioral responses. This is the skeleton of the framework. The literature as elaborated below puts some flesh on these bones, but it remains for future research to breathe life into the creature.

Design characteristics of signs

Signs can be characterized in terms of their design properties – the constituent attributes that comprise signs and convey information. Although there have been several published attempts to define attributes of signs (e.g., Calori 2007, Taylor et al. 2005), there is currently no standard, exhaustive, widely-accepted taxonomy describing the constituent design properties of signs. Why is this needed? I propose that this is an urgent need because description is a *necessary but not sufficient condition* for higher goals of research, such as explanation, prediction, and influence of outcomes. Adam had to name the animals before Aristotle could classify them, Leonardo daVinci could dissect them, Darwin could explain how they got here, and Jim Fowler could control them during appearances on the Johnny Carson Show. The point is that taxonomy – description and classification – are requisite steps to further scientific discovery.

In delineating the constituent properties of signs, it is important to distinguish between *objective* characteristics such as size, shape, color, versus *subjective* characteristics, which are descriptive labels that viewers attach to objects. Objective properties reside within an object and comprise the object; subjective properties are intermediate reactions that reside within the perceiver. So, for example, one might characterize a sign as “attractive” or “interesting.” These are not really constituent properties of signs, but rather viewers’ evaluations. As another example, legibility is not an objective property of signs, but rather a perception on the part of viewers, as is “quality.”

Here is a short list of objective properties gleaned from the literature: size, type (e.g., textual vs. graphic, static v. changing, digital v. non-digital), shape, material, colors, font (type and size), luminance,

message content, informational density and complexity. Each has been studied in some context, as attested to in Christodoulou's comprehensive review.

To this list we can add subjective properties of signs – evaluative labels viewers may attach to signs, such as attractiveness, perceived quality, novelty/familiarity, interestingness, perceived complexity, legibility, perceived clarity/ambiguity, congruity with expectations (or “surprisingness”), and congruity with architecture or surrounding environment (“aesthetic congruity”). Objective properties such as size, shape, materials and colors should combine interactively to create subjective impressions such as attractiveness, interestingness, etc. Moreover, certain properties such as complexity or informational density may operate through the subjective filter of perceived complexity, font and size through a subjective filter of perceived legibility, etc. (Note that whereas perceptions of complexity tend to diminish over repeated viewings across time, one man's complexity can be another man's simplicity. Similarly, the same size and font will be differentially legible to Superman versus Mr. MaGoo.)

The above lists represent an initial attempt at identifying potentially important objective and subjective properties of signs. Perhaps additional properties can be identified by surveying designers and manufacturers of signs. Although properties were delineated, they were not classified. Further refinement of this scheme – adding to the list and classifying elements into a taxonomic order – is a task commended to future research efforts.

Person traits

There are many ways to characterize individuals who compose the audience for signage. The challenge is to identify a relevant set of traits that have some explanatory power to elucidate the processing of and responses to sign communication. To get the party started, I propose the following:

Age. Due to declining fertility and increasing life expectancy, the average age of the population is increasing (Weil 2009). Age matters because both visual acuity and cognitive speed vary across age groups. On the topic of visual acuity, I refer readers to the fascinating presentation of Dr. Linzie, titled “Emerging Cognitive Science Technologies: Models That Predict Human Visual Attention.” Those of us who have had the experience of fumbling for reading glasses or asking an excited young person to repeat something a little slower intuitively understand visual acuity and cognitive speed. These issues have profound implications for signage communication, because as the population ages signs get a little fuzzy and we cannot read them as fast.

Familiarity. Familiarity of a stimulus is a function of amount and frequency of exposure. In the case of signage, highly familiar, frequently encountered signs should be processed differently than unfamiliar signs upon first encounter. The literature indicates that familiarity has several effects, such as reducing perceived

complexity of a stimulus (Cox and Cox 1988) and, *ceteris paribus*, increasing liking of a stimulus (Zajonc 1968). Generally, exposure increases familiarity and familiarity enhances information processing, including both recall and the acquisition of new information (Johnson and Russo 1984). However, there is some evidence to suggest that extreme familiarity can reduce recall and learning of information (Edell and Keller 1989). Thus it would seem prudent to consider not only the characteristics of a sign, but exposure conditions and audience familiarity as well.

Internal states. Information is processed differently depending upon internal states of the perceiver, such as arousal and affect. Arousal tends to have the ironic effect of attracting more attention, but interfering with acquisition of information (Eysenck 1982). Theory and evidence also show that affective states (such as elevated or depressed moods) influence information processing (Isen *et al.* 1978). In general, people in good moods are more receptive to information – particularly positive information (Wadlinger and Isaacowitz 2006); however, they may ignore it if it holds potential to deflate their mood (“mood preservation hypothesis”).

Motivational predispositions. Processing may also be influenced by differential motivational states and traits, such as the need for cognition (Cacioppo, Petty, and Morris 1983) or the need for cognitive closure (Webster and Kruglanski 1994). Need for cognition refers to the extent to which people enjoy and regularly engage in the process of thinking. Individuals characterized by a high need for cognition are internally motivated to process information such as that communicated by signs. Individuals characterized by a low need for cognition may be thought of as “cognitive misers.” They are not stupid, but they only think when they have to think. Thus they are less apt to process information found on signs unless there is some compelling reason to process it or they are externally motivated to do so. The need for cognitive closure refers to individuals’ desire for a definitive conclusion. An individual with a high need for closure is decisive, prefers order and predictability, and dislikes ambiguity. Such individuals are prone to form quick judgments and to stick with them. Individuals with a low need for closure will not rush to judgment. Rather, he will take his time to process and decode information.

In most cases, the audience for signage would be composed of a mix of people low and high in the needs for cognition and cognitive closure. Creators, users, and regulators of signage could benefit from an understanding of how a given sign may be processed quite differently (or not at all) by different members of an audience as a function of motivational states. As an example of an implication for design, signs should be constructed to represent brands/organizations and convey messages through multiple routes, including both conscious (evaluation of content) and automatic, unconscious processes (conditioning, meta-cognitive experience), because communication takes place via different routes for individuals characterized by different motivational states/traits. As an example of a regulatory implication, consider that in some cases

signage may be like a warning label on a bottle of medicine. Informational content may be there, but it may not be processed as intended by some audience members due to the format. Hence to be meaningful to the public, regulatory guidelines should be developed on the basis of how information is likely to be processed and used.

Contextual variables

There are three contextual issues that seem particularly germane to the processing of information from signage. All three relate to placement. The first is the distance of the sign from viewers, (or average distance given a distribution of viewing distances), which will influence visibility, attention, recognition, legibility, and attendant processing of the information. Obviously, this variable will interact with size to influence outcomes. When size and distance combine to reduce processing fluency, effortful processing may either not take place (“too hard”) or will evoke the unintended negative consequences of meta-cognition (Schwartz 2004).

A second contextual issue is that of perspective or angle of view. Research indicates that the same message or object viewed from different angles will be processed differently. For example, in a seminal study of camera angle effects, Kraft (1987) found differences in comprehension, recall, and evaluations as a function of vertical angle. He speculated that angle effects may stem from our experience in the natural visual world. Looking up *at* an object, as a child looks up at an adult, may translate to looking up *to* the object. Meyers-Levy and Peracchio (1992) examined the influence of camera angle on attitudes toward products pictured in ads. They found that products were perceived as strong or potent when photographed from low, upward-looking camera angles. The same products were perceived as relatively weak and inferior when photographed from a high, downward-looking angle. This effect, however, may depend on the amount of processing viewers devote to the ad (Peracchio and Meyers-Levy 2005). The implication for sign placement seems straight forward. A ground-mounted sign that people look down on will be perceived differently from the same sign mounted up on a building, even if the signs are otherwise identical in design and content. Regulators and users of signs should consider potentially deleterious effects of down-angles when determining the placement of ground-mounted signs.

Yet another placement issue concerns where a sign lies within a viewer’s field of vision. When an object is squarely in a viewer’s field of vision (within 1.5 degrees of the focal point), the visual signal is sent to both hemispheres of the brain. However, when an object is outside the focal range, contralateral conduction takes place (Beaton 1985). That means whereas an object placed to the left of the main focus will sent to the brain’s right hemisphere for processing, an object placed to the right of the main focus will sent to the brain’s left hemisphere for processing. Moreover, whereas hemispheres have different processing styles, a peripherally placed object may be evaluated differently. Janiszewski (1988) tested this idea with ads placed to the right or left of focal newspaper articles and found that whereas pictorial ads placed in the left visual field

were evaluated more favorably than those placed in the right visual field, verbal ads placed in the right visual field were evaluated more favorably than those placed in the left visual field. It appears that people form pre-conscious attitudes toward objects (such as ads) and that these attitudes can be swayed by mere placement of the object within the visual field. By analogy, verbal information conveyed by a sign placed in the right visual field of most passers-by and pictorial information conveyed by a sign placed in the left visual field of most may generate the most positive impact. I say *may* because I am not aware of published field tests that have examined this directly in a signage context. But if my business were on the left side of a one-way street, I think I would want a pictorial sign mounted at drivers' eye level.

A third contextual issue is that of a sign's relationship to its surrounding environment. There is a vast literature that suggests an object will be perceived, remembered, evaluated differently depending upon its immediate surroundings ("context effect") and its relationship to its immediate surroundings ("stimulus congruity"). If a sign is highly distinctive – larger, more colorful, or otherwise different from other signs in the immediate environment – it may effectively attract attention, but the incongruity makes it more effortful to process. Ditto for signs that are aesthetically incongruent with the surrounding architecture of which they are a part. This could have a number of unintended consequences, such as negative evaluation and, ironically, such incongruous signs may even be less memorable due to the absence of a pre-existing cognitive schema (Heckler and Childers 1992, Meyers-Levy and Tybout 1989) and weak linkages in associative memory networks (Schmitt *et al.* 1993). The relationship between stimulus congruity and outcomes such as remembering and liking is not strictly linear. A moderate amount of incongruity can tickle interest, particularly if the incongruity can be resolved with a little effort, which leads to enhanced liking and recall. Thus, from a marketing communication standpoint, there is no reason for signage to be maximally high in congruity with the surrounding environment. Slight incongruity may be perceived as interesting, novel, creative.

Processes

There are a number of psychological mechanisms that may serve as intervening processes by which signage leads to various consumer responses. These include both conscious and unconscious processes.

Conscious processes occur when one looks at a sign ("attention") and attempts to read or otherwise interpret meanings conveyed by the sign ("perception"). Once a basic message has been decoded, other processes such as memory (encoding and storage) and evaluation can occur. These processes are generally well known and well understood. To be effective as a marketing communication medium, signs must attract and retain attention, be easily understood, easily recognized, evaluated positively, etc.

Unconscious processes, by contrast, are generally less well known and less understood. Yet they may offer better explanations for how signage works. They may be the more powerful forces underlying sign communication.

One example of an unconscious process is meta-cognitive experience. Meta-cognitive experience refers to the experience of thinking (“processing fluency”). Thinking can be relatively easy or difficult, depending upon what we are thinking about. A growing body of research evidence shows that people tend to use the ease or difficulty of thinking as information in its own right. So when the information conveyed by a sign is easy to process, easy to understand, easy to retrieve from memory, the information tends to seem more familiar, to be liked, trusted, believed, evaluated positively, etc., as previously noted. The reverse is also true. Signs that are difficult to process, understand, or recognize, may seem unfamiliar and disliked despite repeated exposure. Such processing fluency effects take place without conscious awareness. That is, they are automatic – they just happen.

Yet another example of an unconscious process is associative learning or conditioning. Recall Pavlov’s dogs. Evidence from the marketing and psychology literature suggests that humans’ responses may also be conditioned through unconsciously learned associations. For example, when people like the features in an advertisement, such as the background music, they tend to develop a liking for the advertised brand by association (Gorn 1982). By analogy, if people like the design features of a sign (e.g., colors, pleasing design), they may “learn” to like the brand or organization represented by the sign simply by association. Like processing fluency effects, conditioning takes place automatically, without the conscious awareness of individuals. People form attitudes, which later translate into intentions and behaviors.

Thin-slice judgment is yet another process by which people form lasting impressions. Thin-slice judgment is an effortless, automatic process that takes place without conscious deliberation (Bargh 2002). Popular sources describe the phenomenon as a sort of intuition, an instantaneous impression (Gladwell 2005). Given that consumer audiences are often not highly motivated to process commercial signage, and given that signage is often viewed from a moving vehicle under conditions of divided attention, it seems likely that thin-slice judgment would play a role in the “processing” of signage. Thus signs designed under an assumption that people will stop, read, and think, may not be as effective as those designed under an assumption of thin-slice processing. Because thin-slice judgments are made on the basis of quickly accessible cues, the design features of a sign might be more significant than the verbal message content (Peracchio and Luna 2006). In fact, in thin-slice judgment the design features *are* the message content.

There are still other psychological mechanisms that operate in the cracks between conscious and unconscious processing. Anchoring and adjustment is one such process (Wilson *et al.* 1996). Upon initial exposure to a stimulus (sign), people may form an impression that becomes a strongly held attitude. Upon repeated exposure to the stimulus (sign), people may gain additional information or have additional thoughts that lead to an adjustment of the initial impression. These adjustments, however, tend to be slight and may never overcome the initial impression. One possible reason for this is so-called “selective hypothesis testing” (Cronley *et al.* 2005). Once people have formed an initial impression or opinion, they tend to gather additional information selectively so as to confirm their opinion, ignoring other information that might conflict with

that opinion. Although anchoring and adjustment involve conscious thought to form the initial opinion, people are generally unaware of their proneness to selective hypothesis testing. Thus the tendency to “seize and freeze” on an opinion may be thought of as an automatic, unconscious process.

Outcomes

There are many outcomes of interest in sign communication. For the purposes of our conceptual framework, we can categorize these as cognitive, affective, and behavioral responses.

Cognitive responses are thoughts. They include perceptions, interpretations, recall and recognition – the identification of signs previously encountered, the formation of attitudes (toward the sign itself and toward the brand or organization represented by the sign), evaluations, impressions, beliefs, opinions, associations, aesthetic judgments, certain types of learning, persuasion (trusting a source and agreeing with a message), and so on. The common theme underlying these variables is thought. Cognitive responses are products of conscious thought, and the responses reside inside the heads of individuals.

Affective responses refer to emotions and feelings. Signs may elicit feelings of pleasure (“this sign makes me feel good”) or arousal (“this sign makes me feel relaxed or excited”), or affective evaluations (“I like this sign”). A humorous sign may put viewers in a good mood. A controversial sign may arouse feelings of anger. A sign announcing a sad event may evoke feelings of sadness. Affective responses are important outcomes, because along with cognitive responses they precede and determine ultimate behavioral responses.

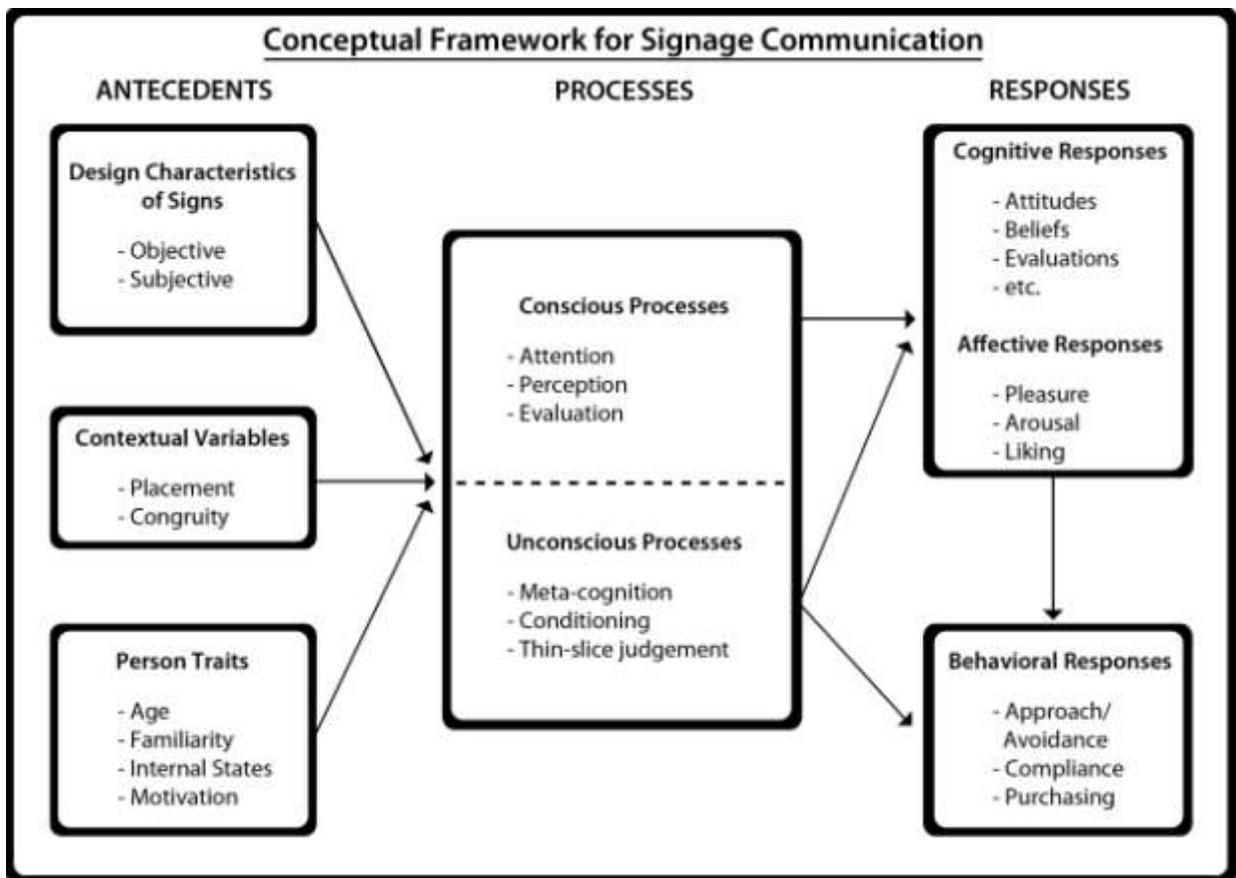
Behavioral responses are concrete actions. They can range from simple approach/avoidance behaviors, such as patronizing or avoiding a business, to more complex behaviors such as compliance with instructions or telling other people about the information you encountered on a sign. Whereas some behaviors are automatic, involuntary, performed mindlessly (e.g., blinking), others are intentional, voluntary, driven by conscious decisions and intentions. Signs may trigger both types of behaviors. The relevancy of a behavioral response depends upon the goals of the sign; and, in any case, complex behaviors – such as making a shopping trip to a store that is running a sale and making a purchase – are generally mediated by cognitive evaluations.

Linking the model components together

Not far from my house there is a little hole-in-the-wall restaurant called *The Friendly Stop*. There is a large sign in the window that reads “Get in here!” Consider for a moment how this piece of marketing communication does *not* operate. It does not operate by people seeing the sign and mindlessly obeying the instruction. What is more likely is that people see the sign and have a number of intermediate responses. The sign may evoke a chuckle and attendant positive affect and liking. Whereas it is slightly incongruous, it may incite some cognitive elaboration. People may infer the fun, casual character of the restaurant from the sign, or conclude that they are or are not in the restaurant’s target market on the basis of the message’s content or

tone. People may use attributes of the cheaply made and carelessly worded sign as inferential cues to conclude that the restaurant is cheap, casual, downscale. This inference will shape future behavioral responses. Or, people driving south on Rt. 4 may catch a small glimpse of the sign in the periphery of their right visual field and form a favorable preconscious attitude that leads to a future stop at the restaurant for reasons unknown to the patron! What is most likely is that the sign's behavioral effects operate through all of these mechanisms, reaching different people through different, concurrently operating mechanisms.

The diagram that follows provides an overview of the basic linkages in the conceptual framework. The objective and subjective features of signs, contextual variables, and person traits are antecedents that combine to evoke various conscious and unconscious processes, which lead to cognitive, affective, and ultimately behavioral outcomes. Behavioral outcomes are preceded and determined in part by cognitive and affective responses. This conceptual framework should be useful for organizing our thinking about signage research, for mapping published findings onto the "big picture," and for identifying missing pieces of the puzzle.



A RESEARCH AGENDA

Reviewing the literature of signage is somewhat like getting at Ph.D. At the end of the long journey you realize just how little you actually know. What we don't know, however, should be regarded as an opportunity. It is an opportunity to identify and prioritize research needs, to build bridges between academe and industry, and to develop an objective, scientific basis for the design and regulation of signage.

One research opportunity is to develop a comprehensive taxonomy of design characteristics that can be used to describe signage. As I have argued, this is a necessary first step to facilitate research showing how design features combine with each other, with viewing context, and with viewer traits to produce predictable and controllable outcomes. The objective and subjective design features listed in the conceptual framework are merely an initial attempt to identify potentially important variables. Further development of this portion of the framework is required.

A second research opportunity suggested by the literature review and conceptual framework is in the area of visual acuity, legibility, and meta-cognition. Given the growing body of evidence in marketing and psychology showing that people tend to use the experience of thinking as though it were information, it would seem important to assess the impact of legibility not only in terms of comprehension, but in terms of processing fluency as well. Again, if a sign can be read, but readers must exert ample effort to do so, effortful processing may cast a dark cloud over the information such that it is less liked, trusted, believed, etc.; or the demands of effortful processing may de-motivate processing to the extent that the sign is simply ignored. The goal of research in meta-cognitive experience of signage processing would be to develop an objective basis for determining the size and other attributes of signage that facilitate both legibility and processing fluency.

Yet a third research opportunity suggested by the literature review and conceptual framework is in the area of context effects and congruity. It is clear that a visual stimulus can be interpreted differently depending upon the context in which it is viewed, its relationship to its surroundings, and the congruity of the stimulus with viewers' expectations. So what does this imply for signage? Architects and planners must make expert judgments concerning the appropriateness of signage. One important criterion for appropriateness is the aesthetic congruity of a sign with its surroundings (architecture and community). What is the underlying basis for such judgments? Are there perceptual gaps between expert judgment and those of the public and/or business owners? What is congruity and what are the effects of incongruity? These are all questions that can be informed by empirical research.

The conceptual framework suggests many other possibilities for future research, including work on the conceptual framework itself. As new evidence is mapped onto the framework, the relative importance of various design features and intervening processes as determinants of consumer responses should come into sharper focus. Moreover, a secondary effect of signage research in marketing should be to "mainstream" this under-represented topic. As more parties get interested in the topic of signage and marketing communication, the knowledge base should grow.

CONCLUDING REMARKS

It was a pleasure to share these thoughts concerning research on signage as marketing communication and to provide a glimpse at the activities of the Womack / Gemini sign chair at the University of Cincinnati. Signage is a fascinating and meaningful context in which to conduct research that serves both the mission of academe to expand theoretic knowledge and the practical needs of an industry that seeks to communicate effectively.

In conclusion I would like once again to thank the Weinels publicly for their generous sponsorship of the chair I occupy, the Signage Foundation for their sponsorship of this conference, Patty Herbin for her organizational efforts, my new dean, Ralph Katerberg, and department head, Dr. Karen Machleit, for institutional support of our joint efforts with the signage industry. There are many others who have offered kind words, invaluable advice, and offers of support for my research efforts, among them the Swormstedt brothers, Tod, the director of the American Sign Museum, and Wade, the editor of *Signs of the Times* magazine.

For additional information concerning the research presented here or questions concerning the educational and research activities of the Womack / Gemini chair, interested readers are encouraged to contact me at James.Kellaris@UC.edu.

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