

PRODUCT
COMMUNICATION:
FORM, FAILURE AND
SAFETY LEN D. SINGER

Portsmouth, Virginia
Singer, 126-141

© Visible Language, 2009
Rhode Island School of Design
Providence, Rhode Island 02903

Although the term 'culture' has become a subject of much recent discussion in design, much is due to the promotion and spread of global marketing. But little understanding of its meaning and design implications has, as yet, been explored. This paper examines E.T. Hall's classic theory of *culture as communication* in an effort to introduce cultural theory to current design thought and to examine its role in the development and analysis of design *form*, as well as design *failure* with unintended safety consequences. Illustrated examples of conflicting, confusing or otherwise failed product and graphic design are analyzed to identify hidden, often unlikely, causes and safety hazards. Hall's *Triad Theory of Change* and *Primary Message Systems* are used to help explain the context from which such failures can be further analyzed for discussion and study.

INTRODUCTION

When we think of communication what usually comes to mind are written or spoken words and other symbols to convey information. The same goes for communication design—most often thought of as simply graphic or digital design. But the scope of human communication reaches far beyond visible or spoken language. Nonverbal language, including sign, action and object language, permeates every aspect of our lives and is essential for almost any degree of effective communication. Far more pervasive than once thought, according to the noted nonverbal language pioneer and respected authority, R.L. Birdwhistle, in a typical two person conversation, nonverbal communication is said to account for as much as sixty-five percent of its social meaning (Knapp, 1967). Often hidden, but instinctively understood, gestures, postures, glances, actions and other non-verbal modes of “body language” have recently gained increasing interest and attention. But, ironically, while it often provides essential emphasis and subtle nuance as well as ‘color’ so meaningful to any verbal conversation, most is lost during translation.

It is estimated that, since gesture language preceded oral communication (speech) by close to a million years, over 700,000 distinct gesture signals were already identified (Pei, 1949). Also, the first records of cave art engravings trace the known beginnings of pictorial representation or graphic design at least 40,000 years ago (Breuil, 1952). The term ‘object or product communication’ was first recognized in 1956 as a distinct language in Ruesch and Kees’ *Nonverbal Communication, Notes on the Visual Perception of Human Communication*. That same year their early classic *The Perception of Human Communication* was the first comprehensive study of nonverbal language and remains today, the reference of choice. Three basic nonverbal forms of codification were identified as sign language, action language and object language—of which many variations of each were since discovered and elaborated by others (Ruesch and Kees, 1956):

Sign Language includes all those forms of codification in which words, numbers and punctuation signs have been supplanted by gestures; these vary from the monosyllabic gesture of the hitchhiker to such complete systems as language for the deaf.

Action Language embraces all movements not used exclusively as signals. Such acts as walking and drinking, for example, have a dual function: on the one hand they serve personal needs, and on the other they constitute statements for those who may perceive them,

Object language comprises all intentional and unintentional display of material things such as implements, machines, art objects, architectural structures and last but not least—the human body and whatever clothes covers it. The embodiment of letters as they occur in books and on signs has a material substance, and this aspect of words also has to be considered as object language.

Of most relevance to this paper, however, is *object language*—the most passive, durable but least noticed and understood, type of non-verbal communication. All objects have *form or shape*. Products of course are also objects—but with a purpose or function, i.e., to work efficiently and safely.

FORM INFORMS

Form can inform, reform and deform. It can also appeal, reveal and conceal. The first impression a user makes upon contact with an object or product is its form or shape—a product's most conspicuous characteristic and a major factor in all design decisions. Indeed, form is the one characteristic that clearly distinguishes architecture, industrial and graphic design from all other design activity. Whether intended or not, active or inactive, products continuously convey information, meaning and values. These values are transmitted through users' intimate contact over time—not unlike “breaking in” an old shoe for optimum fit—the product-user relationship that makes it so personal and hard to replace. So it is with form.

Form can reform. The shoe “learns” or shapes to its user's contours and needs, i.e., sweat, smell, heat, sound etc. while the user adjusts, learns and “gets used to it” for mutual fit and appeal. It can help direct and guide user actions and shape perceptions and attitudes as to what a product is, was and “wants to be.” An object's form is an unobtrusive, hidden, silent information storehouse of considerable archeological as well as design value and interest. Much of this nonverbal information

resides in its surface characteristics and properties as “skin”—the face it presents—with permeable channels to its internal and external environment. Skin is the point of contact where users develop an initial impression and later, intimate relation of dependence and trust. Break that trust and product-life suffers or dies with it when discarded, disused or returned as defective. And if permitted, form can also deform. Form wears, degrades and deforms through long periods of normal use—or misuse and disuse. But also when unintended consequences cause errors compromising fit and comfort or interfere with proper and safe use, then design has failed.

As material culture—encompassing all of technology—from cave art engravings and paintings to highly automated mass-produced digital products of today, man-made objects provide the only continuous record of human cultural evolution to date. Indeed, our cumulative knowledge of human cultural evolution is based on reconstructions of information coded in object language.

This paper examines communication as a cultural, rather than conventional communication theory, a highly condensed symbolization theory having emerged along with the development of communication technology, and prior to the recognition and study of nonverbal and object language and communication; the focus of this paper. When design fails for reasons unknown or difficult to identify, explain or understand, most likely it can be attributed to hidden, or non-verbal, cultural causes. Out-of-aware behavior reflecting levels of consciousness and irrational behavior, as well as complex cultural conditioning can also play a role. Such theories are based on the work of cultural anthropologist Edward. T. Hall, as proposed in his 1956 classic, *The Silent Language* and later in 1966, as elaborated in his companion book *The Hidden Dimension*. Hall was also among the first to recognize and examine the anthropological and historic importance of the approximate evolution of culture, language and tool-making together as communication—key to enabling man to become “human.” And, the link between communication, technology and design was to follow.

DESIGN FAILURE

Failure is most often determined by specified quantitative measures, but rarely in graphic or industrial design—other than in relation to marketing objectives. Failure of course, is a relative term subject to the definition and meaning of *success*—another elusive term. For the purpose of this paper, however, design failure will be examined from three perspectives.

Communication Failure

If a conversation between two people, or distributed printed material is misunderstood, confusing, ambiguous or otherwise difficult to understand by its readers, communication has failed—sometimes with serious consequences. Ruesch and Kees (1956) describe the process of communication *success*—and by implication, communication failure if unsuccessful.

People communicate by making statements. These statements are signals that are coded in various prearranged ways. When they impinge upon earlier impressions, they become signs. These signs in the strictest sense of the word, exist only in the minds of people, because their interpretation is based on prior agreements. A statement becomes a message [only] when it has been perceived and interpreted by another person. Finally when sender and receiver can consensually validate an interpretation, then communication has been successful.

Unintended Consequences and Safety

Along with forms' inevitable potential, came style and its commercialization. And in consumption-driven, capitalist society where change and choice is the rule, form becomes a transient, disposable commodity along with quality—that elusive, but important term—and where form often seems to follow fiction in seemingly meaningless pursuit of adventure. Change for change sake may be the elixir of life, but when it leads to harm, especially that which puts public safety at risk, design fails.

Market-created and promoted, style can be rational, irrational or both subject to unexpected consequences, or rewards in an often aimless search for novelty. Form can also hurt—even kill—as well as protect from danger or harm. But form can be therapeutic as well. With built-in cues, barriers and other measures, a product's form can be designed to help monitor and guide users to avoid unintended consequences leading to failure. When such design precautions are ignored or over-looked, design has failed. It goes without saying that of all possible consequences of design failure, safety is most important.

Product Semantics

Among the first detailed papers on the subject, *Product Semantics: Exploring the Symbolic Qualities of Form* by Klaus Krippendorff and Reinhard Butter remains one of the few that distinguish product semantics from traditional semantic theory by focusing on the operational interface between designer, user and object. They proposed a feedback process to monitor, manipulate, relate and align product form to user perceptions for greater user compatibility and fit, where most errors occur. The process reveals problems or “infelicities” (inappropriate results for the situation or purpose) such as unintentional symbolic incongruities leading to errors, misunderstandings and “potential disastrous mistakes” in the design of emergency equipment for example. But it is largely based on modified information/communication theory and marketing-based professional business models for research that, of course, promotes design. This provides the advertising and design world with rhetorical cultural meaning and rationale where it becomes acculturated long before it reaches the user. The theory omits, however, among other things, the importance of intimate, multi-sensory aspects of product-user relations beyond the simple form, shape and texture model of all products. It also overlooks potentially hidden factors based on culturally-conditioned senses such as smell, taste, weight, vibration, sound, etc., as well as visual characteristics of product operational use distinctive to such situational events (Krippendorff and Butter, 1984).

The Cultural Connection

Hall proposed in 1956 a cultural theory of all human behavior in which language, tool-making and culture evolved approximately together as *interdependent* communication—the critical event that enabled man to become “human”—where communication is culture (and culture is communication). As such, one cannot speak accordingly about one without the other. Here, Hall and Trager presented a structural analysis of all human behavior as culture, perceived on levels of consciousness, modes of behavior and change. Accordingly, culture, in effect, largely exists on two broad levels of consciousness—from fully aware to unaware, rational to irrational, or overt to covert (subconscious), as revealed not only through dreams but also normal complexities, including the emotional, creative and irrational aspects of everyday life, also, as expressed in nonverbal as well as verbal terms.

Hall also found that behavior has three, rather than two, as previously thought, dynamic cultural characteristics or modes of behavior: *formal*, *informal* and *technical*, that cycle in a pattern of change from technical to informal to formal and back to technical—where most innovation occurs. Here, in technical mode military, medical and scientific activity for example, originates and develops. In contrast, the informal mode of culture, where rules and conditions are flexible, and style is encouraged and explored, change is most often introduced. If form endures and stabilizes to achieve classic status, it becomes more than a product; it becomes a symbol where tradition largely rules. Religion, also largely a formal belief system of words, actions and objects, including its readings, vestments, buildings, etc., also exemplifies the formal mode of culture. But formal living is also part of everyday aspects of life at home, office, school, shop, military, etc. or any situation where rules and authority are in compliance, and where objects and behavior are seen as essential stabilizing forces only to be questioned or violated at one's risk. To better appreciate this and its consequences, try appearing at a formal event, such as a place of worship or even a formal dinner in your "Sunday (or Saturday) best," but in bare feet, and see what happens. Indeed, conflicts are often fought over formal stability and informal change.

As for design implications derived from Hall's theory of culture as communication made possible by the inventions of language and material culture, design plays a key role in what we think, know and do; more importantly, how we effect and can effect change. Of all the developmental systems Hall proposes, perhaps most directly significant to design is his theory of cultural change. It was observed that The Triad Theory of Cyclical, Cultural Change, with technical, informal and formal reflecting the three levels of culture, corresponded to the historical continuum of cultural process and evolution to provide a cultural perspective from which product life may be viewed as seen in the past, present and future tense.

The Three Levels of Cultural Change

Formal > Past Informal > Present Technical > Future

It follows then that “good design” (yet still another elusive term) recognizes and reflects all three phases of cultural change—with one dominant at any given moment. For designers, manufacturers and businesses, this provides a basic understanding and appreciation of *product change*, and the complex social processes that support, promote and enable it as an important step toward product “quality” in today’s highly competitive global markets.

The Primary Message Systems is key to understanding much of Hall’s theory of *culture as communication*. This is based on the ten message systems of all related, interactive, bio-basic (rooted in our biological past) human activities that distinguish us as human social beings. This includes all interactive variants of human behavior, summarized in detail in Hall’s *A Map of Culture*, an interactive matrix-map of the ten basic message systems as interactive, related and applied to all others (Hall, 1956).

The Ten Primary Message Systems

- 0 Interaction
- 1 Association
- 2 Subsistence
- 3 Bisexuality
- 4 Territoriality
- 5 Temporality
- 6 Learning
- 7 Play
- 8 Defense
- 9 Exploitation

Of the ten categories, *interaction* (mostly non-verbal communication) and *exploitation* (of natural resources) refer to all of man-made material culture (including technology) and their interactive variants. Hall was among the first to recognize and explore other hidden, but important nonverbal communication dimensions, such as time and space as first presented in *The Silent Language* and later elaborated in his other important classic, *The Hidden Dimension* in 1966. In it he describes the importance and role of culture in shaping behavior as well as buildings, spaces and settings influenced by design—often completely *out of one's awareness*. It was then that Hall coined the term *Proxemics* to describe the study of how space is used, consciously and unconsciously, to establish and maintain human relationships, essentially through nonverbal communication. This has since been widely acknowledged and applied in public and private buildings, spaces, places and other social settings. It includes specialized health-care applications such as geriatric and psychiatric facilities, therapeutic and non-therapeutic, as well as businesses and other commercial enterprises (Hall, 1966).

The following examples illustrate how product form can influence (and be influenced) by cultural factors, to challenge, restrict or otherwise interfere with safe and efficient use of products. An example of conflicting verbal and nonverbal images and messages of form—with apparently unintended consequences is the “Dr. Mailbox ambulance”—parked ready for “emergencies” (*figure 1*). Although we can laugh at the cynical cultural incongruities of the double meaning, it poses a serious risk to drivers and pedestrians that glance at the vehicle in motion, with or without a siren, often on busy urban streets with little time to safely respond to the familiar ambulance shape, color and design. The medically deceptive, meaningless words “Dr. Mailbox” prominently displayed to replace the word “ambulance” is but a minor distraction, as the vehicle’s clear nonverbal message remains and dominates the scene—“make way for the ambulance!” This reveals not only the traffic authorities’ incompetence that permits such obvious transgressions, it also confuses the public while compromising the trust and endangering the safety of the community. It also reveals an apathetic public apparently uninterested and unaware of the consequences of such hazards—to say nothing of the apparent lack of legal protection as displayed by licensing the transferred ambulance as is.

The trend to use public buses as moving billboards is another case of conflicting messages. The bus, a public vehicle, becomes a giant, full-time traveling billboard when wrapped as a commercial message (*figure 2*). Boarding passengers, having no choice of alternative transportation, are in effect compelled to endorse the message it carries as it travels along its network of streets and neighborhoods selling its product. But it also infringes on passengers' rights and interferes with their ability to clearly see out windows, especially at night, when looking for bus stops and stations, street signs and other destination landmarks. Moreover, it creates a claustrophobic effect of being trapped inside an enclosed moving vehicle with strangers, inviting potential crime unseen by passing pedestrians. As a public vehicle, its primary responsibility is of course to its passengers and the public. As such it serves neither—and fails both.

Figure 1
"Ambulance" the danger
of conflicting messages.



Figure 2.
Public transportation
or moving billboards?



Although not as serious a public safety issue, but a growing security problem, is the gradual privatization of official government services. The United States Postal Service is offering personalized U.S. stamps displaying almost any picture of choice including family, friends, relatives, pets or anything else (figure 3). We now find school children, for example, *designing* official state license plates. Even Social Security check envelopes are being challenged by the confusion among the growing piles of mail junk with official-looking, carefully copied envelopes masquerading as official government documents to steal attention. One might wonder what in fact is the purpose of a license plate or government document, if not for accurate identification, confidence and security?



Figure 3
Official U.S. Postage Stamps or Personal Advertising?

Or likewise, official Medicare envelopes, designed years ago to be distinguished from other mail, implied a sense of attention and *special importance*. This is now lost in a sea of meaningless advertising among official-looking envelopes that confuse and compete with the genuine for attention. But such seemingly harmless, but deliberate, misinformation can be seen as crossing a cultural divide. All cultures operate on two main levels of consciousness, overt and covert or visible and invisible behavior, expressed through formal, informal and technical stages. When the process is disrupted and the message is misunderstood, the public is harmed and design fails.

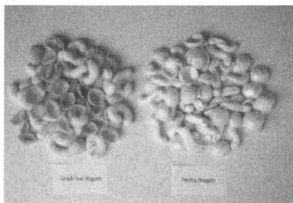
A clear example of preventable *misinformation* is the danger of accidentally misplacing a small soldering-acid bottle near an identical eye-drop bottle where it can easily be mistaken for the other— both with the same identically-shaped and textured top. This could have dire consequences (*figure 4*). Here, design attention to distinguish the shape and tactile communication between the two, especially the bottle top, is crucial in preventing such potentially catastrophic mistakes. The indiscriminate and irresponsible practice of packaging both harmful and therapeutic or nutritional consumer products in the same containers, apparently for cost savings regardless of content or purpose, clearly exhibits a lack of design attention to the multi-sensory communication potential in such objects, often critical in interacting safely as well as effectively with users and others.

Figure 4
Bottle shape confusion with catastrophic consequences (soldering acid, left, eye medication, right).



Another example of preventable misinformation is the widely used, peanut-shaped packaging “nuggets.” When an open package is left unattended at home, an infant or small child can easily mistake the nuggets for a common foam-like snack food closely resembling its shape, size, feel and texture. And if swallowed, the infant or child could easily suffocate and die (*figure 5*).

Figure 5
Product shape confusion with catastrophic consequences (snack-food, left, packing materials, right).



CONCLUSIONS

Failure in design often occurs when form is limited only to imagination, inadequate product development (trial and error), irresponsible choices and unaccountability for unintended consequences—from security to fraud to injury and physical harm. Happening all at once it's a *perfect storm*. But strangely, *failure* is rarely mentioned or discussed in architecture, visual, product or industrial design today. This can be attributed to lack of agreement as to what in fact design is and how to measure, if not achieve, success. Awards are often given for “good design” by a juried decision with or without meaningful critique. This should not surprise those in the aesthetic design fields, including architecture, graphic and product design; that must deal with this elusive situation daily. The purpose of this paper was to get inside that process from a cultural perspective and hopefully bring new meaning and light to the creative process itself—another subject long neglected. But after years of serious study and investigation, design research remains unable to bridge the critical gap between conscious and unconscious, or out-of-aware aspects of design. Viewing *design as communication*, acknowledging the nonverbal cultural links that tie humanities, human sciences, technology and design together, provides an historical perspective so lacking in design today. If this paper does nothing more than encourage designers to better appreciate and understand the role and importance of *design, as communication*, in making design decisions, it will have succeeded. Despite an apparent lack of technical or detailed description, design as communication is an important and *controlling* part of our lives,

REFERENCES

- Breuill, H. 1952. *Four Hundred Centuries of Cave Art*. Brooklyn, NY: Hacker Books.
- Hall, E.T. 1956. *The Silent Language*. New York, NY: Doubleday, 196.
- Hall, E.T. 1966. *The Hidden Dimension*. New York, NY: Doubleday.
- Knapp, M.L. 1972. *Nonverbal Behavior in Human Interaction*. New York, N.Y, Holt Reinhart & Winston, 12.
- Krippendorff, K. and R. Butter. 1984. Product Semantics, Exploring the Symbolic Qualities of Form. *Innovation, Journal of the Industrial Designers Society of America*, 3.2, 4-9.
- Pei, M. 1949. *The Story of Language*. New York, NY: Lippincott.
- Ruesch, J. and W. Kees. 1956. *Nonverbal Communication, Notes on The Visual Perception of Human Relations*. Berkeley, CA: University of California Press, Berkeley, 189.
- Singer, L.D. 2009. Design Failure, Safety and Form. In *Proceedings IRF Integrity, Reliability and Failure: challenges and opportunities*. Porto, Portugal: University of Porto, July 20-24, references 1222, 1-9.
- Singer, L.D. 1993. Product Safety and Form. *Interface*, 93, 84-88.

AUTHOR NOTE

Len D. Singer is a design educator, design researcher and practicing industrial designer. He has taught in leading schools in the US and abroad. He was a Research Leadership Professor at the Georgia Institute of Technology in Atlanta, GA and served as an assistant to the cultural anthropologist, E.T. Hall at the Center for Proxemic Research in Chicago. His present research interests are in design-related, cultural and human-factors research, issues and their design applications.

