

The ABCs of Label Design

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It could be argued that since the beginning of museums, exhibit labels have been used as instruments for torture on helpless visitors. One form of torture requires that visitors stand on their feet for long periods of time while reading labels containing hundreds of words. Another form forces visitors to read labels while glare from poor lighting makes the words impossible to see. In a third type of torture visitors are subjected to technical jargon and difficult vocabulary (e.g., see “unguligrade locomotion” from Weiner, 1963). Still another form of torture requires visitors to physically contort their body (crane their necks, bend over, etc.) in order to read. A fifth form of torture is to display lettering so small that it requires a magnifying glass to read. Another is forcing visitors to read faded or rubbed out lettering. A seventh form is to make visitors guess what the exhibit is all about by totally omitting labels or by providing labels that identify the wrong object. The list could go on and on.

Several authors have identified common label problems (e.g., Bitgood, 1989; Serrell, 1983; Screven, 1986). For example, Serrell (1983) listed eight deadly sins associated with labels. Screven (1986) has also offered a list of common label problems. In a more recent literature review, I added several new “sins” to Serrell’s list (Bitgood, 1989).

Labels can be designed so that they have a high probability of being read, meet the educational objectives of an exhibit, and create visitor satisfaction. To design such labels involves applying the principles of label design that have been evolving from the visitor studies literature. This chapter attempts to summarize some of these principles – principles derived and synthesized from a number of papers including: Bitgood, Nichols, Pierce, Conroy, and Patterson (1986); Bitgood (1989); Borun & Miller (1980); ; Rand (1985); Screven (1986); Serrell (1983; 1988). The reader is strongly encouraged to study these references since they offer more detailed information on various aspects of label design.

In addition to following the general design principles outlined in this paper, the chances of designing effective labels is also greatly increased if visitor input is incorporated into the development process. Front-end evaluation can be conducted during the planning stage to determine the knowledge (and misconceptions), interests, attitudes of potential visitors. Formative evaluation can be used during the preparation stage to trial test label messages and physical characteristics. Once the exhibit is installed, remedial evaluation (trial testing and revising inexpensive changes) can be

used to improve the impact on visitors. (See Bitgood, pp. 2-8, in this volume for a more detailed description of these visitor evaluation methods.)

This paper organizes the literature on exhibit labeling into three general components: (a) know your audience; (b) capture their attention; and (c) hold their attention. These are the ABCs of label design and the rapidly developing heuristics summarized in this chapter will hopefully be useful as a guideline to produce more effective labels. Basically, we are arguing that effective label design involves an understanding of the interaction between visitors and exhibit labels.

A. Know Your Audience

Label designers should be aware of how basic psychological and physiological mechanisms influence people's reactions to exhibits. If labels are to be designed effectively, it is important to incorporate these psychological and physiological processes into the planning and development process.

The Visitor Experience

One of the most important psychological considerations in knowing your audience is to understand what types of experiences are satisfying to visitors. People value a rich, multi-faceted experience during their visit to a museum, zoo, science center, etc. It is important that label designers recognize this multi-dimensional nature of the visitor experience. By multi-dimensional we mean that it consists of at least four components: cognitive, affective, sensory-perceptual, and behavioral. The cognitive dimension includes intellectual understanding; affective elements might be expressed through excitement, satisfaction, and attitude change; sensory-perceptual elements encompass the sights, sounds, and tactile cues from the environment; and the behavioral dimension includes psychomotor movements such as physical interaction with the exhibit. Research suggests that exhibits that address multiple dimensions of experience are likely to have a greater impact on visitors than those addressing a single dimension (Bitgood, 1990).

There is a growing trend for exhibition centers to facilitate the multi-dimensional experience described above. The Denver Art Museum has created interpretive labels that address multiple dimensions rather than leaving the novice visitor to react only with their emotions to the art works (McDermott-Lewis, 1990). That is, the museum created labels that addressed visitor looking skills (sensory-perceptual) and cognitive knowledge (information about the artist and cultural context). Part of their rationale was that novice visitors needed guidance in order to experience art works in any way other than emotionally.

A similar approach to the visitor experience is taken by proponents of the visitor immersion experience (e.g. Bitgood, 1990; Coe, 1985). Exhibits

designed to create this experience emphasize affective (excitement, attitude change) and sensory-perceptual (realistic sights, sounds, touch) outcomes as much as cognitive (intellectual).

Cognitive Limitations

Three problems are of particular concern: the comprehension level of the reader; human memory capabilities, and the phenomenon of object satiation.

The reader must comprehend or understand the text if communication is going to be effective. Beverly Serrell (1988) describes "conceptual and vocabulary barriers" in label design. The concepts and jargon of most disciplines are difficult for us to understand unless we are familiar with the terminology of that area. While exhibit developers often have admirable educational objectives, the exhibit as a medium for communication may have serious limitations for difficult-to-grasp topics and long story lines. Technical experts from a particular discipline usually make poor label writers because they are too familiar with the subject matter and have difficulty translating the messages to clear, nontechnical writing. In addition to reducing technical jargon, comprehension of label content can be facilitated if the organization and format of the label follows guidelines (see "Physical Organization of Label" under "Holding Audience Attention" below).

As most of us know, the human mind has a limited capacity to remember information unless it follows some basic principles. One of the keys to memory is how the information is encoded or stored. Memory improves: if the information is organized in a meaningful way, if mental imagery is used for encoding, if effortful processing takes place, and if the encoding of information involves elaboration (e.g., Santrock, 1988). Labels need to organize information in a manner that is meaningful to visitors. Labels may also be more effective if they call up images in the minds of the reader. Effortful processing requires the individual to engage in additional effort or work. A title label that asks a question is sometimes effective in stimulating this effort in terms of such thinking. Finally, elaboration involves more extensive processing of information. For example, thinking about examples of a concept in addition to reading its definition would involve such elaboration.

There is often a decrease in visitor attention over time when confronted with a large number of similar objects. This phenomenon has been termed "object satiation" (Robinson, 1928) and it appears to be a universal problem in exhibition centers. Robinson found that decreases in attention to exhibit objects occurred as visitors viewed successive paintings in an art museum. This satiation could not be attributed to physical fatigue because it occurred even when people were seated looking at a large number of prints of paintings. Given this observation with exhibit objects, it seems reasonable to assume that a similar satiation effect occurs with labels. That is, too

much text or too many labels may create a decrease in interest and consequently a decrease in reading over successive labels.

Line of Sight Placement

As we move through an environment, we are most likely to attend to objects that fall within our visual field without physically turning, twisting, or scanning the environment (Bitgood, Benefield, & Patterson, 1990). When objects appear in this limited zone, it seems that they receive greater attention. Line of sight can often be predicted by walking through an exhibit area and noting where your visual attention naturally falls.

Perceived Time/Effort Versus Benefits

Several authors (e.g., Bitgood, 1989; Screven, 1986) have suggested that a cost-benefit principle helps to explain label reading in museums and other exhibition centers. Visitors tend not to expend the time unless they anticipate a sufficient payoff. Thus, the decision to read or not to read is based, to some degree, on the perceived time/effort (cost) versus the perceived payoff (benefit). We have yet to have a visitor tell us that he/she came to the museum to read a textbook on a wall! Even when visitors come to learn, that doesn't mean reading volumes of label text. People are more likely to visit to satisfy their curiosity, to relax and enjoy themselves, to be with friends and family, etc. If a visitor's interest level is high in a particular subject area, the chances of reading may be increased.

Information Overload

Information overload refers to the failure to process information because of too many simultaneous stimulus inputs. First-time visitors, in particular, are overwhelmed with sights and sounds. They don't know to which stimuli to attend. Not only do they have to find their way through the environment, but they must also attempt to understand the multiple messages imbedded in exhibits. Bitgood and Bishop (1991) found that first-time visitors perceived a museum differently than repeat visitors and they speculated that at least some of this difference may be the result of information overload for the first-time visitors. Repeat visitors can make more sense out of the information because they are already familiar with much of it.

Visitor Preconceptions

Visitors do not arrive at the museum door with an empty mind. They come with preconceptions about the subject matter. Some of these notions are accurate, some are not. Some of these conceptions may be based on strong religious biases (e.g., refusal to accept evolutionary theory); some may be based on illusion (e.g., belief in E.S.P.); and some may be based on exposure to mass media (e.g., mentally ill people are dangerous). Whatever their source, it is important to discover inaccurate preconceptions and address

these in exhibit design. Borun (1988; 1989) has shown that people have misconceptions about gravity and air pressure that are not easy to shake. Common misconceptions are not restricted to the sciences. Bitgood and Benefield (1990) found, when asked what they know about Southeastern Native Americans, many people incorrectly identified teepees and other objects from the Plains Indian culture. If carefully designed and tested, exhibits should be able to clear up the most widespread of these faulty preconceptions.

Complex Motivations for Visiting

People visit museums and zoos for many reasons – to socialize with friends and family, to experience something worthwhile, to relax, etc. Hood (1983) identified six major leisure-activity goals of visitors: being with people, or social interaction; doing something worthwhile; feeling comfortable and at ease in one's surroundings; having a challenge of new experiences; having an opportunity to learn; and participating actively. Keeping the variety of visitor goals in mind may help to design more effective labels.

Serrell (1988) suggested that the social nature of a visit for most people can be recognized if labels are designed to “. . . answer commonly asked questions; promote discussion and sharing of information; encourage observation; and contain games and humor.” (p. 407)

The Visual System

The human visual system has its limitations. Unfortunately, exhibit and label designers do not always consider these limitations. Few of us have perfect vision. And, even with perfect eyesight, it can be torture to read poorly designed labels. Attention to placement, letter size, and lighting will often determine whether or not the labels can be read comfortably or sometimes read at all. Label reading requires that the reader can focus the image of the text on the fovea of the eye where visual acuity is best, that enough light enters the eye to enable reading, and that the letters are legible.

The aging process creates at least two problems for the reader: visual acuity and lighting level. Many older visitors wear bifocals or reading glasses and switching their visual focus from near to far can be difficult. In addition, the older we are, the more light we need to see the same thing. Lighting levels should be adequate for all ages. Color blindness is another limitation that should be considered. Males are particularly susceptible to this problem since it is a sex-linked characteristic. The most common problem is red-green color blindness. If red letters are used on a green background, everything may appear gray to a person with this problem.

If labels are designed to accommodate these common visual limitations, they should also work better for all individuals, whether or not they suffer from such limitations.

Other Physical Limitations

In addition to the visual system, physical limitations include normal fatigue, mobility impairments, and problems of physical stature or height. Standing for long periods of time causes fatigue. If bending or stretching is required to read labels, fatigue occurs even more quickly. Any exhibit design features that reduce the buildup of fatigue will increase the probability of visitor label reading.

Mobility problems are most serious for wheelchair-bound visitors. Perhaps designers would be more sensitive to the needs of this population if they were required to wheelchair through a large number of exhibit areas while designing exhibits.

The problem of physical stature is that people's height may range over several feet. The ideal placement height for a seven-foot basketball player is inadequate for a small child, a short adult, or a wheelchair-bound visitor.

Summary

Human factors (psychological and physiological processes) must be considered in all aspects of exhibit design. More effective labels are possible when designers understand factors such as visual processing, fatigue, object satiation, line of sight, information processing, effort/benefit ratio, and complex motivations. As discussed below, these factors play a critical role in attracting and holding visitor attention.

B. Capture Audience Attention

The physical characteristics of the label and its context or surroundings will influence whether or not visitors are attracted to the label. Attracting attention is essential in exhibition settings because visitors are on their own and usually are not sure what stimuli are important. Effective labels will focus visitor attention and are instrumental in decreasing uncertainty as to what is important. The following discussion describes factors that appear to be important in capturing the attention of visitors.

Label Placement

Placement of labels is critical (e.g., Bitgood, Benefield, & Patterson, 1990). Visitors are most likely to read labels if they are within the line of sight so that visitors do not have to turn, look up high, or down low. Ideally, labels should be placed where visitors can stop and look at exhibit objects and read the labels without moving to another location. We found that in both zoos and a natural history museum, labels placed overhead, behind the visitor, or on the side of an exhibit were attended to less often than labels placed on the railing in front which facilitates label reading and exhibit viewing. Of course, it is not always possible to place a label on a railing. But, the significant element of placement seems to be where the

visitor stops to look at the exhibit. Visitors are most likely to read if they can look at the exhibit objects and labels with minimal movement.

Label Length

Label length is another variable that has been shown to influence visitor attention (e.g., Borun & Miller, 1980; Bitgood, et al, 1986; Thompson & Bitgood, 1988). In general, labels with less than 75 words appear to have the greatest chance of being read unless the subject matter is particularly interesting. One possible reason why short labels are more likely to be read than longer labels is the effort/benefit decision-making process noted above that seems to operate in informal educational settings. Longer labels may be perceived as more effort than they are worth.

Letter Size

Letters should be large enough to be read easily from the locations that visitors generally stop to view the exhibit. Bitgood, et al., (1986) found that increasing font size from 18- to 36-point increased the number of readers by about 15 percent. Smith & Wolf (1991) found significant differences in ratings of legibility when comparing 14- to 30-point typesize. Letter size influences both legibility and attention. If the letters are too small, they are unreadable. In addition, larger letters capture attention more easily because of their salience. Of course, common sense should tell us that letter size may also be too large. Letters are too large if visitors have to back up to read comfortably, or the label size overpowers the rest of the exhibit.

Lighting

Lighting level should be of sufficient illumination so that visitors can read the label without straining. In addition, glare from other light sources should be carefully controlled. Despite the obvious problems with poor lighting levels and glare, a large number of museums and zoos have problems in this area. Smith & Wolf (1991) found that artificial lighting, glare, shadows, and low levels of light interacted with contrast between letters and background as well as with installation variables.

Proximity of Labels to Objects

Proximity of labels to the objects they describe is important for two reasons. First, as noted above, visitors are more likely to read if they can stop and look at exhibits and read labels without moving from the spot. Bitgood, et al., (1986) found that moving labels closer to the objects they described increased the percentage of readers.

A second reason for the importance of proximity is that misunderstandings can be minimized if it is clear which objects the label describes. It is not unusual to see labels closer to objects that are not relevant than to

the objects they are supposed to describe. This is a critical problem in situations where the identity of the objects is not obvious.

Density of Visual Stimuli

High visual density tends to create confusion and information overload. High density can even make it difficult to find the labels if they are lost among numerous other objects, direction signs, etc. Melton (1935) found that the density of paintings on walls in an art museum related to the total time in the gallery and the amount of attention given to each painting. When the number of paintings was increased, the time per painting decreased. A pilot study we conducted appears to confirm that the same principle applies to label density. Too many labels on a wall seem to compete with one another for the visitors' attention.

Other Variables

There are undoubtedly other variables that influence attention to labels. However, there is little empirical data available on which, if any, of these variables has a significant impact on capturing visitors' attention. We must wait for further studies before drawing any conclusions.

C. Hold Audience Attention

In the previous section ("Capture Audience Attention"), we discussed factors that influence whether or not visitors look at the labels. The literature suggests that there is one class of variables that influences attraction and another class that influences duration of attention. This section discusses how to hold attention after you succeed in getting it. In general, it can be argued that the legibility and content of the label are the major factors responsible for holding the visitors' attention.

Legibility of text

Legibility of text should be an important factor in how long people will read. Unfortunately, there are no studies that examined the relationship between reading time and legibility. However, Smith and Wolf (1991), at the Metropolitan Museum of Art, have studied the relationship between the perceived legibility of text and factors such as contrast, letter typography (e.g., type faces). They found that contrast between text and background exerted a significant effect on legibility ratings. In addition, contrary to traditional wisdom, a variety of typefaces were judged legible.

Visitor Interests

"A false assumption frequently made by many exhibit designers and writers is that the audience will be as interested in the topic as are the creators of the exhibit." (Serrell, 1988)

How do you know how to select topics in which visitors are interested? Can you rely on experts' opinions of where the interests of visitors lie? Unfortunately, neither you nor most experts can always predict visitor interests. It sometimes helps to ask docents and security guards about the kinds of questions they get from visitors. It also helps to go out and listen to and observe visitors. Another way to determine visitor interests is to ask them. Conducting a front-end evaluation where visitors are asked to describe or rate their interests is a valuable method of information gathering.

We are not arguing that exhibits should pander to visitor interests. Institutions of informal learning have an obligation to educate the public and this obligation should not be abandoned to attract visitors with sensationalism. The challenge often is to present a boring topic in an interesting manner.

Audience Involvement

Effective labels will draw visitors into the subject matter. An exciting writing style helps to accomplish such involvement. Take this example from the Monterey Bay Aquarium:

"Life is boring in the wharf . . . Borers can eat themselves out of house and home." (Rand, 1985)

We have recently completed three studies (Bitgood, 1990) that suggest label content contributes significantly to the degree of involvement in the visitor experience. In one of these studies we found a high correlation between overall ratings of exhibits and label content. Good labels help the subject matter come to life for visitors.

Of course, many other factors are likely to contribute to audience involvement; for example, the use of clear language and the physical layout or organization of the label. These factors are discussed in sections below.

Clear Language

As stated above, technical language can be a real turn off to visitors. Too often technical language creeps into labels because professional jargon is used so often that we assume that everyone understands it. Three suggestions for searching out and destroying these technical terms: (1) have friends/peers who are not familiar with the jargon read the text; (2) test it out on visitors by conducting a mock-up study to find out if they understand the message and the terminology; and (3) use label writers who are experienced at writing nontechnical copy.

In all of our studies with visitors, we have never found a highly educated visitor insulted by simple, clear language. However, time and time again we have found visitors confused by overly technical language.

Questions and Interactive Graphics

Questions are often used in the headline of a label. This seems to be an effective technique for stimulating interest. For example:

“What’s out there under all that water?” (Rand, 1985).

“Such questions attract attention, direct viewers, encourage comparisons, and “direct attention to or describe other examples of the same processes.” (Screven, 1986).

The content of the question is also critical. “Effective questions facilitate learning by defining issues, directing attention, shaping perceptions, and providing practice in applying ideas.” (Screven, 1986, p. 128).

Hirschi & Screven (1988) found that adding questions to exhibit cases dramatically increased reading of labels. Under these conditions, even the most poorly designed labels were likely to be read.

Note that questions may play a different role in a self-guiding brochure. Korn (1988) found that question headings were no more effective than declarative headings in a self-guiding brochure at the Chicago Botanic Garden.

Visitor Misconceptions

We know that visitors often come to the museum with misconceptions about the subject matter. Once these misconceptions are identified, they can be directly addressed in the label content. Another example from the Monterey Bay Aquarium:

“They may look empty, but mudflats crawl with life.”
(Rand, 1985).

It is important to realize, however, that many misconceptions are not easily altered. Evaluation is necessary to determine if the misconceptions are being effectively corrected by your labels and exhibits.

Label Content and Exhibit Objects

Label content should be closely related to exhibit objects. Again, the Monterey Bay Aquarium provides an excellent example:

“Watch as these small silvery fish pass in a school, and you’ll catch some ‘yawning’.” (Rand, 1985).

Beverly Serrell (1988) argued that signs should:

“... contain feedback; be visually and concretely related to the exhibit; and contain experiential information and instruction (e.g., ‘look for . . .,’ ‘compare . . .,’ or ‘notice . . .’).” (p. 407).

Physical Organization of the Label

Not everyone is a dedicated, serious reader. Some will simply skim for information they desire and ignore the rest. There are several ways to organize a label that make it less demanding for visitors to find information whether they are serious readers or skimmers. These methods include: information mapping (consistent layout); layering information; and bulleting the major points.

Information mapping is a way to help visitors find information easily (Screven, 1986). It is a text writing method in which the information is visually coded into different categories through the use of such visual cues as indentations, flow diagrams, boxed enclosures, type styles, and colors. Screven gives the following example:

“Labels that follow information-mapping principals may, for example, place generalizations in square boxes and supporting evidence on colored backgrounds, set definitions in italics, and indent and underline examples of a principle. Persons who want only the main point (generalization) need only read the text in square boxes; those who need examples look at indentations. Viewers are not forced to read many sentences to find the information they are seeking or to find out that the desired information isn't there.” (pp. 129-130).

Layering is another technique described by Screven (1986). This is a technique that “divides information into small chunks and ‘layers’ them in some way – perhaps beginning with a lead idea, instructions, an attention-directing questions, or a menu.” This method makes it easier for visitors to identify or select information of interest to them. Screven suggested four ways to layer information:

- Express the main ideas in larger or bold type; smaller type for detail.
- Use flip panels with major points on outside and detail hidden beneath layers of hinged panels.
- Use computer layers with branching information available.
- Provide take-home flyers for visitors who desire more information.

Bulleting the main points (as shown above) is yet another way of making it easy for visitors to find information. The use of bullets to identify major points makes quick scanning possible thus freeing viewers from the task of reading each word or searching through each sentence in order to find information they want.

Competing Stimuli

Distracting sights and sounds may be one of the most common reasons for visitors' usually short attention span to label reading. Visitors will

often stop reading when they see movement at a nearby exhibit or hear a sound that potentially offers something of interest. In zoos, for example, we have seen visitors stop reading and turn to watch the zoo train go by. Rarely do visitors return to the label once they have been distracted.

Summary and Recommendations

To be effective, labels must be consistent with human factors – the psychological and physical characteristics that influence the behavior of people in exhibition settings. Related to these human factors' processes are a number of guiding principles that seem to influence whether or not the labels are noticed by visitors (attracting attention) and whether or not they cause visitors to read for a sufficient duration (holding attention). Some of these guiding principles or heuristics emerging from the literature have been described above. An important part of applying these principles, however, involves obtaining visitor input or evaluation.

Evaluation should be part of all aspects of the process of label development. While our ability to predict label effectiveness may be growing, it is not always possible to predict the impact of label content and physical characteristics on visitors. The following suggestions should be considered during label development.

1. Use **front-end evaluation** to find out what the audience already knows, what they don't know, where their interests lie, and to identify possible misconceptions (e.g., Shettel, 1989). If the messages in the label do not fit the audience, effective communication is unlikely to occur.
2. Have **clear goals and objectives** for exhibits. You must know exactly what you hope to communicate and how visitors are expected to respond if the exhibit and labels are to communicate successfully (e.g., Screven, 1986; Serrell, 1988).
3. Conduct **formative evaluation** to test labels (e.g., Screven, 1990). By testing an inexpensive mockup with visitors and making changes in the label before the final version is produced, poor labeling is less likely to occur.
4. Use **summative evaluation** to see if the final product worked. Once the labels are installed, a final test can be conducted to ensure they are accomplishing their objectives.
5. Try **remedial evaluation** to fix labels that are not working (Screven, 1990). Remedial evaluation attempts to correct problems after the final installation. Small changes in labels can often have a profound impact on

how visitors experience an exhibit. Changes might include altering the position of text, the number of words, the content, etc.

6. Measure affective as well as cognitive and behavioral outcomes. Often, measurements of effectiveness focus on information or cognitive outcomes, but do not assess affective outcomes such as satisfaction, excitement, etc. We have found it useful to ask visitors to rate exhibits on descriptors such as: "The labels help you to feel involved in the exhibit." "The exhibit makes the subject come to life." "The exhibit makes you feel that you are really in the time and place described." "The exhibit is meaningful."

In conclusion, designing effective labels involves more than artistically displaying information about exhibit objects. It involves applying an understanding of how people behave, think, and feel in an exhibit environment. Label designers who can apply both the art and science of labelling are most successful in communicating with their audience.

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Note

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