HUMAN FACTORS FOR TECHNICAL COMMUNICATORS
By
Marlana Coe
(Wiley Technical Communication Library)

Lecture 6
Human Factors

Optimally designing for people takes into account not only the ergonomics of design, but also the cognitive implications of design.

Human factors involves understanding the physicality of how people interact with and use objects as well as the psychology of how their mental processes interact with each other to understand and use objects.

Designing successful technical communications requires a human factors relationship between technical communicators and users. There is an implied trust that users place on technical communications when they read and use the instructional documents.

Human factors metaphor for technical communication is the proverbial onion.
Human Factors Metaphor for Technical Communication

The users’ world is at the center. At the point farthest from the users’ world is the text (content). In order to get to the text, users have to peel back the layers of the subtext: medium, navigation, and presentation. Users trust that designers have chosen the appropriate medium, designed clear, intuitive, and “holeless” navigation; and that the designer has created a supportive, intuitive presentation that allows the content to shine through.

Users never enter the world of the technical communicators but that the technical communicator and the information always enter the world of the users.

Users expect you (designers) to recognize that your information is an invited guest in their world, that they control their world, and that they are trusting you and your information not to violate any mores of their world.
Sensation and Perception

Sensation and perception are two ends of a continuum we use to take in sensory data. This continuum is the foundation for everything we think and do. At the sensation end of the continuum is a set of physical processes (external stimuli, nerve pathway to carry the impulse to the brain, area of the brain to receive the impulse etc) by which we collect data from the world. At the perception end is a set of cognitive processes we employ to organize, interpret, store, retrieve, and apply the data that sensation provides.

Preattentive processes do not involve higher, cognitive functions; they are primarily a process that operates quickly, randomly, and without conscious knowledge. Example: Include a step in a sequential procedural assembly instruction which looks very obvious to the designer and do not need explicit mention (preattentive process).

Attentive processes do involve cognitive processes such as learning, memory, and understanding.
Sensory Data Filters

Sensory data bombards us all the time. Protecting us from these data are three phenomena: thresholds, cocktail-party effect and sensory adaptation.

**Absolute threshold**: This is the smallest amount of stimulus that we can detect fifty percent of the time. Experience, expectation and motivation all play a part. As design is created, designers have to understand those users’ threshold changes rapidly. Information should be created such that users can access information rapidly regardless of their psychological state.

**Just Noticeable Difference**: Is the navigation and searchability of your information a large proportion of users’ energy and effort, or so easy it almost appears effortless?

**Cocktail Party Effect**: This helps shield us from sensory data. This effect is our ability to zero in on what is important to us while filtering out the data that is not important.

**Sensory Adaptation**: Do not try to surprise your users with all the technical capability at your disposal. Use it judiciously and help users adapt to the changing conditions slowly.
Visual Perception – Gestalt Design Principles

*Gestalt* is a psychology term which means "unified whole". It refers to theories of visual perception developed by German psychologists in the 1920s. These theories attempt to describe how people tend to organize visual elements into groups or unified wholes when certain principles are applied. These principles are:

**Similarity**

*Similarity* occurs when objects look similar to one another. People often perceive them as a group or pattern.

The example above (containing 11 distinct objects) appears as single unit because all of the shapes have similarity.

Unity occurs because the triangular shapes at the bottom of the eagle symbol look similar to the shapes that form the sunburst.
Continuation

Continuation occurs when the eye is compelled to move through one object and continue to another object.

Continuation occurs in the example above, because the viewer’s eye will naturally follow a line or curve. The smooth flowing crossbar of the "H" leads the eye directly to the maple leaf.

When similarity occurs, an object can be emphasized if it is dissimilar to the others. This is called anomaly.

The figure on the far right becomes a focal point because it is dissimilar to the other shapes.
Closure

*Closure* occurs when an object is *incomplete* or a space is not *completely enclosed*. If enough of the shape is indicated, people perceive the whole by filling in the missing information.

![Panda](image)

Although the panda above is not complete, enough is present for the eye to complete the shape. When the *viewer’s perception completes a shape*, closure occurs.

Proximity

*Proximity* occurs when elements are placed close together. They tend to be perceived as a group.
Figure and Ground

The eye differentiates an object from its surrounding area. A form, silhouette, or shape is naturally perceived as figure (object), while the surrounding area is perceived as ground (background). Balancing figure and ground can make the perceived image clearer. Using unusual figure/ground relationships can add interest and subtlety to an image.

In this image, the figure and ground relationships change as the eye perceives the form of a shade or the silhouette of a face.
Stages of Learning

• Beginning or Novice

**Characteristics:** Large # of errors, Attention to every detail or activity, Unable to screen out irrelevant information, Inconsistent performance, slow and shaky, uncoordinated.

**Designer cues:** Increase corrective feedback, use short verbal cues, use demonstrations, videotape etc, and lots of opportunity to explore skills.

• Intermediate

**Characteristics:** Fewer errors, motor program develops, performer discovers environmental regularities, anticipation develops, learns to monitor own feedback.

**Designer cues:** Distribute corrective feedback, stress correct fundamentals, and accommodate differences in the rate of skill development, lots of opportunity for practice.

• Advanced

**Characteristics:** motor program becomes units of action, decreased attention demands, confidence increases, strategy forming, performance gains are slower.

**Designer cues:** Focus on strategy, work on mental focus, develop learner diagnosis of skill, encourage, motivate and support.
 Practice Workshop # 2

- Situate the human factors metaphor for a particular website that you often use to argue why you think the design of the site is good or bad? Feel free to look through the other cognitive issues that we discussed in class while making your argument.

- Try to find out how and to what extent the Gestalt principles have been used in the website of your choice.