

Propositional Density

The relationship between the elements of a design and the meaning they convey. Designs with high propositional density are more interesting and memorable than designs with low propositional density.

Propositional density is the amount of information conveyed in an object or environment per unit element.¹ High propositional density is a key factor in making designs engaging and memorable—it is what makes double entendres interesting and puns funny (i.e., they express multiple meanings with a single phrase). For present purposes, a proposition is an elementary statement about an object or environment that cannot be easily broken down into constituent propositions. There are two types of propositions: surface propositions and deep propositions. Surface propositions are the salient perceptible elements of an object or environment. Deep propositions are the underlying and often hidden meanings of those elements. Propositional density can be estimated by dividing the number of deep propositions by the number of surface propositions, or mathematically:

$$PD \approx P_d / P_s$$

where:

PD is propositional density.

P_d is the number of deep propositions.

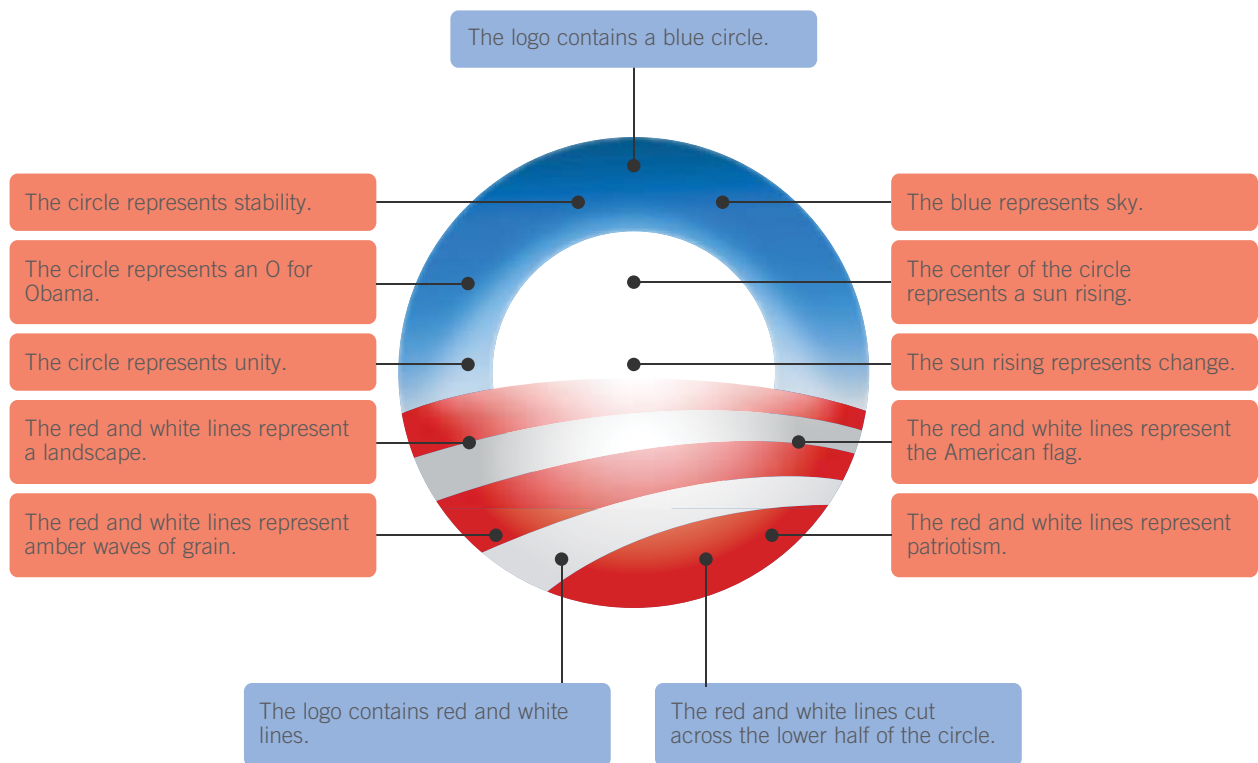
P_s is the number of surface propositions.

Objects and environments with high PD ($PD > 1$) are perceived to be more interesting and engaging than objects and environments with low PD ($PD < 1$). Simple objects and environments (i.e., few surface propositions) that are rich in meaning (many deep propositions) are perceived to be the most compelling. Consider, for example, the modern Apple, Inc., logo. The surface propositions expressed by the logo are the body of the apple, top leaf, and missing chunk. The deep propositions include, but are not limited to, the following: The apple is a healthy fruit; the apple tree is the biblical tree of knowledge; a bite from the apple represents a means to attain knowledge; Sir Isaac Newton's epiphany about gravity came from a falling apple; an apple a day keeps the doctor away; an apple is an appropriate gift for a teacher; and so on. With just the propositions listed, the Apple logo would have a $PD \approx 2$, a high propositional density that makes the logo interesting to look at and easy to remember.

Consider propositional density in all aspects of design. Favor simple elements that are rich in meaning. Aspire to achieve the highest propositional density possible, but make sure the deep propositions are complementary. Contradictory deep propositions can confuse the message and nullify prospective benefits.

See also Archetypes, Cost-Benefit, Layering, and Signal-to-Noise Ratio.

¹ The seminal theoretical work on propositional density is *Syntactic Structures* by Noam Chomsky, Mouton & Co., 1957. For other examples of practical applications, see "Building Great Sentences: Exploring the Writer's Craft" by Brooks Landon, The Teaching Company, Course No. 2368, 2008; "A Plain Man's Guide to the Theory of Signs in Architecture" by Geoffrey Broadbent, in *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory* by Kate Nesbitt, Princeton Architectural Press, 1996, p. 124–141.



The logo of Barack Obama's 2008 presidential campaign has received wide acclaim for its design, but the logo's high propositional density ($PD \approx 10 / 3 \approx 3.33$) is the prime cause of its success.