

Notes on the Visual Differential Theory

Robert A. Manning

Conceptual Framework

The notion of a visual differential is derived from the concept of a semantic differential, a psychological testing technique developed by Charles Osgood¹ at the University of Illinois and used subsequently by numerous researchers.² Practically, the visual differential theory first developed out of a need to explain why various types of visual manipulations could result in different kinds of communication design, i.e., information, persuasion, and stimulation. To discover the basis of such manipulatory techniques would be of obvious benefit in education as well as in the practice of visual communication design.

Given this background, the function of the visual differential theory is twofold: it can provide a model for comparative visual analysis, and it can provide a framework which will enable a student to consciously expand his visual vocabulary.

That a visual differential exists is an observable phenomenon. In her book, *A Primer of Visual Literacy*, Dondis presents many bi-polar adjectives as a means of describing the visual forces at work in various examples of communication design. Balance-instability, unity-fragmentation, subtlety-boldness, transparency-opacity are only a few of such pairs used in her work. Other writers on visual fundamentals have generated similar lists of bi-polar adjectives.

In order to develop a paradigm of visual manipulation and a subsequent theoretic model, the complexity inherent in visual communication has to be reduced; i.e., stated with a minimum number of components.

Conceptual Model

The visual differential theory is based on three³ components. Investigation reveals that some concepts in visual communication design are prime; and by their innate virtue as basic ideas (or collections of ideas) have become the components upon which the model is based. The three components are: order, graphic, and literal modes.⁴

Since the three dimensions of the visual differential theory are based on semantic differential technique, a list consisting of bi-polar adjectives is required to define each of the components of the theory.

Many pairs of words were generated and tested through their application to images and with computer aided correlation studies of responses. The lists used here to define each mode (order, graphic, or literal) have evolved as a result of such testing and reliability studies. They are not absolute and other reliable lists could be generated and used for the same purpose. The bi-polar adjectives and their reliability will vary depending on who develops them. It is important that the lists of word pairs⁵ support the notion of the mode for which they are generated.

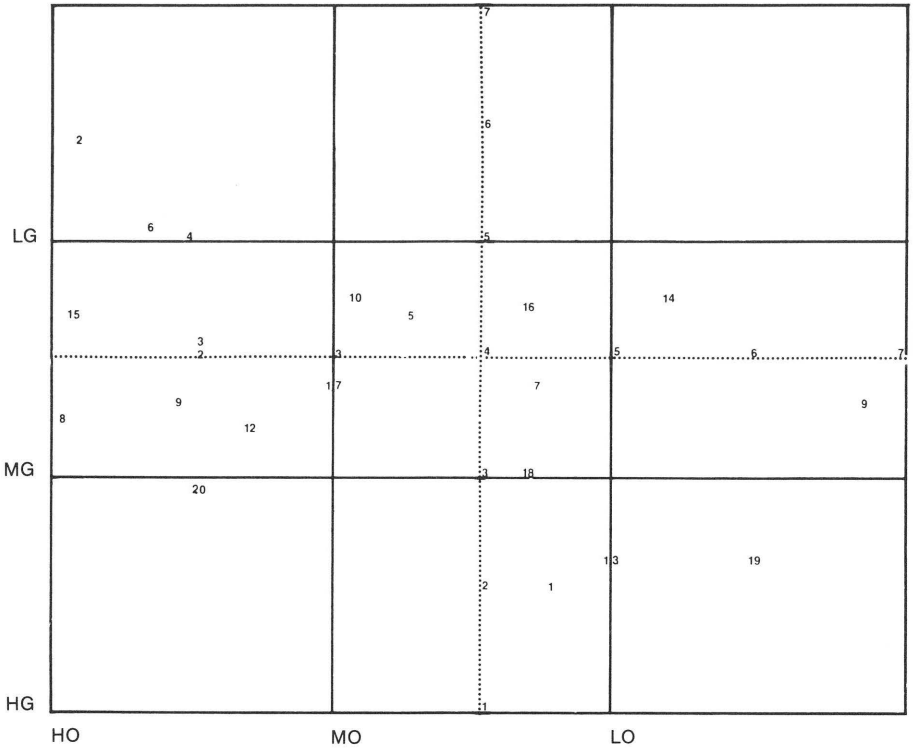


Figure 1
SEMMAP presentation of twenty images in relation to the graphic and order modes.

Lists of bi-polar adjectives were developed collectively by groups of about twenty people. This was done essentially as a democratic process with much discussion of the virtues of the word pairs and their application to the scales which they define. The lists were then systematically reduced to five pairs each to facilitate the parameters of the computer program SEMMAP (Semantic Mapping Program) subsequently used.⁶

The SEMMAP program produces two-dimensional maps of concepts seen from the viewpoints of individual observers or groups of observers. Concepts may be ideas, objects, people, or anything that may be evaluated using bi-polar semantic differential scales. The location of concepts on a map is determined by two coordinates representing position on the two major axes, or factors, defining the semantic space mapped. Coordinates are calculated by averaging the values from two or more bi-polar adjective scales highly correlated with the individual factors.

Two runs are made in a normal mapping study. The first run produces a correlation matrix for all the scales used (up to 10). From this matrix, scales are selected that correlate well with the intended factors. In the second run the designated scales are used to calculate two dimensional coordinates for each concept and maps are produced from the view point of any individual observer or group of observers. A master map is printed averaging the views of all observers and identifying concepts by number (Figure 1).

Order Mode

Bi-polar adjectives generated for the component, order, are shown in Table 1.

The top of the scale represents the theoretic maximum order⁷ (high order, HO) and the bottom, the theoretic minimum order (low order, LO) regardless of which combination of bi-polar adjectives is used. It is also implied that this is a sliding scale and the exact middle represents medium order (MO). All other points in between maximum and minimum order represent degrees of orderliness. Simply illustrated with lines, the scale can look like this (Figure 2).⁸ The logotypes juxtaposed with the linear presentation show how this mode can be used to analyze an existing category of design.

Table 1

Order Mode

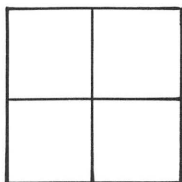
Maximum* or High Order		Minimum* or Low Order
orderly	— — — — —	chaotic
geometric	— — — — —	amorphic
formal	— — — — —	casual
modular	— — — — —	erratic
systematic	— — — — —	sporadic

Supports the notion of High Order

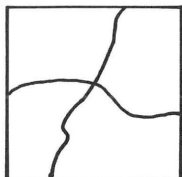
Supports the notion of Low Order

* Maximum and minimum, high and low are relative terms indicating opposite ends of the scale and do not indicate the desirability of a characteristic.

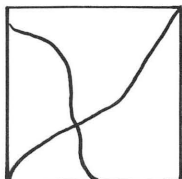
Figure 2
Order scale and its application in analyzing logotype design.



High Order (HO)



IBM

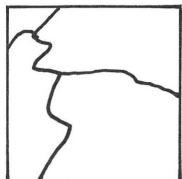


RCA



Medium Order (MO)

EAT•N



SHULTZYS



Low Order (LO)



Graphic Mode

The graphic mode describes the use and manipulation of basic visual elements such as line, plane, volume, color and value, texture, number of elements used (complexity), scale relationship, and juxtaposition.

The graphic mode, like the order mode, can be described with bi-polar adjectives which help to define the term graphic (Table 2).

The graphic mode also makes use of a sliding scale from the theoretic maximum⁹ to the theoretic minimum. Similarly, a graphic scale could be illustrated as follows (Figure 3). Again, existing elements from the world of communication design, i.e., abstract trade marks, show the application of the graphic mode as an analytical device.

Table 2

Graphic Mode

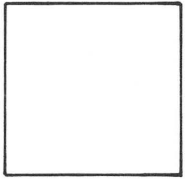
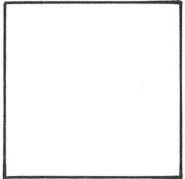
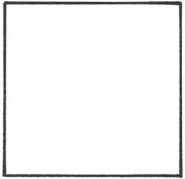
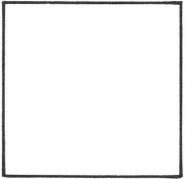
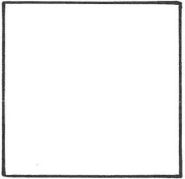
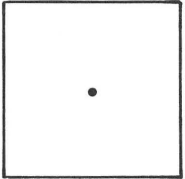
Maximum or High Graphic		Minimum or Low Graphic
spatial	— — — — — — — —	flat
heterogenic	— — — — — — — —	homogenic
active	— — — — — — — —	passive
bold	— — — — — — — —	weak
exciting	— — — — — — — —	dull

Supports the notion of High Graphic

Supports the notion of Low Graphic

Figure 3
Graphic scale and its application in analyzing abstract visual elements.

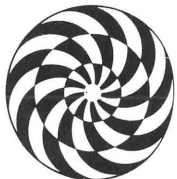
(The reader may fill in the rest of the scale.)



Low Graphic (LG)

Medium Graphic (MG)

High Graphic (HG)



Literal Mode

The third and last component of the Visual Differential is the literal mode. A conscious attempt has been made to avoid representing images of people, objects or places; that is, content was eliminated in order to keep a focus on the key idea of each of the two previous modes, i.e., order and graphic.

The literal mode, however, can be thought of as a scale of ambiguity with real, or content images at one end and no-content at the other. The semantic differential which supports these notions is shown in Table 3.

The literal scale can be further defined in a very simple way (Figure 4). The literal character of the bird symbols are apparent, and in relationship on the scale, clearly show alternative possibilities.

Table 3

Literal Mode

Maximum or High Literal	Minimum or Low Literal
representation	figurative
meaningful	meaningless
actual	symbolic
real	abstract
understandable	ambiguous

Supports the
notion of High Literal

Supports the
notion of Low Literal

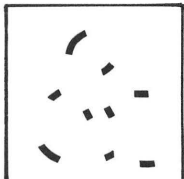
Figure 4
Literal scale and its application in analyzing bird-form trademarks.



High Literal (HL)



Medium Literal (ML)



Low Literal (LL)



Sign



Frank Lloyd Wright

Abstract

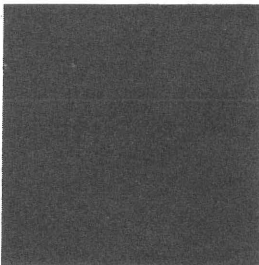


Figure 5

An example of literal scale played out using Frank Lloyd Wright as content for communication.

Drawing



To illustrate the literal mode in another way, consider an individual as an example on a scale from real to abstract (Figure 5). Real is physical presence and in terms of visual representation it is the least ambiguous. Less real on the scale would be a representational model of the individual or a robot made to represent physical attributes. Next would be a bit of film footage, a holograph and then a still photograph. With each change of code as we move toward the low literal end of the scale the potential for transmitting information about the individual decreases. A drawing or sketch transmits less to the decoder than the previous examples as will a mechanical drawing or a diagram of body functions. Next, design a sign or mark which represents the individual (for instance, a typographic sign could be a name). Last on the scale is an abstract image of the individual. This communicates only speculative and ambiguous information.

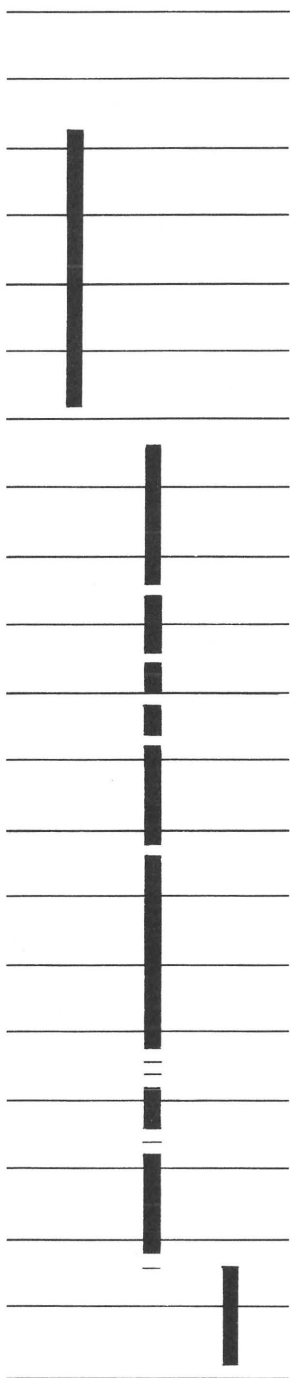
Diagram

Frank Lloyd Wright

Model



Photograph



1869 born

civil engineering student, University of Wisconsin worked in Adler & 1889 Sullivan Office

1892 Winslow House

1903 Larkin Building

1908 University Temple Coonley House 1911 Taliesin

1914 Midway Gardens

1922 Imperial Hotel

1937 Kaufman House 1938 Taliesin West 1939 Johnson Administration

1943 Guggenheim Museum 1944 Tower

1952 Price Tower

1959 died

Application

Experiments which focus on each of the three components of the visual differential are a means to expand one's visual vocabulary in a systematic way. For example, try studies using just color and form (no-content image) to create an illustration of high order. Next, create an illustration of high graphic. Each illustration can be attempted without regard to the other component. In this manner the effect of the isolated component can be more readily understood.

As soon as one becomes familiar with the independent effects of the order and graphic modes these components can be thought of as factors which operate simultaneously within a visual composition. The following example utilizes letterform as the element of manipulation (Figure 6). These nine permutations of order and graphic demonstrate some possible ways a systematic manipulation of letterforms can be achieved.

A single letterform can be said to have content as compared to an abstract form which verges on no-content. Some letterforms have greater potential for recognition than do others as well as increased potential for intelligibility. The letter I, for example, can stand alone as opposed to the letter, Q, which needs other characters to support it. The letterform H,¹⁰ as used in Figure 6, is a form (to people who use our alphabet) with some content and is therefore less ambiguous than a letter from a non-Roman alphabet. It is interesting to note that the manipulations consistent with the visual differential of order and graphic clearly affect the literal level of this letter. Stated in another way, the semantic of the letter H is affected by the aesthetic treatment employed. This will be generally true regardless of the image used or its literal level at the start of the manipulation.

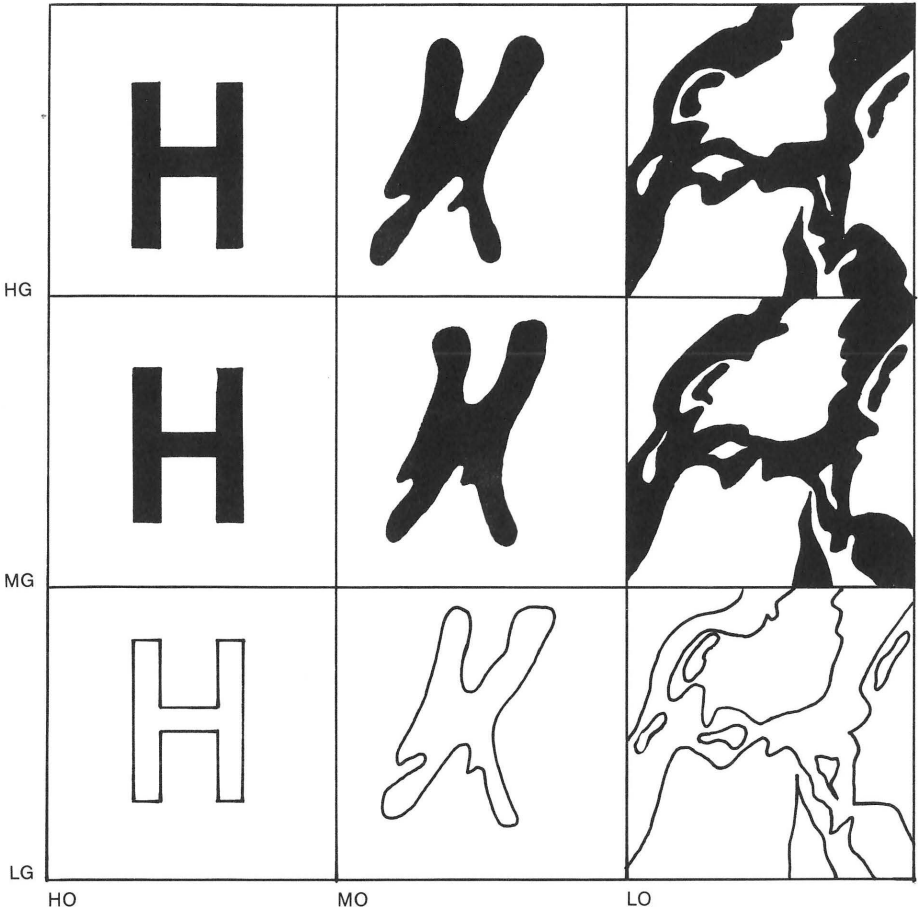


Figure 6
An example combining order and graphic modes.

As the visual information bit count increases in a potential message, the opportunity for greater variation in the image also increases. Manipulation of the order and graphic differential results in increased ambiguity, which is magnified by a high visual bit count. The more complex the message, the more delicate the relationship of the parts to the whole. Consequently, ambiguity can be more easily created in complex messages. This is more quickly noticed if the delicate balance of the syntax and content of the message is manipulated along with the visual order and graphic treatment. Examples of these kinds of manipulations can be found in commercial print advertising almost everywhere (Figure 7). In addition to the potential loss or distortion of information which often results from poorly managed designs, another effect is a loss of integrity of the merchandise or service advertised.

From assembly instructions, powerful advertisements, to expressionistic art forms, all kinds of visual communication can be roughly characterized as some combination of high, medium, or low, literal, graphic, and order. Specifically, information, persuasion, and stimulation design can be identified on the visual differential model in a general way and as such the model offers a guide to basic application (Figure 8).

As a design project or just as a mental exercise try to generate a list of examples that could fit specific areas of the model. What is (or could be) an example of high literal, high graphic, and high order? It is interesting to speculate like this with all twenty-seven permutations of the model.

Such design problems become the basis for a systematic study of the effects of visual manipulation on communication. Although it is fascinating to theorize about these results, the real value ultimately depends on reliable testing and application of the findings to the practical problems designers face.

WIN UP TO 1,000



0000
LICK
AGO

PICK UP YOUR
DOUBLE PUNCH
BOARD BINGO
COLLECTOR
CARD AT
YOUR NEARBY
DOMINICK'S!



\$1000⁰⁰
G. DYER
CHICAGO

\$1000⁰⁰
C. TOZER
WINNETKA

Prize Value
*1,000
250
100
50
10
5
...1
TOTAL

FREE
\$280,000
IN
CASH
PRIZES



\$1000⁰⁰
P. WATKINS
ELGIN

\$1000⁰⁰
E. HAROLD
HILLSIDE



ITEMS ON SALE THURSDAY JUNE 15
WEDNESDAY JUNE 21, 1978
OTHERWISE INDICATED.

DOMINICK'S RESERVES THE RIGHT TO LIMIT QUANTITIES ON ALL ADVERTISED AND FEATURED ITEMS.

dominick's
FINER FOODS

WIN!

- 1978 MALIBU WAGON
- SIX FLAGS WEEKEND

SEE DETAILS
ON BACK OF
THIS CIRCULAR

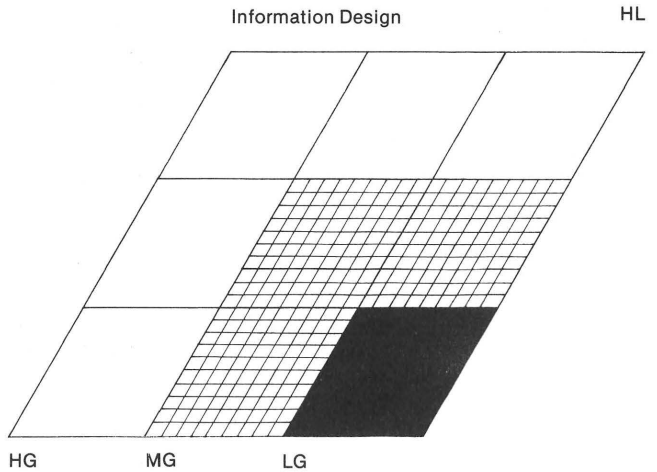
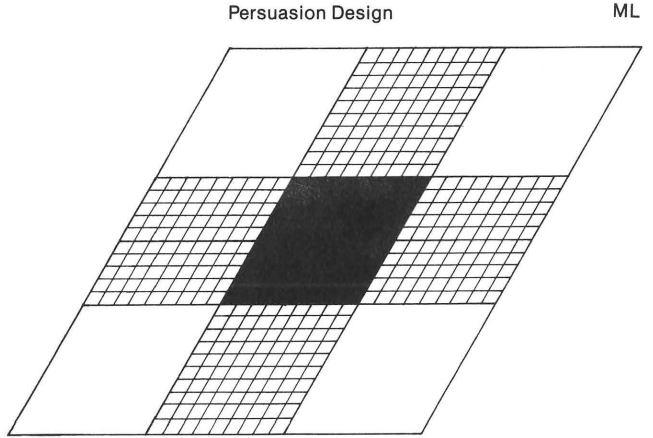
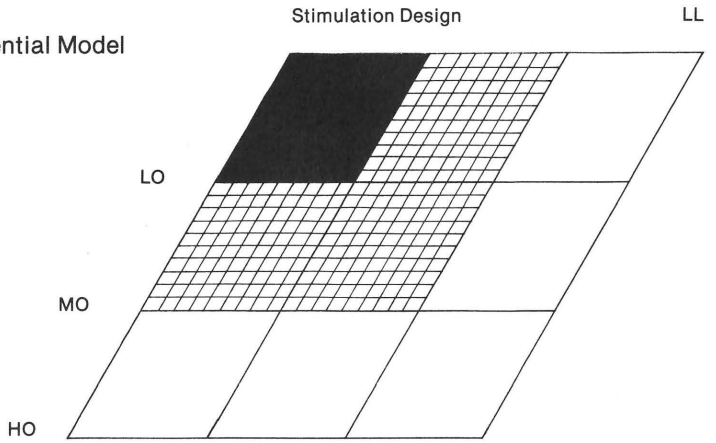


FASHIONED
TRY STYLE
ICED
CON

BLA

LIMIT
3
PLEASE

Figure 8
Visual Differential Model



Stimulation Design

Low Literal

Greater ambiguity results in a sense of insecurity and vulnerability. Provides a focus on form.

Low Order

Creates a sense of disorientation, diminished stability, and increased visual stimulation.

High Graphic

Contributes to sensory overload and anxiety.

Persuasion Design

Medium Literal

Provides literal options—some ambiguity important to persuasion process.

Medium Order

Flexible structure permits interaction between content and form.

Medium Graphic

Controlled visual excitation contributes to the persuasion process.

Information Design

High Literal

Real phenomenon or reliable representation provide content focus.

High Order

Supports presentation of information.

Low Graphic

Non-distracting graphic level supports a focus on content.

References

1

Osgood, C.E., Suci, G.J., and Tannenbaum, P.H. **The Measurement of Meaning**. Urbana: University of Illinois Press, 1957.

2

A similar example of this approach can be found in: **An Approach to Environmental Psychology**, Albert Inehrabian and James A. Russell, Cambridge: The MIT Press, 1974.

3

It is possible to add dimensions to the basic model. For example, the author has often used an aesthetic mode as a supplementary dimension.

4

The author is aware of the problem of semantics, that is, what should be called by what names. The words "order" and "literal" are usually defined by others in a manner consistent with the author, but difficulty is sometimes encountered with the term "graphic."

5

Correlation studies should be done to test the reliability of the words which are thought to be synonyms.

6

The SEMMAP program was used through the courtesy of its author, Charles Owen, Professor of Design, Institute of Design, Illinois Institute of Technology, Chicago.

7

It must be remembered that all the component names apply to the visual state. It is understood that there are other kinds of order than visual, i.e., mathematical, etc.

8

Visual order can be ascribed to both form and the position of form within a given space.

9

It is sometimes difficult to determine when an illustration has reached the point of maximum graphic. When the further addition of visual elements or increased juxtaposition yields no increased sensory stimulation for an individual observer, it may be assumed that the illustration represents an example of high graphic for that individual. It is the author's experience that a consensus of opinion can be reached in the determination.

10

The letterform "H" was chosen for use as an example because it is visually a high order configuration by virtue of design.