VISIBLE LANGUAGE 42.2

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ADVISORY BOARD

SKITTISH SKIRTS AND SCANTY SILHOUETTES: THETRIBULATIONS OF GENDER IN MODERNSIGNAGE

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ABSTRACT   Signage, traffic signs and way-finding systems are the focus. Whether the pictograms used in such systems may be said to work through mechanisms of visual metaphor or not is the question addressed here, they certainly use pictures of individual objects to express abstract concepts. This requires learning and context for understanding. Nevertheless pictography seems to have other limitations. When compared to verbal language, a major example of these limitations is the representation of gender. In 2005, a survey of 49 signage systems at the University of Aveiro concluded that the female gender was under represented, and heavily stereotyped. Notwithstanding, the article analyses a few recent attempts to use non-sexist traffic signs and signage, in order to determine whether it is possible to reform or improve pictographic languages.

INTRODUCTION

In the space of the modern city, at theaters, crossroads, shopping malls and airports one is surrounded by a multitude of commercial signs, traffic signs, semaphores and way-finding systems. Inevitable as they are, such systems employ pictograms, that is pictures of individualized objects that are used to express abstract concepts, and require learning and context to be understood. This article intends to reflect upon the way pictography far from being (as it was said to be, during the 70s) a 'universal,' intuitive language,[1] on the contrary seems to have some limitations as a communicational form.

Not only does pictography lacks universal reach—being dependent on specific cultural contexts—but its own universal pretensions, tends to result in the use of caricature and stereotyping when representing gender. In 2005, a survey of 49 signage systems and 767 pictograms undertaken at the University of Aveiro concluded that the female gender was underrepresented and also 'marked' in relation to the generic male form.[2] Thus, this more and more important area of information design, allegedly concerned with the quest for a neutral, universal language has its ideological moment, ineluctable perhaps, but one that is important to understand and document.

Recently, something unexpected happened: Fuenlabrada, a small town at the outskirts of Madrid, decided to use female pictograms in its traffic signs. Hence, some of the silhouettes in the 'pedestrian crossing' signs were given skirts (*figure 1*).[3]
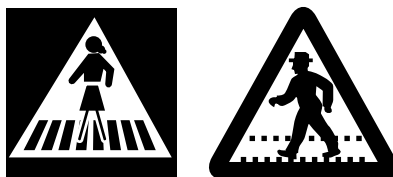

Figure 1 Fuenlabrada new traffic sign for pedestrian crossing (older sign on the right).

Banishing sexism from street signs was only part of a larger and more ambitious equality program by local authorities, and yet their move was received nationwide with mockery and anger. Despite many positive reactions—and general acceptance by local inhabitants—there was condemnation from conservative groups, right-wing opposition and even warnings by the General Director of Traffic, on the grounds it violated the Vienna Convention on Road Signs of 1968. Echoes of the heated debate reached neighboring Portugal.[4]

For some time in fact a few European cities have been using traffic signs and signage systems in order to question gender-based stereotypes. But are these changes a real solution? Is it possible to reform pictographic language?

FROM PICTOGRAPHY TO SIGNAGE

From the beginning of the 20th century, city growth, proliferation of administrative services, international trade and population mobility created situations in which national languages (or rather their correlative typographic characters), were sometimes replaced advantageously by small pictures, i.e., pictograms.

The first serious attempt to create an organized system of similar graphic signs was the work of Viennese sociologist and philosopher Otto Neurath.[5] Earlier in the 1920s, Neurath was convinced it was possible to create an international pictographic idiom,

1—See Krug, K.H. et al. Undated. *Pictogramas, Sinais de Comunicação*. Catalog from Instituto Cultural de Relações Exteriores /ERCO, p. 2; Costa, J. 1998. *La Esquemática: visualizar la información*. Barcelona: Paidós, p.89; Dreyfuss, H. 1984. *Symbol Source Book*. New York: John Wiley & Sons, [1972], pp.16 ff; Aicher, O. and M. Krampen. 1995. *Sistemas de signos en la comunicación visual*. Ciudad del México; Gili, G. 1995. Ciudad del Mexico: G.Gili, pp. 5, 129; Ota, Y. 1993. *Pictogram Design*. Tokyo: Kashiwa Bijutsu Shuppan, p. 18; Horton, W. 1994. *The Icon Book*, New York: John Wiley & Sons, p. 6.

2—Bessa Pedro, P. 2005. Representações do masculino e do feminino na sinalética. University of Aveiro, unpublished PhD dissertation.

3—Faldas para los pasos de cebra. 2006. *El País*, 11/11/2006. Rosalina Guijarro, the town counselor in charge of the project, said her ultimate goal was to have fifty percent of all signs and traffic lights changed.

4—Cidade espanhola adopta figuras femininas nos sinais de trânsito. 2006. *Público*, 12/11/2006.

5—See Lupton, E. 1989. "Reading Isotype." In Margolin, V., editor. 1989. *Design Discourse*, Chicago: University of Chicago Press, pp. 145-156.

Figure 2 Pictgrams designed by Otl Aicher for the Munich Olypics, 1972.

which he later called Isotype, and was mainly used in books, posters and statistical charts (For Isotype charts, see pages 168-173 in this issue.).

Neurath's project was related to his activity as a philosopher: he was a leading-figure of logical positivism, a philosophical movement which had among its objectives the search for an ideal language, descriptive and logical, thus superior to current language, considered to be full of imprecision and deficiencies.[6] Neurath believed Isotype was such a language, a sort of intemporal, hieroglyphic idiom in which it would be possible to transcribe all the languages of the world. This optimism remains at the very core of present-day pictographic signage and, to a certain degree, continues to inform the practice and teaching of graphic design.

Isotype was contemporary to the first international conventions for the unification of traffic signs and, in the following decades, the use of ambitious, encyclopedic pictographic systems was extended to transportation and to sport events (*figure 2*).

IDEOGRAMS, SYMBOLS AND ICONS

Some of the so-called 'pictograms' are actually signs with an extremely conventional or even arbitrary basis, for example, three triangles inside a circle meaning 'nuclear shelter.' But even in the case of more figurative or illustrative-type signs, one is faced with two different situations: the *literal meaning* of the sign and its *derivative meaning*.[7]

Examples of derivative meaning are the pictogram of a coat-hanger meaning 'cloakroom' (and not the coat-hanger itself) or the figure of a fork and a knife meaning 'restaurant.' Some authors prefer to call these figurative signs that express abstract concepts *ideograms*.[8] Most pictograms are in fact ideograms: another well-known case is the use of the pictogram of a man and a woman to denote 'toilets'; as a pictogram it reads 'man and woman,' as an ideogram it reads 'toilets (*figure 3*). One might call this a 'visual metaphor': something that literally denotes one thing is being used figuratively to stand for another. In fact, not only metaphor but metonymy—two rhetorical devices—are at play here.[9]

Neurath's interest in a 'scientific' visual language was common to much modernist art and design research.[10] In the early 1950s, Gestalt psychology dealt with something thought to be independent of cultural conditioning: visual perception. Information theory focused on the efficacy of the communication process: optimization of the channel

6—Granger, G. 1987. "Círculo de Viena." In Imbert, C. et al. 1987. *Filosofia Analítica*, Lisbon: Gradiva, undated, pp.83-86; Cordon J.M. and T. Martinez 1987. *História da Filosofia*. Lisbon: Ed.s 70, vol.III, pp. 149-59.

7—Or termed *dictionary-type meaning* and *derivative meaning*, from Ota, *Pictogram Design*, p. 118.

8—Frutiger, A. *Signos, Símbolos, Marcas, Señales*. 1999. Barcelona: Gustavo Gili, pp. 81-83; Lupton, E. and A. Miller. 1999. *Design Writing Research*. London: Phaidon, p. 48.

9—The use of a man-and-woman pictogram for 'public toilet' is a case of *metonymy*; the use of a male pictogram meaning 'people' is a case of *synecdoche*. Synecdoche uses a part of something to mean the whole thing. In metonymy the symbol one employs is linked to the concept one is talking about, but without actually being a part of it. But the difference is not always obvious, so many people use metonymy to mean both devices.

10—Lupton, E. and A. Miller. 1999. *The ABC of triangle, square, circle*. New York: Princeton Architectural Press; Golec, M. 2002. "A Natural History of a Disembodied Eye: The Structure of Gyorgy Kepes's *Language of Vision*." *Design Issues* 18.2, pp. 3-16.

11—Moles, A. 1958. *Théorie de l'information et perception esthétique.* Paris: Flammarion;
Moles, A. 1982. «A Abordagem Informacional.» In Dufrenne, M. et al. 1982. *A Estética e as Ciências da Arte.* Amadora: Bertrand, vol.II, pp. 300-27 ;
Kinross, R. 1989. «The Rhetoric of Neutrality.» In Margolin, *Design Discourse,* pp. 140 ff.

12—Peirce, C.S. 1931-1935. *Collected Papers.* Cambridge, MA.: Harvard University Press ; de Saussure, F. 1915. *Cours de linguistique générale.* Paris: Geneva.
Charles Morris, who worked closely with the neo-positivists of the Vienna Circle, used Peirce's definitions.

and reduction of noise. In both cases the message was regarded as nothing more than a neutral element to be transported from point A to point B.[11]

Also influential in graphic design education and practice, semiotics concentrated its attention on the message itself as well as on the receiver. To describe meaning, American philosopher Charles Saunders Peirce used a triangular model in which the sign/signifier, the signified and the referent (i.e. the material object the sign refers to) were at the vertices. Swiss linguist Ferdinand de Saussure, in contrast, postulated a dual structure: signifier and signified, indissolubly joined together. No referent here.[12]

Figure 3 Pictograms of a coat hanger, car and key, man and woman; the same signs read as ideograms: cloakroom, car rental, toilets (DOT system, USA, 1974-1979).

Although Saussure had little interest for the way signs related to readers (apparently unaware different readers will have different readings), he had the advantage of realizing that a sign has meaning only in relation to other signs: signifier and signified are always connected in an arbitrary way. The inclusion of the referent in the process ended up determining the search for a direct relation between words and objects, as in Logical Positivism's theory of language.

13—Eco, U. 1997. *O Signo.* Lisbon: Presença, p. 123. Eco refuses any possibility of a referential semiotics: all signs are conventional though not necessarily arbitrary, p. 153.

A key to this problem is the concept of icon.[13] Referential semiotics considers that a sign can be an index (a sign which has a physical connection to its object, e.g., a footprint), an icon or a symbol. Whereas a *symbol* is a sign whose relation to its object is basically conventional (letters, words), an *icon* 'resembles' or imitates the object it refers to. It was this distinction between icons and symbols that determined future attempts to substitute cultural conventions (letters) for analogical pictures. Isotype and pictographic signage rely on this principle.

Now, what may look like an icon is sometimes a *symbol*. It is the already mentioned case of the traditional pictogram for 'Public toilets.' Only in a very indirect, culture-laden way can that picture of a man and a woman somehow resemble its referent. Several designers and authors have proposed their substitution for more realistic representations, e.g., the inclusion of a toilet or a lavatory in the drawing.[14]

14—See Lupton and Miller, *Design Writting Research,* pp. 42, 48, 149;
Modley, R. 1976. *Handbook of Pictorial Symbols.* New York: Dover, p. x;
Ota, Pictogram Design, p. 119;
Frutiger, *Signos, Símbolos, Marcas, Señales,* p. 273. There is an old joke, among graphic designers, about a Scotsman and an Arab standing in line to use the women's bathroom because the only sign in sight is the traditional 'people wearing skirts' pictogram.

Figure 4 From left to right: urinal and sitting toilet, Munich Olympics, 1972, Otl Aicher; Japan, circa 1993, Yukio Ota; airplane signage, 1970s (from Dreyfuss, Henry. 1972. Symbol Source Book, New York, NY: Watson-Guptill, p.36).

All this contradicts the traditional thesis of pictography being an intuitive universal language, absolutely neutral in terms of the contents and meanings it transmits.

VISUAL METAPHORS: AN INADEQUATE TERMINOLOGY?

Metaphora brevior est similituto: a traditional view regarded metaphor as an 'abbreviated similitude,' the contraction of a comparison.[15] A rhetorical device whose broad definition might include many rhetorical figures, such as metonymy, hyperbole, allegory—metaphor was considered something built 'on top' of literal speech. It was at best an ornament to language, a poetic elaboration.

In the late 1970s and 1980s this was to change.[16] Linguists, George Lakoff and Mark Johnson, for instance, claimed metaphor was central to human cognition and everyday language: it allowed "mapping conceptual structures" from one domain to another, helping to understand new phenomena in terms of things one already knew. Then computer science took up the subject and the expression 'visual metaphor' became widely used in software visualization systems and interface utilities. As mentioned, rhetorical devices, e.g., metonymy, seem to be also at work in pictographic signage systems and traffic signs. Should metaphor have as central a role as Gestalt psychology and semiotics in defining a model for design education and methodology?

Essentially, a metaphor establishes an analogy between two concepts, technically called *tenor* and *vehicle*. And yet, this can happen in two ways. Consider two well know metaphors: "Socrates is a midwife," and "Humans are wolves to humans."[17] In the first case, a new idea is created from the merger of the two original concepts (Socrates + midwife = philosophical concept of *maieutike*). Whereas in the second case, one's understanding of the first concept, or tenor (humans), is somewhat transformed by consideration of the vehicle (wolves). The vehicle is introduced to deepen one's perception of an already existing concept rather than create a new one. What happens with poetic metaphors may be easily grasped if, instead of "humans are wolves", one considers a more poetic, though somewhat sexist example: Man Ray's *Violin d'Ingres* (*figure 5*), a case of visual metaphor, which might be translated as "woman is a violin."[18]

In contrast, the role of metaphor in human cognition and science are better described through computer interfaces, where one deals with abstract, sometimes radically new concepts. To a lesser extent the same happens in signage: how to represent the concept of 'car rental' by adding a second object (key) to the car. And in 'cloakroom' by using metonymy, the coat hanger works as a vehicle for something difficult to illustrate.

The parallel with standard metaphor terminology, however, is a bit artificial—one could simply say, for example, the drawing of a coat hanger has a 'double meaning' since it stands both for 'coat hanger' and 'cloakroom.' These literal and metaphorical meanings should then correspond to our *ideogram vs. pictogram* distinction. But a further problem arises when one realizes there may be inadequacy in describing visual images as tropes, and that 'visual metaphor' may not be a very reliable concept at all.

It has been argued that the primary means by which images convey meaning is directly representational and mimetic, rather than metaphoric. Thus, true metaphor is rare in traditional painting or sculpture (a few possible exceptions such as Man Ray's *Violin d'Ingres* and other surrealist imagery have been disputed). And yet others have argued all visual art is metaphorical,[19] and much the same has been said about graphic design and advertisement. Most authors take the expression 'visual metaphor' in a very broad sense; yet others developed a neat taxonomy of types, based on pre-existing categories of literary tropes[20]—a dependence that is in itself open to criticism. To speak of 'visual metaphor' then, means very different things, depending on the way researchers have defined the term. This gives a somewhat ambiguous quality to the concept.

On the other hand, if the presence of metaphor is dubious in visual arts, it is paramount in software visualization systems, given that they deal with highly abstract realities. Computer scientists and interaction designers tend to use analogies to natural

15—Aristotle, *Ars Retorica* 4, 1407a.

16—Black, M. 1962. Models and Metaphors. Ithaca, NY: Cornell University Press; see also "More about metaphor." In Ortony, A., editor. 1979. *Metaphor and Thought*. Cambridge: Cambridge University Press, pp. 19-43; Lakoff, G. and M. Johnson. 1980. *Metaphors we live by*. Chicago, IL: University of Chicago Press. A discussion on the relative merit of various metaphor theories, from Black's interactive conception, to "structure mapping theory," cognitive linguistics and "categorization theory," falls outside the scope of this article.

17—Socrates as a midwife: Plato, *Theaetetus*; humans as wolves: *homo homini lupus*, a Roman proverb by Plautus (*Asinaria*, 2, 4, 88), later used by Thomas Hobbes in *De cive*, *Epistola dedicatoria*.

18—Serig, D. 2006. "A Conceptual Structure of Visual Metaphor." *Studies in Art Education* 47.3, pp. 229-247.

19—Read, H. 1935. *Icon and Idea*. London: Faber and Faber; Hausman, C.R. 1989. *Metaphor and Art*, Cambridge: Cambridge University Press.

20—Kennedy, J.M. 1982. "Metaphor in pictures." *Perception* 11.5, pp. 589-605. For a similar approach see Horton, *The Icon Book*, pp. 42-45.

Figure 5 Man Ray, Violin d'Ingres, 1924.
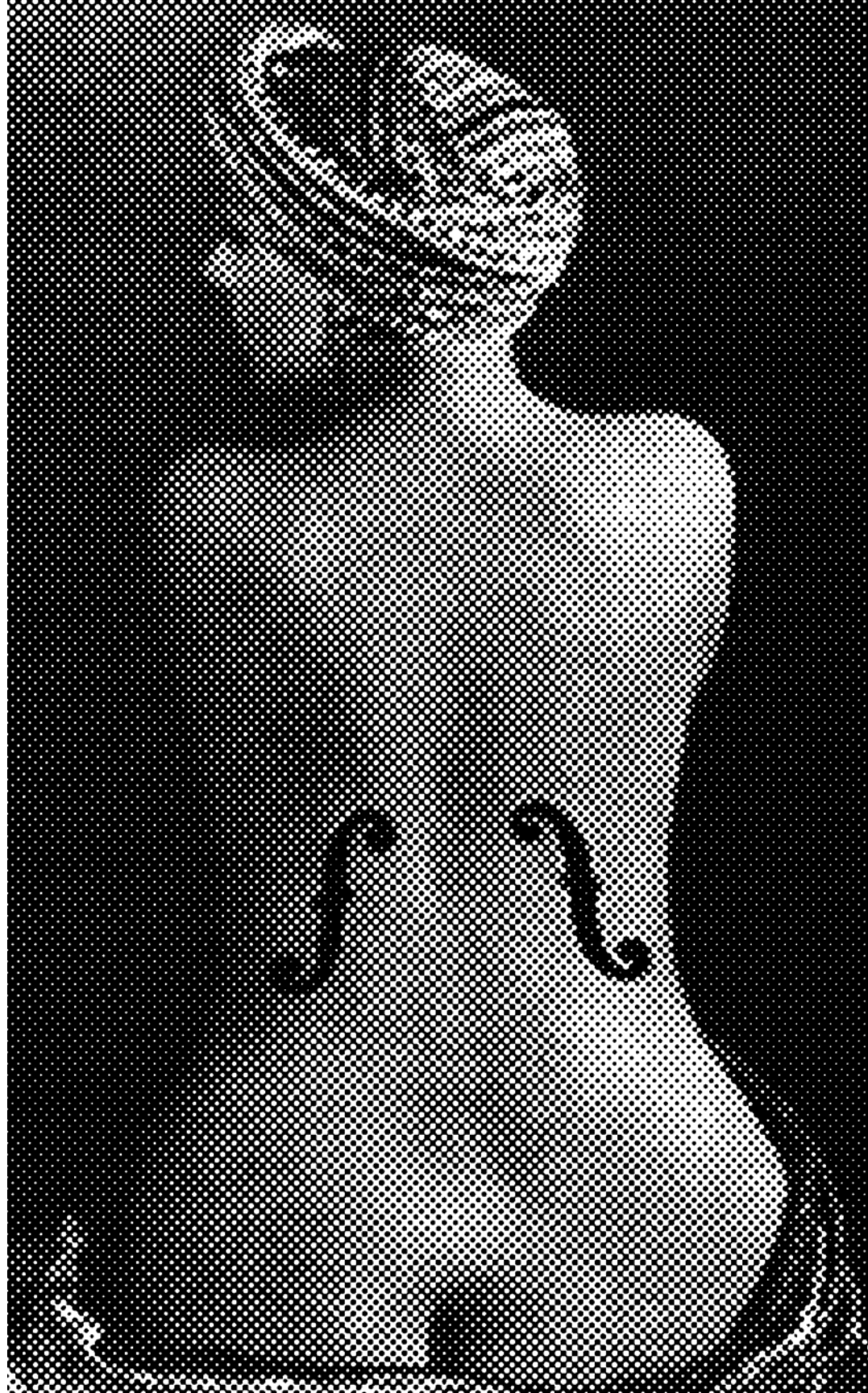
objects and phenomena: they speak of 'utilities,' 'protocols,' 'servers' and 'desktops' and use small graphical devices such as the 'wastebasket.'[21]

Yet, a final argument against using the expression 'visual metaphor,' when dealing with pictograms and other graphic symbols, is that metaphors and symbols evoke different ways of expressing meaning. Semiotic symbols have fixed, though arbitrary meanings; metaphors are open-ended, they permit additional, multiple meanings. Once they are arbitrary, symbols are replaceable; this is not the case with metaphors. In that sense, the 'wastebasket' in a computer desktop is a symbol not a metaphor.[22] 'Litter disposal,' a much less abstract concept in the NRS signage system (*figure 7, second pictogram*) is not understood metaphorically by most people.

MASCULINE AND 'FALSE NEUTER'

What we have then is that, on one hand, the alleged 'monosemy' of the pictograms[23] is illusory—how can we tell, in each case, if we are confronting a true pictogram, denoting the physical object thus represented or a more 'metaphorical' depiction, i.e., an ideogram? Only context allows us to decide. On the other hand, even *stricto sensu* pictograms do not seek to evoke a physical, unique object, but the whole group of possible objects belonging to a class. The pictogram of a table does not represent *a table*, but the group of all existent and possibly imaginable tables. But as Plato reminded us, every individualized object is limited towards the concept (*eidos*) it intends to illustrate. If the idea of 'table' is illustrated by means of a four-legged rectangular table, then the one-leg *ouija* table would be excluded; if the concept of 'people' is illustrated (as is common) by an adult male, then children and women would be excluded.

Moreover, the same graphic sign (or extremely similar signs) can, in the same signage system, accommodate different meanings. In each of Figures 6 and 7, the last two pictograms refer to one sex only ('Men's toilet' and 'Women's toilet'); but a male pictogram, depending on context, can also refer to people in general, i.e., both men and women (note especially the 'No entry' sign, *figure 6*). This happens because in verbal language the masculine functions as a sort of *universal signifier*. Using a terminology deemed to be inadequate, one could say the male pictogram is, most of the time, a metonymy for 'human race.' Rather ironically, on other occasions it is a metaphor for 'public toilets.'

Figure 6 Expo 70, Osaka, Japan, 1970, Isozaki Arata and Fukuda Shigeo.

Figure 7 National Recreation Symbols, USA, 1985, P. Singer and P. Reedijk.

21—Copper, A. "The Myth of Metaphor," *Visual Basic Programmer's Journal*, July 1995 has criticized the overuse of visual metaphors in computer interfaces. Although his criticisms may be fair, they sometimes tend to think of metaphor in a traditional way, i.e., as 'parasitic' on literal language.

22—As should be clear by now, in rigorous semiotic terms, the computer 'wastebasket' is not an icon either. Expressions such as 'visual language' or 'computer icon' have very specific meanings in the context of interface utilities. What one calls 'icon' in computers or small instructional buttons is generally called 'pictogram' in signage (although the two words may sometimes be used synonymously, e.g., see Pierce, T. 1996. *The International Pictograms Standard*. Cincinnati, OH: ST Publications.

23—Massironi, M. 1989. *Ver pelo Desenho*. Lisbon: Ed.s 70, p. 129; Costa, J. 1989. *Señalética*. Barcelona: Eds. Ceac, p. 141.

Comparing the relation between the two sexes to the one of two electricities, Simone de Beauvoir once said man represented "both the positive pole and the neutral"; to the woman it was left to be the negative, the 'Other' of man. That is why one says 'Man,' or 'men,' meaning the human race.[24] (*Figure 8* shows examples of this practice in pictography). In the 1980s, Portuguese writer Isabel Barreno used the expression 'False Neuter' to condemn this abuse of the male form,[25] a phenomenon that cannot be interpreted in pure linguistic terms, for it embraces a wider discursive practice, in a patriarchal culture that excludes or devalues women depicting them as *deviant* in relation to the masculine norm.[26]
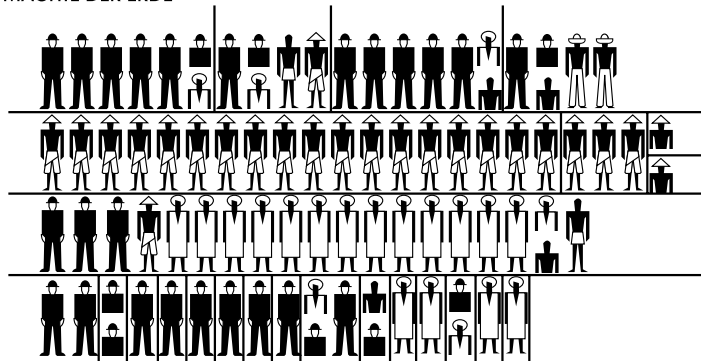
MACHTE DER ERDE

Figure 8 Isotype statistical chart showing the ethnic diversity of European empires; Otto Neurath, Die Bunte Welt, Vienna, 1929.

In the last few years there has been some effort to create alternative forms of speech in verbal/written language. Namely, replacing male expressions by more generic terms, without gender specification, to say for example, 'people' instead of 'men,' 'humankind' instead of 'mankind,' etc.[27] However, in pictography, collective nouns such as "people" are too abstract in the sense that, properly speaking, pictograms of 'people' do not exist; in pictography, all there is are men and women. It must have been this understanding that eventually led Fuenlabrada authorities to redesign their traffic signs.

GENDER MARKING

Men vs. women: binary oppositions enjoy a special status in linguistics and Structuralism. In fact, for some authors, they are "a property of human mind," the one and only way of producing meaning.[28] As binary digits (1 and 0) in computers language, male and female would only make sense contrasted against each other. And yet, associated with binary distinctions, there is a tendency to privilege one member of the opposition over the other. One tends to favor *high* in relation to *low*, *right* to *left*, *happy* to *un-happy*. This is the phenomenon linguists describe as 'marking.' Theoretically, unmarked words should possess a more neutral, universal status than the others.[29]

Thus, *fe*-male should be the marked form of *male* and, in fact, some grammarians[30] even developed a set of semantic categories for English language, which used *plus*-male and *minus*-male to distinguish masculine from feminine: males were supposed to be the standard of comparison for human species. Feminist authors, on the other hand, have frequently claimed the assumption of masculinity is not only the unmarked form, but is

24—de Beauvoir, Simone. 1975. *O Segundo Sexo*. Lisbon: Bertrand, vol.I, pp. 11 f.

25—Barreno, M.I. 1985. *O Falso Neutro*. Lisbon: Edições Rolim. In Portuguese, the word *neutro* can function both as a noun (neuter) and as an adjective (neutral).

26—See Cameron, D. 1985. *Feminism and Linguistic Theory*. London: MacMillan; Spender, D. 1985. *Man Made Language*, London: Routledge and Kegan Paul.

27—For a moderate, liberal approach see Miller, C. and K. Swift. 1981. *The Handbook of Non-Sexist Writing*. London: The Women's Press; a more developed analysis is in Cameron, D. 1994. *Verbal Hygiene*. London: Routledge.

28—See Lévi-Strauss, C. 1964. *Le cru et le cuit*. Paris: Plon;
Lacan, J. 1966. « L'instance de la lettre dans l'inconscient…. » In *Écrits I*, Paris: Seuil, pp. 249-289;
Leach, E. 1976. *Culture and Communication*. Cambridge: Cambridge University Press; For Cameron (*Feminism and Linguistic Theory*…, p. 58), it all relates to the "more general and conscious patriarchal policy of constructing a sexual dichotomy in every area of human experience."

29—Cameron, *Feminism and Linguistic Theory*…, p. 57-68;
Spender, *Man Made Language*, pp. 19-23.

30—Leech, G. 1968. *Towards a Semantic Description of English*. Indiana, IN: Indiana University Press.

"the assumption that the world is male."[31]

As Japanese designer Yukio Ota stated: "Differentiating between men and women is a design problem. Up to now most have used clothing to differentiate. But… there is the flaw of the figure as a whole becoming complicated in order to differentiate between male use and female use."[32]

In other words, the skirt (or the long hair, or breasts and buttocks; *see figures 9 through 11*) represents a kind of suffix or declension which makes the female pictogram marked; hence the difficulty in using it for 'people in general.' Through detail and complexity of drawing, the feminine becomes a particular case of the masculine. That detail is usually the skirt. Its presence is ubiquitous in pictograms, despite the great percentage of women who wear pants.

31—Spender, *Man Made Language*, p. 20. J. Stanley "Gender marking in American English", in Nilsen, A.P. et al. 1977. *Sexism and Language*. Urbana, IL: NCTE, pp. 44-76. Some theorize there is but a "negative semantic space" left for women in language.

32—Ota, *Pictogram Design*, p. 119.
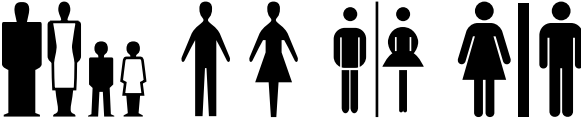
Figure 9 Marking through dress, from let to right: Isotype; ADV German airports, 1969, Krampen and Kapitzki; ERCO, Germany, 1976, Otto Aicher; DOT system, USA 1974-1979.

Figure 10 Marking through skirt and hair, from left to right: Mexico Olympics, 1968, D.L. Whyman and B. Cole; Netherlands trains, undated; IIT Hosp, India, 2002, Ravi Poovaiah.
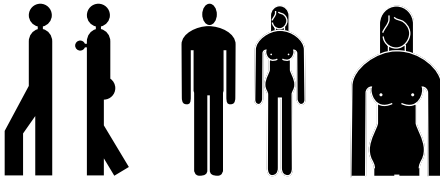
Figure 11 Marking through anatomy, from left to right: Nova Scotia Department of Tourism, Canada, 1970s; Medical Access, USA, 1985, Michael Everitt.

Figure 12 Various pictograms showing adults accompanied by children, from left to right: ADCA, Australia, 1972; Frankfurt Airport, 1970; New York City Hospitals, undated; KFAI, Sweden, undated; USA, circa 1990; GSO, Austria, 1980; Soccer World Cup, Japan, 2002; SN, Sweden, 1972.

But the skirt can also be explained by the intrinsically conservative characteristics of the medium. It is the same approach that dictates the use of obsolete steam trains to denote 'Train passage' along with other visual stereotypes. Ironically, in western countries trousers have been, for centuries, a symbol of male authority (the old expression 'wearing the breeches'), to the point they also became a token of women's emancipation.[33] This detail the design reformers of Fuenlabrada apparently overlooked.

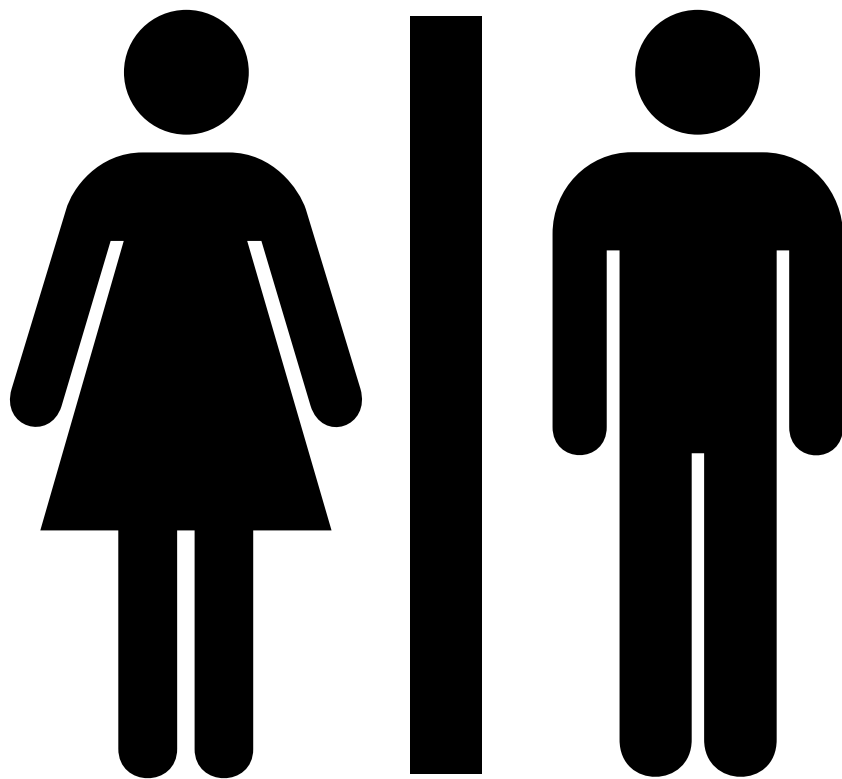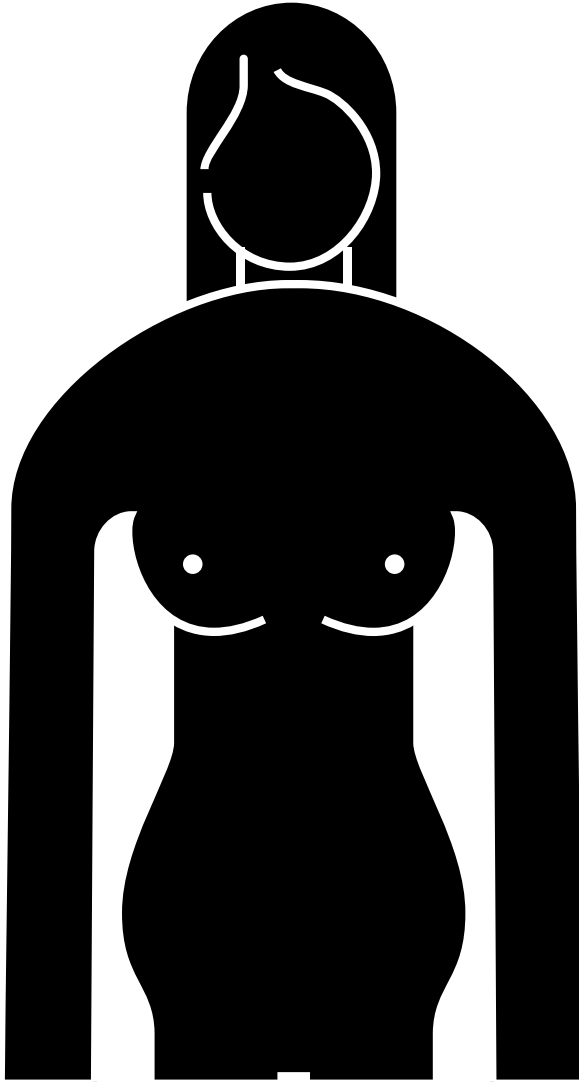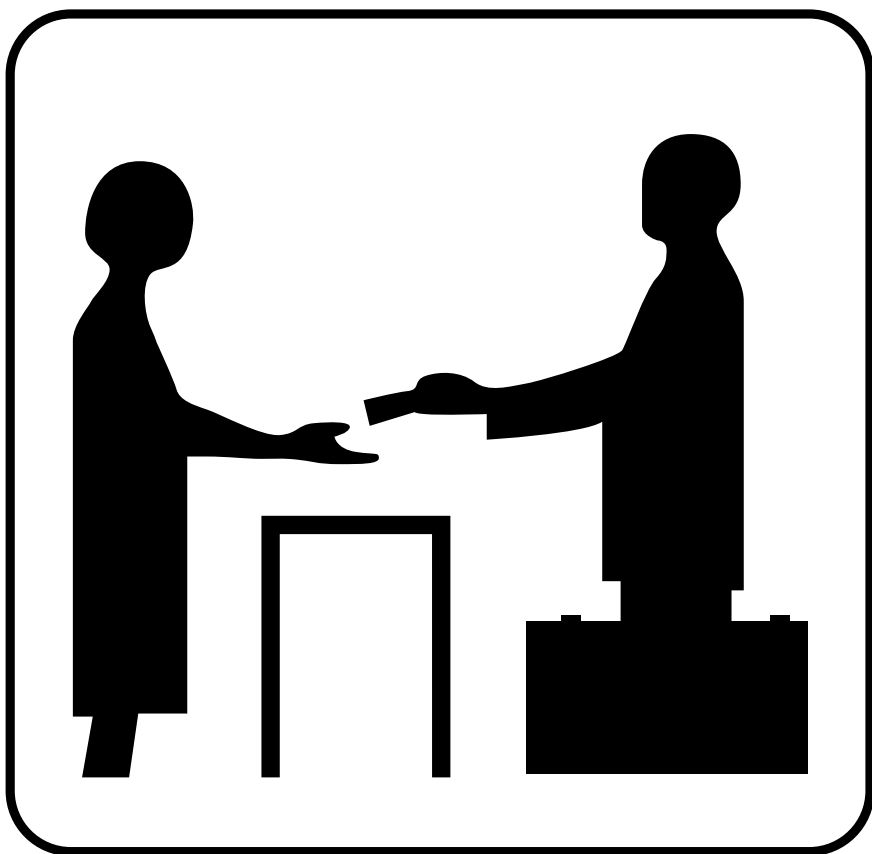33—Lurie, A. 1994. *El lenguaje de la Moda*. Barcelona: Paidós, p.250; Wilson, E. 1989. *Enfeitada de Sonhos*. Lisbon: Ed.s 70, p. 218.

CONTENT ANALYSIS RESULTS

In 2005, a content analysis of 49 signage systems from various countries, held at the University of Aveiro found a direct relation between the represented gender and its frequency. Table I shows the total number of pictograms depicting adult males and/or females.[34] As can be seen, the percentage for women is substantially lower than men, which results from the ambiguous 'universal' value attributed to the male form. Note the same does not happen, curiously enough, in the case of pictograms representing children (*table II*), where there is a balance between genders.

34—In some cases, a pictogram shows individuals of both genders; in others, it was difficult or even impossible to determine which gender was represented—these were registered as 'unknown.'

ADULTS	
Male	360
Female	87
Both Gender	60
Unknown	215
Total	722

Table I Number of pictograms depicting adults (or adults accompanied by children) in terms of frequency analysis by gender.

CHILDREN	
Male	9
Female	8
Both Gender	9
Unknown	41
Total	67

Table II Number of pictograms depicting exclusively children in terms of frequency analysis by gender.

To reinforce this phenomenon of semi-invisibility, the female gender when represented is always configured in very specific situations.[35] In the analyzed systems, two kinds of stereotyping were found. There is the invariable association of women to children or professions dealing with children. Not only does one find a much higher frequency of females among children than among adults, as mentioned, but also adult women are frequently shown accompanied by babies or toddlers (*see figure 12 and table III*).

35—On women's invisibility see Smith, D. "A peculiar eclipsing…." *Women's Studies International Quarterly* 1, pp. 281-96. At the centre of the female negative semantic space Stanley, ("Gender marking…") placed wife and mother and subordinate roles/ jobs. Lupton and Miller (*Design Writing Research*…, p. 42) refer to a similar situation in the DOT signage system.

ADULTS ACCOMPANIED BY CHILDREN	
Male	4
Female	13
Both Gender	3
Unknown	2
Total	22

Table III Number of pictograms depicting adults accompanied by children in terms of frequency analysis by gender.

Fig 13 From let to right: information services, check in/tickets or sales, hotel and hospital reception; all pictograms show a woman assisting a male customer. German airports, 1969, Martin Krampen and H.W. Kapitzki; ICAO, Candad, 1970 (two pictograms); Dallas-Fort Worth Airport, 1973, Henry Dreyfuss; EUA, 1995, Todd Pierce; Australian Standards, AS 2786, 1985.

Yet, there is also stereotyping in the way workplace gender roles are represented. Besides the already mentioned professions dealing with children, one finds numerous examples of so-called 'female jobs,' involving more or less subordinate tasks: receptionist, flight attendant, secretary, cleaning lady (*table IV*). Positions of leadership and authority are usually restricted to males. The profession of nurse, for example, is a feminine profession, while doctor is almost always represented by a man.[36] The same happens with the kindergarten educator vs. teacher, secretary vs. director, etc. In those cases where the interaction client/employee is represented, it often happens the person who waits, or assists male customers is a woman, whereas the opposite never occurs (*figure 13*).

36—In one case, the hospital signage system (designed by Ravi Poovaiah, Indian Institute of Technology, Bombaim, 2002) did distinguished between 'doctor' (male) and 'female doctor,' but also between male and female patients.

PROFESSION	MALE	FEMALE
Doctor	10	1
Nurse	-	5
Police officer, customs	27	-
Kindergarten personnel	-	6
Information services, check-in	3	8
Cleaning lady	-	3
Manager, director	3	-
Secretary	-	1
Flight attendant	1	2
Flight passenger	25	1

Table IV Main professions depicted in signage systems in terms of frequency analysis by gender.

Figure 14 From left to right: Ampellmann, Amep;fra and traffic signal from Amersfoort, Netherlands.

Our 'mental image' of an object is not, as Neurath believed, the direct result of our perceptive experiences of natural data; it rather implies complex cultural processes that include *clichés* transmitted by the media, education system, family and socio-cultural environment. When one merely sees the *iconicity* of pictograms, their apparent 'naturalness,' this becomes a dangerous obstacle to one's understanding of the world surrounding us. Once a figurative association is used for a long time, it becomes what linguists call a 'dead metaphor,' i.e., a metaphor whose origin one no longer recognizes. Similarly, visual stereotypes have become so overused one may be unable to identify them as such anymore.

Comparison between sign systems of different periods allows us to realize signage pictography is, in essence, conservative. This is partly due to characteristics of the medium itself. By technical necessity (to make the message simpler), pictography is more or less condemned to provide us with a caricature of reality.[37] Abrupt change in the symbol design might also result in confusion (or even danger, as in traffic signs) and loss of trust on the side of the user. Does this mean that all that is left for designers is to carry on their job, playing with stereotypes (that is, 'solid, fixed characters')? Or is it possible to modify this situation?

37—For a positive reference to pictograms designed as caricatures, see Dewar, R. 1999. "Design and evaluation of public information symbols." In Zwaga, H. et al. *Visual Information for Everyday Use*. London: Taylor and Francis, pp. 290, 298; also Costa, *Señalética*..., p. 141.

FIGHTING INVISIBILITY

By the end of last year, the small town of Fuenlabrada, south of Madrid, started the already mentioned campaign to change the traditional all-male pictograms in their traffic signs. This caused a national outrage.

And yet, though pioneering, Fuenlabrada's idea is not entirely new. For some time other European countries have been using gendered traffic signs. In Germany, the semaphore little 'green man,' originally from former GDR but currently extended to other places, is affectionately known as Ampelmann.[38] With his flat-topped hat and enthusiastic walk, this characteristic cartoon-like figure has become a kind of mascot for East Berliners. By November 2004, however, someone decided it was time to use this popular icon as a symbol of gender equality and his female counterpart, the Ampelfrau, was created: a child-like silhouette with braids and short skirt (*figure 14*). She was first introduced in Zwickau, then in Dresden in the next year. Since then, female traffic signal lights have also appeared in neighboring Netherlands, namely in the towns of Amersfoort and Utrecht.[39]

38—The Ampelmann (or *Ampelmännchen*, i.e., "traffic lights *little man*") was created in East Berlin in 1961 by Karl Peglau. In 1994, after reunification, it was to be replaced with the standard West German version. This sparked a vigorous campaign to save it. Since then, the figure has been restored at many Berlin crossroads and even extended to other places in Germany.

39—The Amersfoort traffic signal (*figure 14*) was first called to my attention by Piet Westendorp, whom I thank.

Why such a fuss with Fuenlabrada, then? On one hand, for cultural and even political reasons, it is not by chance that the Fuenlabrada local council is a left-wing coalition of Esquierda Unida and PSOE. More important, Ampelmann had always been regarded as a cute popular figure, with an important role in the East German nostalgia movement reflected by Wolfgang Becker's film, *Good Bye Lenin!* To give him a companion (the same way Mickey Mouse or Donald have their own cartoon-like girlfriends) would seem all too natural. Not so in the case of the politically loaded feminist action in Fuenlabrada.

Nevertheless, on January the 16th, new developments occurred: the Vienna City Council launched another egalitarian pictographic campaign.[40] Despite all the polemics surrounding it, the Fuenlabrada initiative had dealt only with traffic signals; this new project was apparently much more ambitious. *Wien sieht's anders* (Vienna sees it differently) dealt with public information and warning signs in general. It also did not want to simply show more women (to counter women's invisibility), but also to depict new, unusual images of men. The rare and rather stereotyped female pictograms would now have their male equivalents, questioning gender roles. Therefore signs such as 'Nappy-changing facilities' or 'Priority seating' (public transport) now show a father and

40—"*Ein neues Bild von einem Mann.*" *Der Standard*, 17 January 2007. In some aspects Fuenlabrada was more innovative: many of Vienna's pictograms were already known or had previously been tried in other countries.

child instead of a woman.

As in Spain, there were mixed reactions but, not unexpectedly, most of the negative criticisms came from men. There was also bitter reaction from the Austrian conservative parties and an unpleasant incident with some of the signs being removed a few days after because of European Union regulations (e.g., the 'Emergency exit' and the 'Roadwork' signs, *see figure 15*).

The Vienna campaign has undoubtedly very positive aspects—increasing the presence of female pictograms, showing men with children on signs—although one has a feeling that some of the new signs are rather problematic in that stereotyping and marking are paramount.
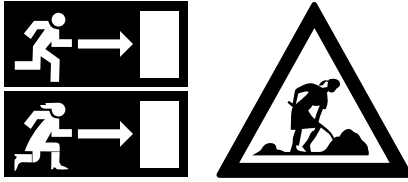

Figure 15 Pictograms for emergency exit and or roadwork, municipality of Vienna, January 2007.

A POSSIBLE CONCLUSION

In the study made at the University of Aveiro, it was possible to find some improvement in pictograms from the 1990s through the early 2000s, both in terms of women's invisibility and gender stereotyping, due to the introduction of innovative solutions. It was our conviction, however, that some of the problems raised by signage and pictographic languages were impossible to solve.

To the handful of non-sexist pictograms that were found, one could now add the new Fuenlabrada and Vienna signs: progress had been made. And yet, even these positive gender-inclusive pictograms are full of contradictions. Comparing, for instance, the old U.S. sign for 'Pediatrics' with a new one (*figure 16*), one might consider the later, unbiased and more 'politically correct.' The weak aspect is that this new pictogram mirrors ideological models of the well-balanced nuclear family. A colleague of mine, who is a single mother, told me she felt uneasy about such changes.

Figure 16 Pictograms for Pediatrics, New York, 1960s (in Dreyfuss, Henry. 1972. Symbol Source Book. New York, NY: Watson-Guptil, p.117) and Danville Regional Medical Center, Virginia, USA, 2002, Gladys Brenner.

The new pictogram for 'strollers,' in Oporto suburban trains may also look unbiased but ended up increasing women's invisibility (*figure 17*). Once again, male pictograms assume a 'universal' value at the expense of female ones, which completely disappear. Another example is the 'priority seating' sign. The new stickers updated the

traditional stereotype of a mother carrying a baby substituting it for a man with baby.[41] In this way, the unbalanced Oporto trains sign system managed to erase all females but the pregnant woman (*figure 18*).

Figure 17 The new all-man pictograms of Oporto suburban trains (2003), pictograms for wheelchairs, strollers and extra size objects (with detail).

Figure 18 The old and new stickers for priority seating in Oporto trains.

Similar problems surround the Fuenlabrada and Vienna projects. In both cases, a recurrent criticism was the new pictograms were stereotyped and sexist since they continued to represent women from the point of view of men: longhaired, stylish women, in high heel boots and dress. The skirt in the 'Roadwork' sign, for example, looks more like a sexist bad taste prank, than a serious attempt to raise awareness for gender inequality (*figure 15*).
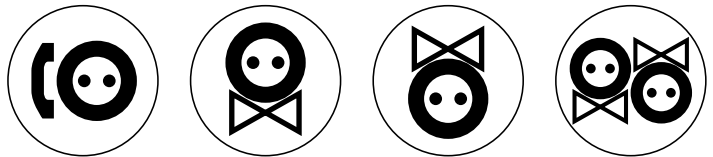
Figure 19 Pictograms for telephone, Gentlemen's toilet, ladies' toilet and toilet (in general), Expo 98, Lisbon.

The new pictograms are also gender 'marked' and, in fact, there seems to be no way to avoid using ponytails and/or skirts when depicting the female sex. Oversimplification and stereotyping, as we have seen, are to some degree intrinsic to picture language. To the point that it has been suggested that to install genuine gender neutrality, it would be necessary to restore some of the old 'marked' features of male pictograms: to make them wear the old-fashioned hats again; to give them bow-ties, baseball caps and male suits. This eliminates the old argument that the stick figures are not necessarily male ("they are too abstract," "they could be women in trousers"). An interesting example of such a strategy is the signage system designed by Shigeo Fukuda for Expo 98 in Lisbon (*figure 19*).

*Figure 20 No admittance, Soccer World Cup, Japan, 2002,
Kenzo Nakagawa and a hypothetical female version.*

The fact remains that language is not 'neutral.' As someone observed, "…while it may reflect reality in the sense that it reflects how we are organized in society, for the same reason, it does not reflect equality."[42] Society is still based on discrimination and unequal opportunities; thus 'political correctness' and feminist language reform is a way to change gender power relations. Until recently, shifts in pictographic signage remain a great deal behind the times. This is not due to ineptitude or design incompetence, but as was mentioned, to the characteristics of the medium itself.

There is little chance that, in the near future, every 'generic' pictogram can be changed into a female one. It is not easy, for example, to modify the 'No entry' sign (*figure 20*). If one intended to challenge the pseudo-generic male signifier, the resulting sign is somewhat ambiguous, introducing a restrictive meaning that the original did not have. It will very probably be interpreted as prohibiting the entrance, not to people, but *exclusively to women*. As mentioned, a male pictogram may refer to men or people, depending on the context (*see figure 6*). A female pictogram, however, will always be read primarily as meaning 'women.'

As Deborah Cameron said regarding the current discursive practice, "man can efface their masculinity but femininity can never be effaced."[43] And yet, language both encodes and constructs social reality. By constructing alternative, if provisional, discourses one is contributing to undermine those linguistic structures and processes that play such a central role in the maintenance of gender inequality.

Perhaps as important as mainstream projects, with their inevitable long-term shortcomings of passive acceptance and indifference,[44] are the apparently minor gestures of obscure global-resistance groups to reclaim public space. Thus the recent trend by anti-globalization activists and feminist groups is not to simply deface or vandalize sexist commercial ads, but to intelligently subvert them. The same strategy has been applied to signage. A recent example was the campaign of a Portuguese feminist group involving the addition of yellow skirt-stickers to the all-male traffic signals and information signs.[45] Confronting people with unexpected re-gendered figures, which collide with their visual habits, may be highly effective in terms of changing perceptions (*figure 21*).

42—Goddard, A. and L. Patterson. 2000. *Language and Gender*. London: Routledge, p. 73.

43—Cameron, *Feminism and Linguistic Theory…*, p. 69.

44—Last March, after new controversy, the municipality of Fuenlabrada finally managed to change its signs. According to *El Pais* ("Hay una mujer dentro del semáforo", 2/3/2007) many inhabitants did not notice the changes.

45—Colectivo Feminista, September 2006, http://colectivofeminista.blogspot. com/2006/09/nova-coleco-outono-inverno-2006.html

Figure 21 Street action by Colectivo Feminista, September 2006.

To conclude, pictography has obvious limitations (as well as advantages) when compared to verbal languages. A major example of these limitations and difficulties is the representation of gender. Awareness of this fact is important as it allows resistance to idealizing visual languages and metaphors as if they were a magical solution to the

problem. Needless to say, however, these communication forms are indispensable in our modern world and are here to stay.

AUTHOR NOTE

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LANGUAGE IMPAIRMENT, FAMILY INTERACTIONAND THE DESIGN OF A GAME

GUILLERMINA NOËL

ABSTRACT   This case study describes a user-centered design approach in the area of aphasia. Aphasia is a language impairment that can take many forms, so a particular case provides the foundation for this work. The particularities of the individual with this condition and his social context are key to developing and designing an intervention that supports language use and fosters interaction. This article takes the reader through a research process that results in the production of a board game.

This project began with the identification of aphasia as an area with needs, to which visual communication design could make a positive contribution. I recognized the language impairment suffered by people with Broca's aphasia and the consequent lack of interaction with others as important problems, and proposed game-playing and the design of a board game (that involves written and spoken words) to increase opportunities for people with Broca's aphasia to interact with the family and with language. Given the variety among aphasia cases, the project focused on one specific case: an intellectual in his seventies who suffers from Broca's aphasia that in this article will be identified as AM.

The main objective of the game was to increase AM's opportunities to interact with family members. The game *Questions & Answers* was created considering AM's abilities and disabilities so that he could be a successful player, and AM's interests so that he would be motivated to play. The project uses a user-centered design approach, which is critical when working with specific needs and with a disorder like aphasia that varies from case to case.

Two game prototypes were designed to assess size, format, color, typeface selection and other design decisions before the final design. Interviews were held with leading experts in aphasia and in design. Overall, responses by the experts supported the effectiveness of the design strategy. A conversation with the intended user, and his interaction with the prototypes, showed that a board game could increase his opportunities to interact with his family and with language.

As a result of the evaluation, a set of guidelines and a series of recommendations were developed.

WHAT IS APHASIA?

Aphasia is a communication disorder caused by brain damage that effects speech, writing, reading and auditory comprehension to some extent. A person cannot be born with aphasia, it is necessary to have some language in order to acquire the disorder.

Most aphasia cases are caused by stroke. In less than one second the language system is partially or completely damaged. Aphasia can have a devastating effect on the individual's life and his/her entire family.

A feature of aphasia is its variety, and the nature of the impairments depends on the location and size of the lesion. Some people can pronounce only a few words, others mistake words, others cannot speak at all; some cannot read, others can read nouns better than verbs; some cannot write, others can write names; some cannot understand what the other person is saying.

As indicated in the introduction, given the variety among aphasia cases, the project focused on one specific case: AM is an intellectual who suffers from Broca's aphasia. People with this kind of aphasia have their speech reduced to a few words that are pronounced with effort. Basically they cannot verbally construct a complete sentence, they can respond with one or two words, mainly nouns. Writing is normally as impaired as speech. Auditory comprehension and reading are usually intact. This aphasia may be accompanied by paralysis or weakness of the right arm and leg.

Although two people can have the same kind of aphasia, the two cases can be very different. AM was a lawyer and a historian in his seventies when he suffered a stroke. His main activities were to interact socially, to work as a consultant and to read. After the stroke, AM's speech was cut off, his writing abilities were erased, his social life was gone, his professional life finished and he was full of sadness.

The main feature of Broca's aphasia is that it impairs speech, the instrument we use to communicate and socially interact with others. On this topic Hall proposes (1959, p.38):

To interact with the environment is to be alive, and to fail to do so is to be dead. ...One of the most highly elaborated forms of interaction is speech, which is reinforced by tone of voice and gesture.

WHICH IS THE PROBLEM?

While the type of language impairment differs among cases, those affected by aphasia share similar feelings: sadness, anger, loneliness, depression, frustration, social isolation, fear, uncertainty, anxiety and humiliation.

Returning home is a strong event for people with aphasia; it is at home where the language and physical impairments become exposed. When returning to work full time becomes impossible, financial problems often emerge, increasing the feelings of frustration and despair. Daily life is full of free and unstructured time, but given the impairment, spending time is a difficult task.

Aphasia affects the ability to interact with others, forcing people to stop joking, arguing or chatting with a partner, meeting with friends or playing with grandchildren. Since communicating is frustrating, people with aphasia may not only withdraw from previous social activities and interests, but they may also avoid using language and performing activities where the use of language is necessary.

Family and friends need to adjust to the new situation, look for alternative activities to do at home and provide a supportive context that will increase opportunities for interaction. Simmons-Mackie (2001, p.256) suggested that:

Partners need to learn how to create an interaction that feels natural and reinforces the confidence and autonomy of the person with aphasia.

Activities are good at providing spontaneous interaction. Communication takes place in the context of activities. In the area of aphasia, activities of choice should be meaningful to the people affected, should provide a supportive context that will encourage the person with aphasia to participate, and should be accessible, recognizing the abilities and disabilities of the person with aphasia.

COULD A BOARD GAME HELP?

When speaking is not possible, or could be frustrating, what kind of strategies can help provide a structure similar to a conversation?

AM used to play games often with the family before his stroke. The topics and formats of the games were varied: cards, dice, dominoes, "Pictionary" or "Trivial Pursuit."

Playing is an activity with significant social function, and its structure could be considered close to that of a conversation. Playing occurs in a meaningful environment, it involves equal and shifting social roles, and varied discourse structures, such as performing actions, joking and gesturing. When playing, first it is your turn, then mine; when conversing first you talk, then I talk. Playing and conversing are constant chains of interactions.

Games are used in education to deliver content in a collaborative environment. The idea of playing has been used in psychology to cope with illness, facilitate family communication and solve family problems. In aphasia therapy, games allow adult

patients to joke and interact with other adults, providing a context in which to express ideas (Boehler, 1984).

A game structure could not only offer possibilities to facilitate family interaction, but also language interaction, through exposure to written and spoken words.

In treatment procedures for reading impairment (*alexia*), reading the same text, oral reading and presenting written words on cards for brief periods have proved beneficial. Beeson and Hillis (2001, p.575, 580) explained:

> Repeated reading of the same text facilitates a shift from letter-by-letter reading to whole-word reading because of clues provided by sentence context and familiarity with the text.

> It appeared that brief exposure presentation coupled with corrected oral reading served to strengthen specific graphemic representations (or access to them).

Both the game and the activity could, therefore, create a situation that is supportive and encouraging for AM to interact with his family and with language. A system is therefore created comprising: a tool, in this case a game which facilitates an activity; the activity itself, the playing of the game; and the interaction of the family, facilitated by the playing of the game. The tool, the activity and the family interaction create a situation, structuring the environment in a certain way. If the system is altered, interaction might not be facilitated.

The characteristics of the game to be designed should be based on AM's profile, recognizing his abilities and disabilities so that he can play with confidence and success. The game should also be motivating for AM and his family; and it should provide opportunities for language interaction.

MAIN RESEARCH QUESTION

One of the main objectives of the project was to design a game for people with aphasia, however, I identified a general lack of principles regarding the design of materials, not only games, for these people. Consequently, the main research question that I formulated in order to guide my project was:

> How could visual communication design guidelines be developed for the design of a game to increase opportunities for people with Broca's aphasia to interact with their families and with language?

WHICH RESEARCH METHODS TO USE?

Heuristic evaluation / Expert interviews

In this project, experts in aphasia and in design evaluated the game prototype so that problems could be spotted before the project would be presented to individuals with aphasia. The evaluation was developed during interviews. The experts' comments were verbalized while an assistant and I took notes. The meeting with each expert lasted between one and two hours. To guide the interviews a questionnaire was developed based on a list of topics that emerged from assumptions I developed and uncertainties I identified.

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Literature review

To understand and learn about aphasia, I received a reading package from one expert, who also recommended books and articles to read. The reading package was not only efficient for understanding the area, but also for identifying other sources mentioned in the reference lists or in the bibliography of the articles enclosed. To find information for the development of the prototype, a literature review was conducted related to aphasia, design, typography and games.

ABOUT THE DESIGN OF THE PROTOTYPES

Based on the literature review, on knowledge about the user and about design, two prototypes were created (named after the fonts used in their design). The first one called *Goudy*, was later modified creating a second option called *Century*. Both prototypes, *Goudy* and *Century* were shown to the experts in design and in aphasia for advice.

The general design questions were how the game might work and how the game might look. All the questions below were conceived to generate responses related to the intended user.

– How to make the content appropriate and relevant?
– How to make the game adaptable to the needs, skills and interests of the user?
– How to make the elements of the game easy to handle?
– How to make the text comfortably readable?
– How to make the game appealing to the users?
– How to customize the topics?

The content

A literature review provided a possible base for the content of the game. A treatment developed by Helm-Estabrooks and Nicholas was identified as a possibility for the content. *Sentence Production Program for Aphasia* (SPPA) has eight different types of sentences and two levels of difficulty. The aim of the treatment is to improve sentence production in individuals with non-fluent aphasias, which includes Broca's, with an emphasis on functional communications (Helm-Estabrooks and Albert, 2004).

One kind of sentence, *wh–* interrogative sentences (what, who, where and when), at one level of difficulty (level *A)*, was selected to develop the prototype. The goal of the treatment program at the first level is to repeat the key sentence in response to a question. In the *Goudy* prototype, the sentences were very close to the samples proposed by Helm-Estabrooks and Nicholas. Instead, for the *Century* prototype, the texts were shortened. As part of the process of customization and to increase the user's motivation to play, the characters were named after some of his family members.

The elements of the game

To adapt the treatment, the game has question cards and answer cards. The cards have enough space for short sentences, while being close in size to the standard playing cards. If the cards were too big, the game will not look appropriate for adults, and the board will cause problems when using it on tables. A board helps provide a structure to follow the different steps of the game and helps the game look like a game.

A rack facilitates holding the cards for the player with aphasia, avoiding the use of the right hand, while helping him see and read several cards at the same time. A pair of tokens shows who is winning, avoiding confusion and note taking. Given that the person with aphasia has problems with the right hand, the token is on the left of the player (*figures 1 and 2*).

The text

The first step in designing the text was to determine what the user could read. The second step was to consider AM's type style preferences, assessing his age, profession and topics of interest when reading. It was assumed that he was used to reading, and consequently preferred, text set in serif typefaces. When working with stroke patients, it is important to have a typeface with good differentiation between letters. The typeface selected should have distinctive characters; serif typefaces have, in general, more distinctive characters than sans serif fonts.

Under normal circumstances when we recognize a printed word we access its meaning. If the ascenders and descenders are short, word recognition is more difficult. If the word is printed in capitals, the word profile is eliminated and reading is more difficult (Spencer, 1968; Reynolds, 1984; Hartley, 2004). Following this idea, it was important to use upper and lower case, and to select a typeface with visible ascenders and descenders to facilitate word recognition, and activation of meaning.

Reading comprehension is affected to some degree in most individuals with aphasia. The impairment will differ among cases, but some patterns can be recognized. It could be that:
- the vocabulary of written words has been eroded,
- to recognize a word it is necessary to spell it letter-by-letter,
- in order to recognize a letter it has to be traced on the patient's hand,
- patients have problems activating meaning and sounding out words, or
- oral reading is affected.

In most cases the length and the frequency of use of the word should be controlled; long words and low frequency words can be a problem. In cases with an impairment of semantics, words that are semantically related (cat-dog), that look visually similar (same-some), verbs (walk-walked) or prepositions (under-until) can be confused (Beeson and Hillis, 2001).

Considering the patterns of reading impairments in people with aphasia, the *Century* prototype has increased spaces between words to facilitate word recognition. The space between words is constant, to favor legibility (Wiggins, 1967).

Walker (2005) found in her study with children that wider word spacing was helpful for some children; it facilitated word spelling. Bever, Jandreau et al (1990) demonstrated that poor readers do better when increasing spaces between words isolate major sentences. Word spacing should clearly separate the words without disrupting reading (Reynolds, 1984).

It is possible that adults with aphasia have visual impairments, as many other adults do, but they are not able to verbally express the impairment. Prince (1967) advised enlarging the size of punctuation, since it is a subject frequently commented upon in reading tests by people with and without visual impairments. He suggested that the period should be 30 per cent of the height of the lower case "o."

Written language is parallel to speech. Its visual appearance, the layout, should have a clear and accessible structure, helping direct the reader through the text. Waller (1987) called the use of layout to shape arguments 'text–as–diagram.' In a diagram, conceptual relationships are represented by perceptual principles such as proximity, similarity and closure as described by Gestalt psychology.

The reader's performance depends not only on typographic decisions, but also on several other factors like the reader's knowledge, the reading situation and the reader's motivation (Klare, 1984). Klare advised against including new words that the reader does not already have, since it could negatively affect the reader's performance. The reading situation, in this particular case is not a stressful test, but rather a playful

Figure 1
The main activity of the game is to pay attention to questions and to find the right answer. It can be played by 2 or 4
players, and it involves looking, searching and interacting.
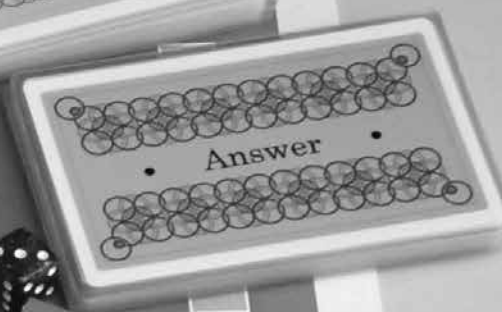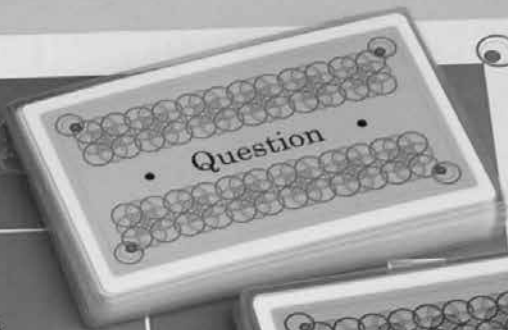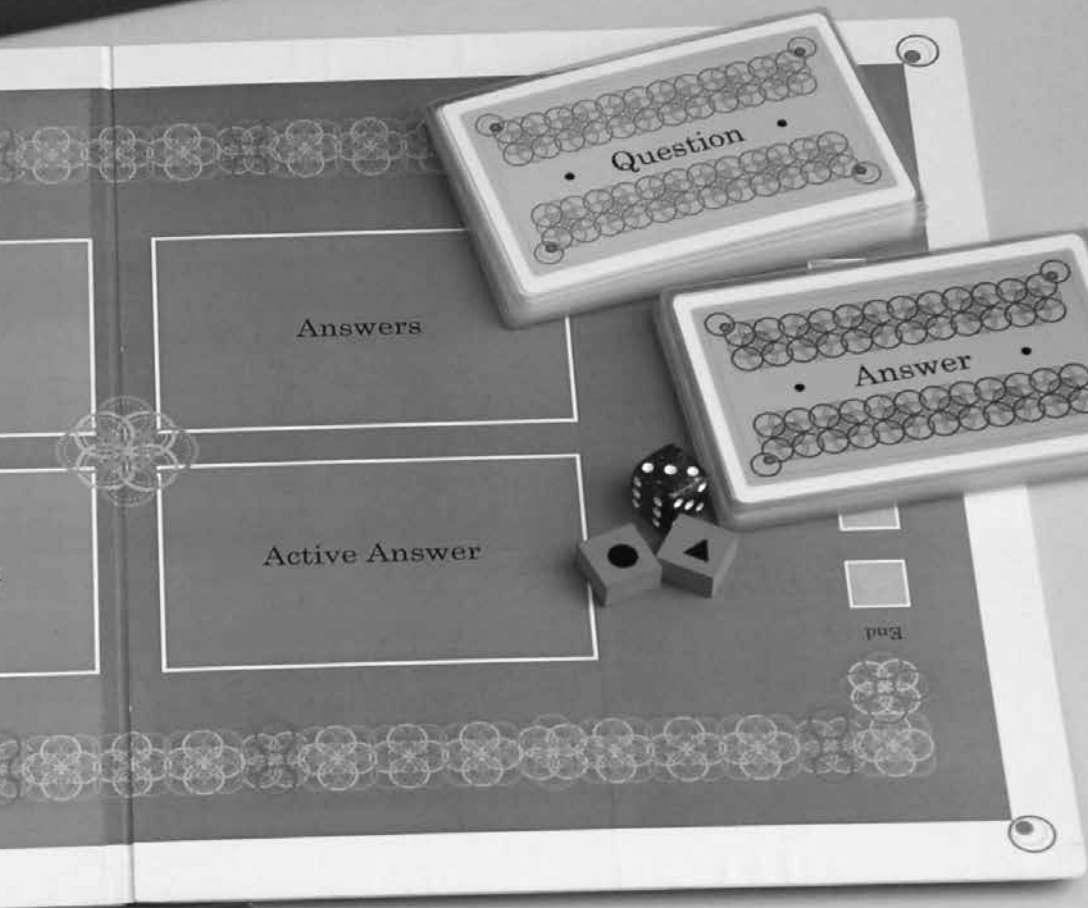
Answers

Active Answer

Question

Answer

End

Answer

Ans

Question

End

Beginning

Dee is writing on the board
Dave asks:

What are you writing?

What does Dave ask?

|:|:|:|:

What are you cooking?

||.:||.:||.:||.:||

When is t

Answer

Answer

Answer

Active Answer

he class?

Who is cooking?

situation that is relaxing. This could foster the reader's motivation, consequently benefiting the reader's performance.

Considering that some individuals with aphasia could have severe reading impairments, a set of patterns was developed to facilitate playing the game by matching patterns, rather than by reading alone. Reading impairments do not necessarily affect pattern perception. According to Julesz (1971), pattern perception is considered spontaneous and requires no learning. Pattern matching is simpler and more accessible than reading, and could help build the confidence of people with aphasia when playing the first level of the game.

The patterns are located in the bottom right corner of the cards; in the Western reading sequence, one begins at the top left and ends at the bottom right. In this way the game invites the users to first look at language (the text) and then attend to the pattern as a final step. The orientation of the patterns is horizontal.

EVALUATING THE PROTOTYPES

Through literature research, some authors were identified as possible experts to contact. Interviews were conducted with seventeen leading experts, people recognized internationally in their fields for their substantial publication records, or professional activities. Eight experts in aphasia and nine experts in design were consulted for their opinions about the prototypes.

The 'Expert interviews' were aimed at collecting opinions from experts, based on their knowledge and experience.

A list of questions was used to guide the experts to focus on certain aspects of the project. These related to playing as an activity to facilitate family interaction for people with Broca's aphasia, the idea of customization, the content, the typeface used, the colors, color to facilitate matching, patterns to facilitate matching, the size of the cards and the board, the use of racks, the layout, the grammar of the sentences and typography.

ANALYZING THE DATA

The first step in the analysis was to select recurrent ideas and units of meaning in the responses and also the reasons behind them.

These units of meaning, expressed in short sentences, were organized in charts under the main subject they addressed (i.e., about the idea of customization). The next step was to understand the main concept behind the units of meaning. All the themes were explained and their relevance and interpretation were analyzed to construct arguments that helped to confirm assumptions and reduce uncertainties regarding the development of guidelines for the design of games for people with Broca's aphasia.

CONCLUSIONS

Overall, responses by the experts in aphasia and in design confirmed that game playing could be an activity to facilitate family interaction for people with Broca's aphasia, and that customization is essential to support the varieties of aphasia. The responses also supported the effectiveness of the design strategy, confirming the assumptions I had. The following guidelines summarizes the findings:

Game playing could facilitate family interaction if the family used to play before the stroke.
– The game should be appropriately designed for people with aphasia, and the family should be instructed about the main purposes of the activity.
– The activity could help avoid social isolation, encouraging people with aphasia to participate in group activities and prompting them to process language, to use nonverbal cognitive skills and to show their preserved skills (those unaffected by the stroke).
– Playing with an appropriate game would promote the wish to communicate without feeling frustration, having favorable psychological consequences.

Customization is essential in relation to motivation and to the specific language deficits the person with aphasia suffers.
– Customization seems to be the strategy to approach varieties of aphasia.
– Customization makes the game more relevant and it carries the connotation of being something special.
– The main problem that customization presents to the production of the game is how to make it adaptable to different persons with aphasia.

The use of color could facilitate matching question cards and answer cards, only if the person is not color-blind or does not have visual problems.
– Given the subtle differences among the colors used in the prototype, the use of color to help matching might not work.
– If the goal is language interaction, through exposure to written and spoken words, color should not be used as a matching tool.

A pattern might facilitate matching question cards and answer cards even if the person with aphasia is color-blind. However, it cannot be said that it will work in all aphasia cases.
– The pattern will allow people with severe reading impairments to play the game, despite their difficulties with language.
– If the goal is reading comprehension, the pattern should be removed.
– The patterns should be different from one another, different from the form of letters, and all should have the same tonal density.
– It would be an advantage if the patterns could easily be described verbally.
– The pattern should be clearly separated from the text.

Increasing the size of punctuation marks could be beneficial, facilitating the recognition of periods, commas and semi-colons.
Increasing the space between words seems to be effective, facilitating the recognition of words.

Color seemed to be an essential element in games' aesthetics helping games to look appealing to the users.

To use the names of the family members could be an advantage, only if they have a good relationship with the person with aphasia, and if the person with aphasia does not have problems with proper names.

A conversation with the intended user also supported the effectiveness of the design
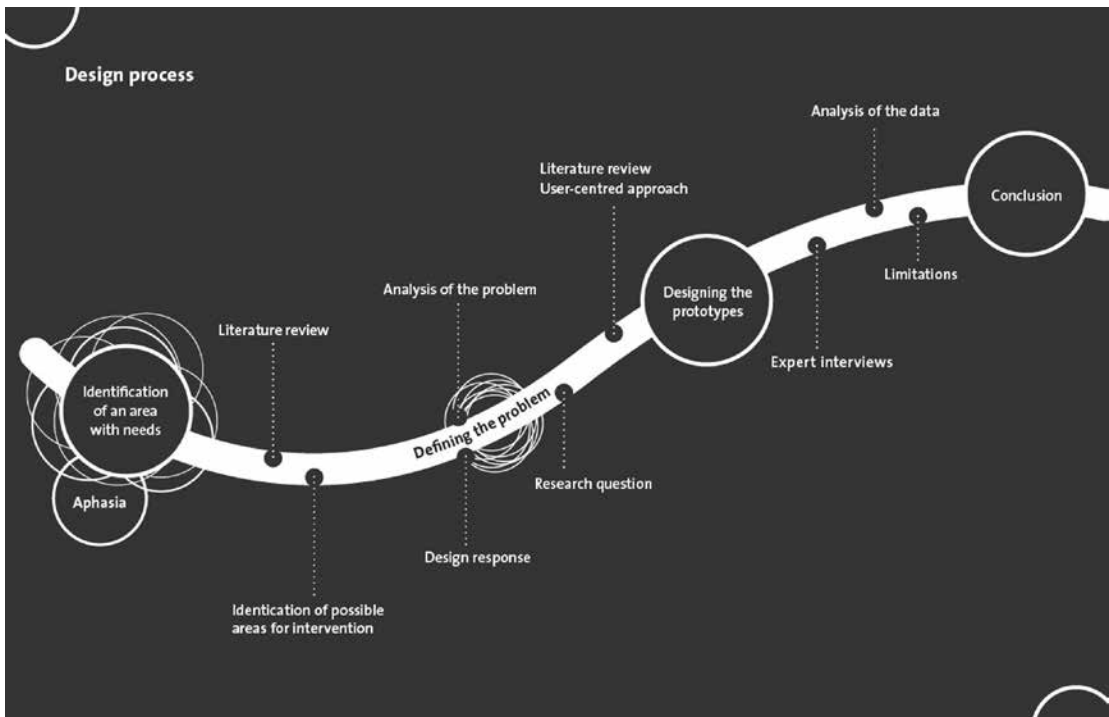
Figure 3 Design process

strategy, the approach and the methods applied.

In conclusion, it seems that there is a possibility for constructive dialogue between design and aphasia experts for the development of materials in different areas of the problem, such as: a) diagnosis, b) rehabilitation and c) general interaction between the sufferers and their environment ('at home').

In an area of highly specialized neurological problems, knowledge in visual communication design can help the development of materials and tools for people who suffer from aphasia.

There might be, of course, other ways to address the problem. Probably the process proposed could be used to develop other tools also in relation to other populations.

This project presented a process to develop guidelines for the design of games, a specific kind of game, aimed at increasing opportunities for a person with Broca's aphasia to interact with the family and with language (*figure 3*).

Applying the concepts learned, two other games were designed for the intended user. The three games designed – the board game *Questions & Answers*, the pairing domino game and the matching card game – were played with the intended user in a family situation and provided joy and interaction. The three games increased AM's opportunities to interact with the family and with language, through exposure to written and spoken words.

The prototype was redesigned following the advice of the experts and the intended user. More cards and a new level of difficulty were developed. The new prototype was used by the team of special educators and patients with aphasia, at the school of the Centennial Centre for Mental Health and Brain Injury in Ponoka, Alberta, Canada. They provided very valuable feedback.

To close, I would recommend that children's materials must not be used for

adults with aphasia. The negative feelings experienced by the users far outweigh the advantages they could offer.

A supportive environment is absolutely necessary: a family or a group of friends willing to interact with the intended user. Simply buying or having the game will not suffice. The family context is an essential dimension, given that it constitutes the main aim of the game: to increase opportunities for family interaction.

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AUTHOR NOTE

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OTTO NEURATH'S ISOTYPE AND THE RHETORIC OF NEUTRALITY

JAE YOUNG LEE

ABSTRACT   Based on the modernist belief in universal, objective and neutral communication, Otto Neurath's Isotype sought to provide a pictorial language system that transcends linguistic and cultural barriers. This essay attempts to do a rhetorical analysis of Isotype, while recognizing that the underlying modernist principles are an unattainable dream. Employing Robin Kinross' notion of "rhetoric of neutrality" as a central theoretical concept, this essay gathers relevant theoretical concepts from rhetorical studies and linguistics, applying them into the analysis. The essay analyzes Isotype in two phases. First, it addresses the rhetorical aspects embedded in Isotype such as stylistic choices, value systems, political or cultural assumptions and visual arguments. Second, it examines how Neurath actively employs the rhetoric of neutrality with simplified form, limited colors, typeface and a generic quality and clustering of pictorial symbols to enhance objective and neutral properties of Isotype.

In the history of graphic design, there have been attempts to create a pictorial language system that solves the problem of 'babelization' in verbal language. Isotype, which stands for International System of Typographic Picture Education, is a representative example of those attempts. It is a system of pictorial symbols designed by the Viennese philosopher and social scientist Otto Neurath for the purpose of communicating social and economic information to a general public. It has been applied in books, posters, museums and educational materials. Neurath's emphasis on the power of vision, and his belief that the system of pictorial language can provide a universal medium of communication that transcends the limits of language, encouraged him to develop Isotype.

Isotype is a realization of Neurath's philosophical background, logical positivism. As a member of the Vienna Circle, Neurath shares a common philosophical belief with a group of philosophers such as Moritz Schlick, Rudolf Carnap, Herbert Feigl, Hans Hahn, Viktor Kraft and Friedrich Waismann, who contributed to founding logical positivism in the 1920s and 1930s. "Logical positivism brought together two philosophical attitudes that had previously been contradictory: rationalism, which studies reality through logic, geometry and mathematics, rather than observation; and empiricism (or positivism), which claims that the only access to knowledge is through direct human observation."[1] Neurath integrates rationalism and empiricism by codifying empirical experiences to symbolic logic with recourse to a pictorial symbol system called Isotype.

Neurath holds the conviction that a universal pictorial language system is something attainable and will enhance the efficiency of communication. In terms of the historical context of graphic design, his conviction is grounded in the modernist faith in universality, objectivity and neutrality in communication. Under the influence of Modernism, graphic design views communication as an objective process that involves "the scientifically predictable transmission of meaning."[2] For objective communication, designers seek a universal vocabulary of visual forms based on clarity, unity and rationality. To create a universal visual form, the modern graphic designer eliminates all the nonessential elements such as historical associations, personal expression, styles and decoration to purify the design only through the most basic elements. Elimination of all the expressive components renders modern graphic design neutral.

However, both Neurath's conviction and the modernist ideals that provide a philosophical ground for it have been questioned by subsequent generations of designers and writers. For example, Ellen Lupton criticizes and challenges the modernist belief in universality, neutrality and objectivity in communication that underlies Isotype by distinguishing the key notion in her discussion, interpretation, from perception.[3] She states that "in the spirit of interpretation, meaning is not an innate quality of forms or automatic reaction of the brain; it is discovered by relating signs to one's own personal and cultural experience, and to other signs."[4] Hence, the notion of "interpretation" allows us to conceive signs not as something "absolute, neutral, and fixed," but as something "in historical flux."[5]

While Lupton's discussion centers on the analysis of Isotype, Robin Kinross[6] broadens the range of the discussion into the realm of information design. He discusses the rhetorical aspects in British and Dutch train timetables as an example of information design in general, and demonstrates that the belief of modern design in neutrality is not tenable. He argues that nothing is free of rhetoric since "visual manifestations emerge from particular historical circumstances," and therefore, "ideological vacuums do not exist."[7] Borrowing the term, 'interlarding,' from Gui Bonsiepe, Kinross indicates how information is "interlarded with rhetoric to a greater or lesser degree."[8] "Pure information exists for the designer only in arid abstraction. As soon as he begins to give it concrete shape, to bring it within the range of experience, the process of rhetorical infiltration begins."[9]

An important point that should be noted in Kinross' discussion is that he uses the

1—Lupton, Ellen. 1989. Reading Isotype. In *Design Discourse: History / Theory / Criticism*. Chicago, IL: University of Chicago Press, p. 146.

2—McCoy, Katherine and Michael McCoy. 1990. The New Discourse. In *Cranbrook Design: The New Discourse*. New York, NY: Rizzoli.

3—Lupton, Reading Isotype, p. 146.

4—Lupton, Reading Isotype, p. 148-149.

5—Lupton, Reading Isotype, p. 149.

6—Kinross, Robin. 1984. The Rhetoric of Neutrality. In *Design Discourse: History / Theory / Criticism*. Chicago, IL:University of Chicago Press, p. 138.

7—Kinross, The Rhetoric of Neutrality, p. 143.

8—Kinross, The Rhetoric of Neutrality, p. 131.

9—Bonsiepe, Gui. 1999. Visual/Verbal Rhetoric. In *Looking Closer 3: Classic Writings on Graphic Design*. New York, NY: Allworth Press, p. 170.

phrase, "rhetoric of neutrality," not only as the title for his essay but also as the central notion in his argument. Concluding the essay, he states that so "one arrives again at the rhetoric of neutrality. If nothing can be free of rhetoric, what can be done to *seem* free of rhetoric? The style (for such it was) of the HfG Ulm[10] was one response."[11] By this, he means that the style of the HfG Ulm, one of the representative centers of modern design, embodies what seemingly looks free of rhetoric, in other words, the rhetoric of neutrality.

Through the convergence of the discussions by Bonsiepe, Lupton and Kinross, it has been fully noted that not only Isotype or information design but the entire area of graphic design is always infiltrated by rhetoric, making the goal of modern design—universal, objective and neutral communication—something that cannot be accomplished. While Lupton focuses on bringing some rhetorical aspects in Isotype to our attention, Kinross uncovers the rhetoric of neutrality behind the mask of universality in information design and ultimately modern design.

The door has just opened. The link between rhetorical theories and graphic design has been established. It is time for more in-depth discussion of not only what rhetorical theories are relevant and can be added to the notion of the rhetoric of neutrality, but also how rhetorical theories can expand the notion. Therefore, the purpose of this essay is to identify those relevant rhetorical theories and build on the notion of the rhetoric of neutrality. The scope of this essay is limited to Isotype since, as a forerunner of information design and culmination of modern design, it is a well-established representation of the neutral rhetoric of modern design. To begin with, this essay discusses rhetorical concepts such as: *transparency* and *opacity*; Richard Lanham's distinction between *looking through* and *looking at*; Michael Reddy's *conduit metaphor*; and Roland Barthes' *naturalization* and *myth* in conjunction with the notion of the rhetoric of neutrality. Then, the essay examines the elements of Isotype that construct the rhetoric of neutrality. This essay aims to initiate a channel between the disciplines of graphic design and rhetoric through which they can communicate with each other.

10—HfG Ulm stands for the Hochschule für Gestaltung Ulm, a design institution set up in the early 1950s to continue the Bauhaus tradition.

11—Kinross, The Rhetoric of Neutrality, p. 143.

THEORETICAL CONCEPTS

To build a robust notion of the rhetoric of neutrality, examination of relevant theoretical concepts is important. The relevant rhetorical concepts are transparency, opacity, the distinction between looking through and looking at, conduit metaphor, naturalization and myth. Other than the concept of conduit metaphor, which is taken from linguistics, the concepts are from rhetorical studies or at least closely related to it. Conduit metaphor is used with other concepts in this essay since it is also useful in fleshing out the notion of the rhetoric of neutrality. By including the linguistic concept, this essay not only broadens but also deepens the discussion of the central premise of this essay. The concepts are discussed one by one and then integrated.

Transparency/opacity and looking through/looking at

Rhetorician James Jasinski discusses that the concept of *transparency* comes from critics' persistent tendency to "*look through* the text rather than fix their analytic gaze on it."[12] In other words, our habitual inclination to look through the text, overlooking the surface of the text to be looked at, makes the text itself transparent, and therefore, invisible to us. Although Jasinski's definition of the term deals mainly with verbal texts, transparency is a widely applicable notion that goes beyond the realm of writing. He confirms this applicability, emphasizing that "the idea of the transparent text is not unique to the field of rhetorical studies; it has deep roots in American thinking about political discourse and rhetorical style."[13]

12—Jasinski, James. 2001. *Sourcebook on Rhetoric: Key Concepts in Contemporary Rhetorical Studies*. Thousand Oaks, CA: Sage Publications, p. 591.

13—Jasinski, *Sourcebook*, p. 591.

14—Lee, Donald S. 1982. Transparency of the Symbol. *Philosophy and Rhetoric*, 15.2, p. 126.

15—Lee, Transparency of the Symbol, p. 126.

16—Aristotle. 1984. *Rhetoric*. New York, NY: Modern Library, p. 1404b.

17—Lanham, Richard. 2003. *Analyzing Prose*. New York, NY: Continuum, p.189.

18—Lanham, *Analyzing Prose*, p. 191, 206.

19—Lanham, *Analyzing Prose*, p. 205.

20—Lanham, *Analyzing Prose*, p. 192-193, 208.

21—Lanham, *Analyzing Prose*, p. 191.

22—Lanham, Analyzing Prose, p. 193.

23—Lanham, Analyzing Prose, p. 193 (for a figure that illustrates this spectrum, see this page).

24—Lanham, Analyzing Prose, p. 209 (for a figure that illustrates this matrix, see this page).

Donald S. Lee, a professor of philosophy, also discusses the notion of transparency, broadening the range of application to symbols in general. Pointing out the transparent quality of symbols, he also posits "transparency is a matter of seeing 'through' the symbol to something else."[14] He then regards transparency as a medium that exists between the seer and the seen object, separating them from each other. At a glance, his comparison of the transparency to the medium seems contradictory to the very notion of transparency itself. Nevertheless, the comparison makes sense since text and symbols mediate between the reader and meaning of the text, or between the seer and the seen object. This becomes more obvious with the notion of *opacity* which is the opposite of transparency. Lee continues, that as "*purely* transparent its physical presence has no important effect on that which is seen. If the medium creates an effect by distortion or opacity, then to that extent it falls short of transparency."[15] In short, transparency and opacity are the inverse of each other.

Lee's discussion of transparency and opacity is further developed by rhetorician Richard Lanham who discusses them in conjunction with the notion of *looking through* and *looking at*, and the issue of style. He prefaces his own discussion with Aristotle's notion of clarity. Aristotle claims that style "to be good must be clear, as is proved by the fact that speech which fails to convey a plain meaning will fail to do just what speech has to do."[16] Lanham indicates that the "long-standing argument for styles that don't show, that are not noticed"[17] originates from Aristotle's concept of clarity. On the basis of clarity, the ideal role of style is to convey a meaning or content naturally, minimizing verbal distortion. Emphasizing the concept of clarity, according to Lanham, Aristotle advocates the transparent and neutral theory of language.[18] For Aristotle, the language should be transparent or invisible, and subsequently make the contents as clear as possible. Consequently, clarity is synonymous with transparency. As Lanham indicates, Aristotle reduces the issue of style to "a simplistic on-off switch"[19] of, at and through, and his stylistic point of view produces and disseminates a dichotomized set of concepts—at/through, style/content, medium/message—that dominate our way of thinking.[20] Lanham also points out that Aristotle even raises the set of concepts to the ethical dimension by equating unnoticeable style and noticeable style with virtue and vice.[21] Lanham adopts the notion of looking through and looking at which is an age-old distinction made by many other theorists, including Aristotle, but he rejects the Aristotelian dualistic approach to the concepts.

Lanham questions Aristotle's moralized dichotomy of transparency/opacity and looking through/looking at with nothing in between. He argues that the "harsh simplicity of the At/Through choice reveals a fundamental truth about how we read. Yet it is not the whole truth. Our response to a verbal surface varies in self-consciousness by degree, too; it does not simply click on or off."[22] He resolves the problem of Aristotle's simplified model with "a spectrum of self-consciousness for verbal styles which measures the whole range from transparent to opaque."[23]

Based on the self-consciousness spectrum, Lanham suggests a more complex matrix. The matrix is composed of two spectrums of 'text' and 'perceiver.'[24] First, on the spectrum of text, he discusses how the original self-consciousness spectrum works in terms of literary genres such as prose and poetry. On this spectrum, prose, which encourages readers to look through the text, corresponds with transparency, while poetry, which encourages readers to look at the text, corresponds with opacity. Second, on the spectrum of perceiver, he illustrates how the original spectrum works in terms of who perceives the text. Usually, common readers tend to look through text to focus on meanings in the text, while critics tend to look at the text itself to critique it. In other words, common readers correspond with transparency while critics correspond with opacity. The two spectrums parallel each other.

Lanham states that the "matrix provides a framework for plotting both of these form/content definitions and reconciling them. At the transparent side of the matrix,

form and content are totally discrete."[25] Literary genres such as prose are good examples of this end of the continuum. "At the opaque extreme, form and content are one. Since the perceiver is looking At the verbal surface and not Through it, that surface is the content."[26] Poetry is a good example of the opaque end of the continuum since the formal surface level plays a critical role in poetry. Lanham argues that on the text spectrum, "an opaque style *is* the subject, the thing imitated and gazed at, the referent reality. Language has become its own subject, maximized its self-conscious self-reference."[27] On the perceiver spectrum, we can choose to look at a style, thus becoming literary critics rather than common readers, and vice versa.[28]

Style/substance

As evident so far, the discussion of transparency and opacity and looking through and at ultimately brings us to a more fundamental issue of style and substance. In relation to the two pairs of the concepts discussed earlier, graphic designer Andrew Blauvelt indicates that the dualistic position is embedded in the pair of style and substance as well, suggesting that debates "about style usually invoke dualisms such as form/content and style/substance."[29] As Lanham disagrees with Aristotle's dichotomous approach, Blauvelt also criticizes the dualism between style and substance. He further argues that these "artificial dichotomies divorce the terms from one another, giving the mistaken impression that there is form independent of content, or style in lieu of substance. In fact, since each term is married to the other, a relationship must be established and the terms negotiated."[30] In other words, Blauvelt emphasizes this inseparability of form and content, or style and substance by claiming that "form is legitimized on the basis of content—form is truthful or aesthetically valid when it faithfully represents content."[31]

Blauvelt further explains that "the distrust of style as false, shallow and meaningless"[32] goes back to modern functionalism. This modernist notion of "style that diverts us from the truth with its seductive surface" has indoctrinated us. Arguing that the modernist "notion of deceptive forms (style) on the surface and essential contents (substance) at the core is outmoded for contemporary graphic design,"[33] he asserts that the dichotomy based on Modernism needs to be reconsidered and our prejudice about the concept of style, form and content needs to be reconfigured. Refusing the outdated notion of style in Modernism, he argues that style is "not governed by functionalism's desire to reflect an internal truth. Style engages us on the surface—it is about appearance—but this surface is neither the glossy reflection of adoring consumers seduced by their own image nor a layer of camouflage hiding the truth. Rather, style is an outward sign of difference that gains its uniqueness in relation to other styles."[34] Hence, his definition of style as "a code of communication, not for the transparent reflection of content but as a signifier of taste"[35] rehabilitates the long-ignored importance of style by breaking down the dichotomy between style and substance.

Conduit metaphor

The *conduit metaphor*, coined by linguist Michael J. Reddy, has influence upon information studies in "modeling what we believe the terms, 'information,' 'communication' and even 'language,' mean and signify."[36] Reddy explains how the conduit metaphor works in everyday language by giving some examples as follows: "Try to *get* your thoughts *across* better," "None of Mary's *feelings came through to me* with any clarity," "You still haven't *given me* any *idea* of what you mean." He argues that "none of these expressions is to be taken completely at face value" since "no one receives anyone else's thoughts directly in their minds when they are using language" and "Mary's feelings can be perceived directly only by Mary but they do not really "come through to us" when she talks."[37] However, this is the way English speakers speak the language. As Reddy states, these examples illustrate a particular viewpoint about language that "humans place their internal thoughts and feelings within the external

25—Lanham, Analyzing Prose, p. 217.

26—Lanham, Analyzing Prose, p. 217.

27—Lanham, Analyzing Prose, p. 217.

28—Lanham, Analyzing Prose, p. 209.

29—Blauvelt, Andrew. 1995. Under the Surface of Style. Eye, 5.18, p. 64.

30—Blauvelt, Under the Surface of Style, p. 64.

31—Blauvelt, Under the Surface of Style, p. 64.

32—Blauvelt, Under the Surface of Style, p. 64.

33—Blauvelt, Under the Surface of Style, p. 64.

34—Blauvelt, Under the Surface of Style, p. 66.

35—Blauvelt, Under the Surface of Style, p. 68.

36—Day, Ronald E. 2000. The "Conduit Metaphor" and The Nature and Politics of Information Studies. *Journal of the American Society for Information Science*, 51.9, p. 806.

37—Reddy, Michael J. 1979. The Conduit Metaphor—A Case of Frame Conflict in Our Language about Language. In Ortony, Andrew, editor. *Metaphor and Thought*. Cambridge, UK: Cambridge University Press, p. 286-287.

38—Reddy, The Conduit Metaphor, p. 288.

signals of the language."[38]

Reddy defines the conduit metaphor by describing "four categories that constitute the major framework" of the notion. First, "language functions like a conduit, transferring thoughts bodily from one person to another." Second, "in writing and speaking, people insert their thoughts or feelings in the words." Third, "words accomplish the transfer by containing the thoughts or feelings and conveying them to others." Fourth, "in listening or reading, people extract the thoughts and feelings once again from the words."[39] Basically, the conduit metaphor assumes that words have insides and outsides. Therefore, thoughts, meanings and ideas can be inserted to the words, transferred to other people, and then other people can extract the thoughts from the words.

39—Reddy, The Conduit Metaphor, p. 290.

Reddy contrasts the "conduit metaphor model of communication" with the "toolmaker's paradigm" based on radical subjectivity. According to the toolmaker's paradigm, there is no such thing as a transparent conduit in communication. Such an ideal communication through the conduit metaphor model is not possible since the internal thoughts, feelings and perceptions cannot be sent to anyone by any means that we know of.[40] Although both frameworks describe a model of human communication, they take totally different positions. While the conduit metaphor model assumes that a receiver can make an exact duplication of a sender's message in his or her mind through language as a conduit, the radical subjectivist paradigm denies the existence of that kind of communication.

40—Reddy, The Conduit Metaphor, p. 293.

Reddy argues that the conduit metaphor model of communication "objectifies meaning in a misleading and dehumanizing fashion."[41] He continues to argue that it "influences us to talk and think about thoughts as if they had the same kind of external, intersubjective reality as lamps and tables."[42] Another problem of the conduit metaphor is that the "function of the reader or listener is trivialized" because he or she becomes a passive message receiver based on the assumption of the model. On the other hand, the radical subjectivist paradigm assumes that readers and listeners are active participants who reconstruct the meaning of the message. Comparing the two conflicting models, Reddy emphasizes that we have neglected the "crucial human ability to reconstruct thought patterns on the basis of signals and this ability founders,"[43] adhering to the mechanistic view of language and communication inherent in the conduit metaphor.

41—Reddy, The Conduit Metaphor, p. 308.

42—Reddy, The Conduit Metaphor, p. 308.

43—Reddy, The Conduit Metaphor, p. 310.

Naturalization and myth

Roland Barthes, a French literary critic and semiotician, also indirectly discusses the issue of transparency and the rhetoric of neutrality through his concept of *naturalization* and *myth*. Before talking about naturalization and myth, he mentions two levels of meaning in images. He argues that photographic images develop a supplementary message in addition to the analogical content itself, which is what is commonly called the style of the reproduction; a second meaning that consists of a certain 'treatment' of the image (result of the action of the creator) as its signifier and a certain 'culture' of the society—whether aesthetic or ideological—that receives the message as its signified.[44] In other words, photographic images comprise two messages: "a denoted message, which is the analogon itself, and a connoted message, which is the manner in which the society to a certain extent communicates what it thinks of it."[45] He claims that this duality of messages is "evident in all reproductions other than photographic ones: there is no drawing, no matter how exact, whose very exactitude is not turned into a style (the style of 'verism'); no filmed scene whose objectivity is not finally read as the very sign of objectivity."[46]

44—Barthes, Roland. 1977. *Image-Music-Text*. New York, NY: Hill and Wang, p. 17.

45—Barthes, *Image-Music-Text*, p. 17.

46—Barthes, *Image-Music-Text*, p. 17.

Barthes regards this duality in images as the "photographic paradox" which comes from the "co-existence of two messages, the one without a code (the photographic analogue), the other with a code (the 'art,' or the treatment, or the 'writing,' or the rhetoric, of the photograph)."[47] He uses the term, 'paradox,' because the connoted (or

47—Barthes, *Image-Music-Text*, p. 19.

coded) message develops on the basis of a message without a code. Accordingly, the connoted message can be 'innocented' through the photograph's denotation so that the connotation can assume so completely the 'objective' mask of denotation.[48] This is how the typical process of 'naturalization of the cultural' occurs.[49] Through the naturalizing process, "the denoted image naturalizes the symbolic message, innocents the semantic artifice of connotation."[50]

Another central concept of Barthes, myth, is discussed in a close relationship with naturalization. He indicates that the "purely 'denotative' status of the photograph, the perfection and plenitude of its analogy, in short its 'objectivity,' has every chance of being mythical."[51] In other words, through a naturalizing process, "denotative signs can be manipulated to hide connotative meanings by obscuring their historical origin and making them seem natural."[52] The continuous naturalizing process creates myth, and "myth has the task of giving an historical intention a natural justification, and making contingency appear eternal."[53] "Society constantly uses the first system of human language to produce systems of secondary meanings, and the resultant accumulation of connoted signifiers solidifies into ideology."[54] Therefore, I can infer that the previous discussion of transparency and looking through overlaps with Barthes' discussion of naturalization and myth in the sense that transparency and looking through are byproducts of naturalization and myth. In other words, an image becomes transparent and, subsequently, we look through the image when the image is naturalized, and the transparent nature of the image and the practice of looking through are maximized when the continuous naturalization solidifies into a myth.

Integration of the theoretical concepts

So far, I have discussed several theoretical concepts that have a close relationship with the notion of the rhetoric of neutrality. Although there are slight differences, transparency, looking through, conduit metaphor, naturalization and myth are grounded in similar ideas, while opacity, looking at and radical subjectivist paradigm also share some similarities. The first group of concepts addresses our constant effort to shift something cultural to natural; the second group shows the counteraction to the effort. The two clusters of concepts create a conflict between concealment and revelation.

As discussed so far, the two groups of concepts have been considered in a dichotomized or dualistic way, and additionally, value judgments have been made about them. Looking back, we can see that our dominant way of thinking based on the Platonian-Aristotelian system and Modernism requires us to choose one over the other; transparency over opacity, looking through over looking at, substance over style and conduit metaphor over radical subjectivist paradigm. The reason we strive to accomplish transparency in language by encouraging people to look through the verbal surface, and why we emphasize substance, thereby resisting self-consciousness about style, is because the cultural heritage of the Platonian-Aristotelian system of thinking urges us to protect its specific conception of the self and of the world's reality.[55] As a rejection to this, Reddy criticizes the mechanistic quality of the conduit metaphor, which is unable to explain a human agency that plays a critical role in communication. In addition, Lanham's modification of Aristotle's simplified either/or shift between through and at to a full spectrum with degrees of self-consciousness is also the same kind of gesture against the Platonian-Aristotelian system embedded within us.

To summarize, the notion of the rhetoric of neutrality shares a common ground with transparency, looking through, conduit metaphor, naturalization and myth, and can provide a critical framework when integrated. We are aware that a kind of paradox resides among these concepts. The naturalizing process never reaches an end, but only reveals that things cannot be fully naturalized, and therefore, they are not transparent in the end. The unattainable dream of transparency and looking through is unveiled by the constant operation of their counterparts such as opacity and looking at caused by

48—Barthes, *Image-Music-Text*, p. 21.

49—Barthes, *Image-Music-Text*, p. 26.

50—Barthes, *Image-Music-Text*, p. 45.

51—Barthes, *Image-Music-Text*, p. 19.

52—Macey, David. 2001. *Dictionary of Critical Theory*. London, UK: Penguin Book, p. 92.

53—Barthes, Roland. 1957. *Mythologies*. New York, NY: Hill and Wang, p. 142.

54—Macey, *Dictionary of Critical Theory*, p. 91.

55—Lanham, *Analyzing Prose*, p. 205.

rhetorical infiltration. By integrating these ideas into one unifying concept, the rhetoric of neutrality can provide a solid theoretical tool for us breaking down the myth of Isotype and modern design. Especially, the paradoxical quality captured by the relevant concepts is the essential aspect that lies at the heart of the rhetoric of neutrality.

In a sense, the paradoxical quality is inherent in the rhetoric of neutrality itself. The rhetoric of neutrality can be defined as a rhetorical strategy that a rhetor employs to make something look objective and neutral. However, as the juxtaposition of the two incompatible words implies, the strategy is doomed to fail. Rhetoric and neutrality cannot coexist. Hence, the rhetor cannot achieve neutrality since the rhetoric of neutrality is just a kind of rhetoric in which the rhetor's striving for neutrality ends up by revealing the impossibility of the dream. Therefore, the belief of objectivity and neutrality that resides in Isotype and modern design can be refuted by the very paradoxical nature of the rhetoric of neutrality, which is a defining premise of Modernism. This is why the rhetoric of neutrality can become a tool to break down the myth of modern design.

ANALYSIS OF ISOTYPE

Keeping the previous discussion of the theoretical concepts that revolve around the rhetoric of neutrality, I now analyze Isotype from a rhetorical perspective. It should be noted that I assume that Neurath's Isotype does not stop at having some rhetorical aspects, but actively employs the rhetoric of neutrality. Neurath employs the rhetoric of neutrality in the modernist belief that neutral communication can be realized through it. Whereas Lupton focuses on discussing some rhetorical aspects in Isotype, the aim of this essay is to reveal the more fundamental rhetorical dimensions artfully hidden in Isotype. The notion of the rhetoric of neutrality, adopted from Kinross, is now used to discuss Isotype's hidden rhetorical dimensions.

The historical context in which Isotype is situated offers a setting for the analysis. As the first step of the analysis, I attempt to undermine Neurath's belief that Isotype is a neutral and transparent representation of reality, free of rhetoric, by exploring its rhetorical aspects in detail. Next, to see whether the rhetoric of neutrality is embodied in Isotype, I examine what design techniques are adopted, then, I integrate the analysis with the previously discussed theoretical concepts.

Rhetorical aspects of Isotype

Through Isotype, Neurath seeks to create a neutral and objective pictorial symbol system. Such intent implies that Isotype can be free of rhetorical infiltration, and therefore, does not involve stylistic choices. However, some of his Isotype charts present a particular style that reflects a particular time period. For example, the Isotype symbol for cars (*figure 1*) reflects a particular car style in the 1920s and 1930s. It is neither a neutral nor a universal symbol of a car that transcends a particular time period because it instantly reminds us of the particular historical period, referring to the style and taste of that era. It might function as a somewhat objective symbol for people in that specific time period, but not to us today as surrounded by all different kinds of car styles. The telephone symbol (*figure 2*) also shows a particular style of telephone used in 1920s and 1930s.

The apparent style that exists in the Isotype symbols reveals that Isotype is an outcome of the particular time and situation in which Neurath was situated, rather than an objective representation of reality. The atmosphere of the particular era and culture casts an inevitable shadow on Isotype through stylistic choices. In a sense, this is where Barthes' notion of a connoted message applies. As a connotative meaning triggered by

the treatment of an image always lurks under a denotative meaning and allows rhetorical infiltration, particular styles of various objects lurk under the Isotype symbols and reveal a rhetorical dimension.
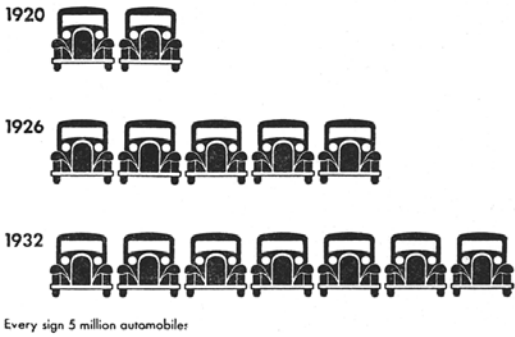
Automobiles of the Earth

Figure 1 "Automobiles of the Earth" © University of Reading
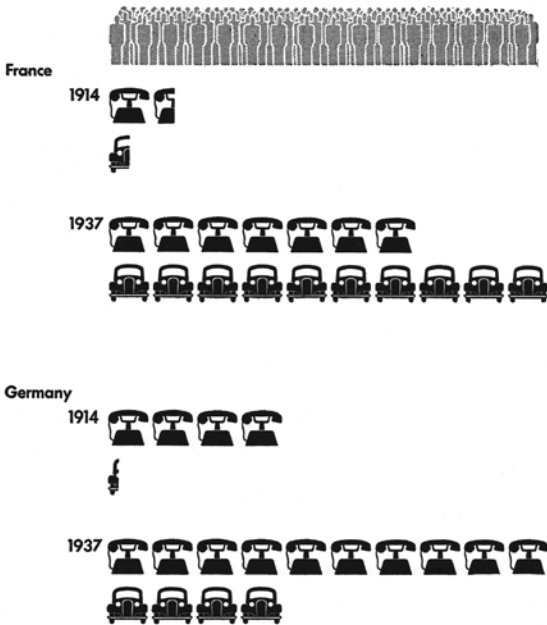
Telephones and Automobiles per 200 Population

Figure 2 "Telephones and Automobiles per 200 Population" © University of Reading
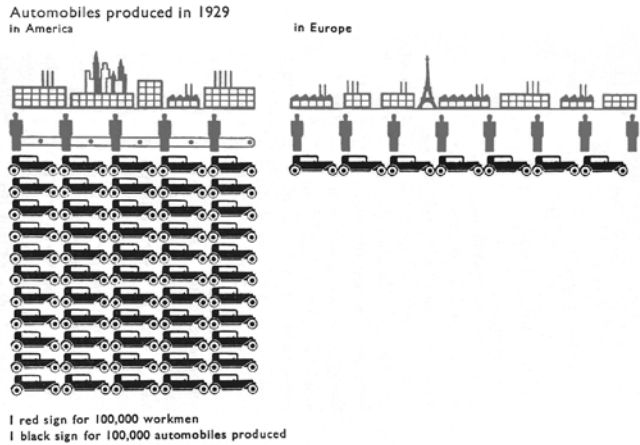
Figure 3 "Automobiles Produced in 1929" © University of Reading

The car symbol (*figure 3*) also reflects a specific car style in the 1920s and 1930s. What should be noted here is that the car symbol is different from the one in Figure 1. While the previous one is a front view of a car, the one in Figure 3 is a side view. This weakens Neurath's belief in the objectivity of Isotype. If an object like a car is represented in different ways, depending on which viewpoint is taken, an objective representation is not possible. Each represents a particular point of view. As Lupton discusses, the inconsistency problem in Isotype also raises the same problem. For example, as shown in Figure 4, Isotype inconsistently employs different symbols for a man. As Lupton indicates, although Neurath tried to abide by the principle of consistency, Isotype could not have been consistent because "it was a huge sprawling experiment."[56] To make matters worse, it had been developed over a period of twenty-five years, and wartime "political pressures forced him to relocate several times, the result being changes in staff and loss of documents."[57]

56—Lupton, Reading Isotype, p. 154.

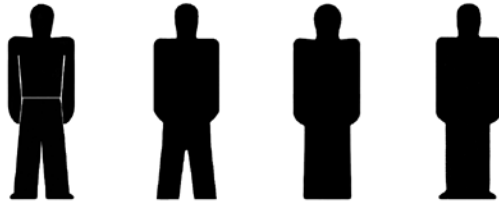57—Lupton, Reading Isotype, p. 153-154.

Figure 4 Inconsistency in Isotype pictorial symbols © University of Reading

In addition to the stylistic choices, some Isotype charts exhibit a particular value system with political and cultural assumptions. The Isotype chart (*figure 5*) defines marriage as a union of a man and woman, refusing to include the same-sex marriage within its boundary. Our conception of marriage is reinforced by the Isotype chart that embeds a particular value system in its form. The issue of race is also marginalized in

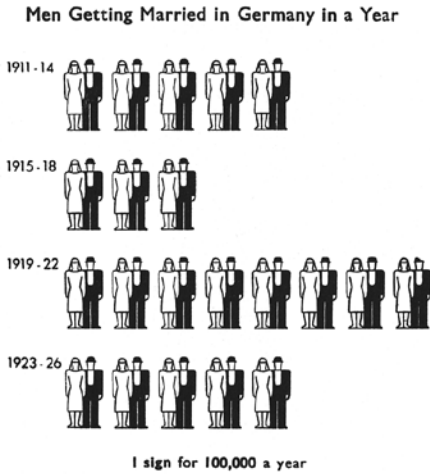this chart since it assumes that all German men and women are white.

Men Getting Married in Germany in a Year

1911 - 14

1915 - 18

1919 - 22

1923 - 26

I sign for 100,000 a year

Figure 5 "Men Getting Married in Germany in a Year" © University of Reading

Some Isotype charts make comparisons among different countries. For comparisons, Neurath transforms a world map into an arrangement of countries called the "six great divisions of the earth" (*figure 6*). What is noticeable in these divisions is that they are not commensurate. While some belong to the political category of country, others belong to the geographical category of continent or region. This gives more weight to the individual countries than to the continents. Consequently, some parts of the earth are emphasized while others are trivialized.

Another dimension to be considered is that the two levels in the divisions of the world create a visual hierarchy, putting Canada, U.S.A., Europe and Soviet Union over the countries in the lower level. The 'Far East' maximizes the hierarchy because of its name and its relative position in the set of divisions. The Far East is to be neglected because its location, the lower right corner, is where our eyes go last. Further, the Far East is a highly ideological term that comes from the Western point-of-view. In other words, it might not be 'Far' if the 'East' is viewed as the center of the earth. So, Neurath's divisions of the earth illustrate how a particular ideology or political assumption infiltrates the map frequently used for Isotype charts. Actual Isotype charts that employ the map frame are shown in Figures 7 and 8.

CANADA, U.S.A.	EUROPE	SOVIET UNION
MIDDLE AND SOUTH AMERICA	AFRICA, SOUTH ASIA, AUSTRALIA	FAR EAST

Figure 6 Neurath's "Six Great Divisions of the Earth" © University of Reading
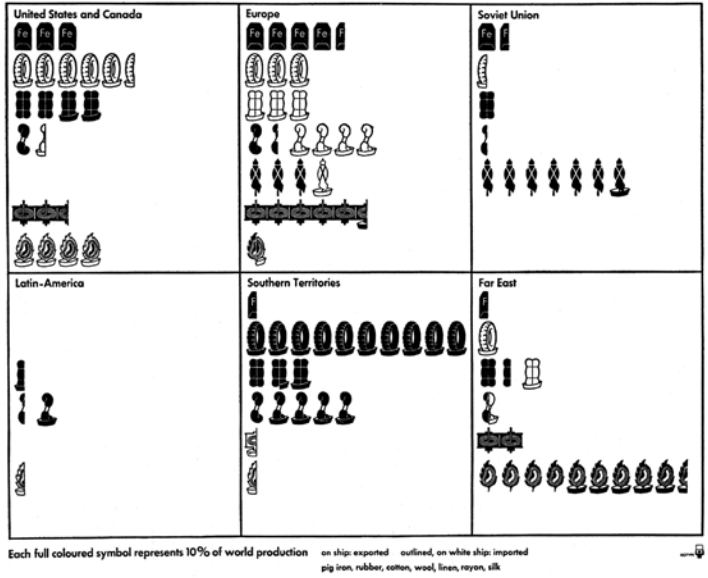
Raw Materials

Figure 7 "Raw Materials" © University of Reading
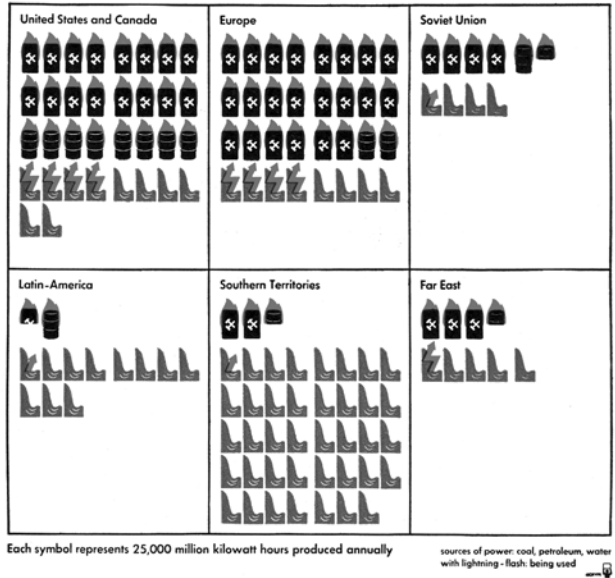
Sources of Power

Figure 8 "Sources of Power" © University of Reading

Charles Kostelnick brings up the "rules of inclusion and exclusion," indicating that designers "control what is and what is not visualized, and that control has rhetorical consequences."[58] The "rules of inclusion and exclusion" are originally discussed by Marthalee Barton, who considers maps as an ideological medium.[59] She references Marxist literary critic Raymond Williams' discussion that in the hegemonic process "certain meanings and practices are neglected and excluded…reinterpreted, diluted, or put into forms which support or at least do not contradict other elements within the effective dominant culture."[60] So, the rules of inclusion "determine whether something is mapped, what aspects of a thing are mapped, and what representational strategies and devices are used to map those aspects" to "legitimate dominant interests."[61] Rules of exclusion and repression are about what is to be excluded or repressed to serve dominant interests.[62] The rules are obviously present in Isotype since it includes or excludes certain aspects of a concept to legitimize a particular ideology of the dominant culture. As discussed so far, Isotype charts serve as a medium to show a particular value system and political or cultural assumptions of society

58—Kostelnick, Charles. 2004. Melting-Pot Ideology, Modernist Aesthetics, and the Emergence of Graphical Conventions: The Statistical Atlases of the United States, 1874-1925. In Hill, Charles A. and Marguerite Helmers, editors. *Defining Visual Rhetorics*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers, p. 231-232.

59—Barton, Marthalee. 1993. Ideology and Map: Toward a Postmodern Visual Design Practice. In Blyler, Nancy R. and Charlotte Thralls, editors. *Professional Communication: The Social Perspective*. Newbury Park, CA: Sage Publications, p. 53.

60—Barton, Ideology and Map, p. 53.

61—Barton, Ideology and Map, p. 54-55.

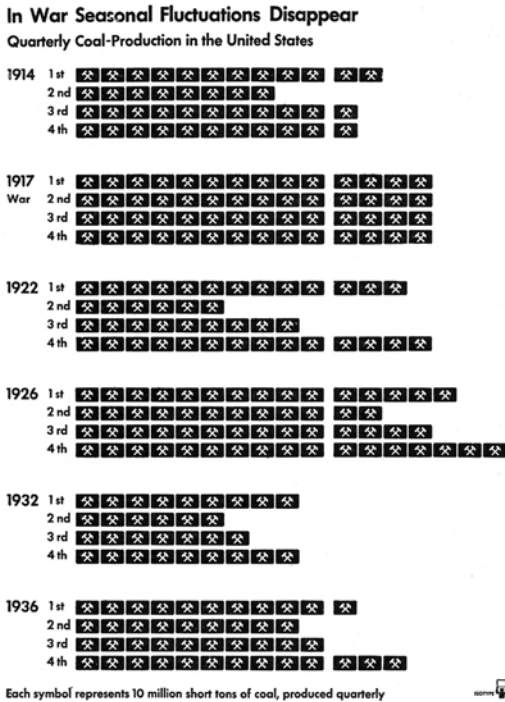62—Barton, Ideology and Map, p. 59.

Figure 9 "In War Seasonal Fluctuations Disappear" © University of Reading

Another rhetorical aspect of Isotype is that it presents some visual arguments. Although Neurath considers that Isotype conveys social and economic information, and therefore is free of argument, there are some Isotype charts that present particular viewpoints. As Robert J. Leonard argues, the Isotype chart (*figure 9*) shows how war decreased the seasonal fluctuations in coal production.[63] As the title and visual pattern suggest, the fluctuation disappears at war time, 1917. This implies that the centrally controlled situation of the war, highlighted by visual anomaly, decreased the fluctuation,

63—Leonard, Robert J. 2001. "Seeing is Believing": Otto Neurath, Graphic Art, and the Social Order. *History of Political Economy*, 31, special supplement, p. 469.

and therefore, played a positive role in solving the problem of the market system. Neurath was interested in economic issues. According to Robert N. Proctor, from "his studies of the Napoleonic and American civil wars, Neurath discovered certain inefficiencies in economies governed by free and unregulated markets."[64] As a result, he becomes a supporter of economic planning and regulation as a solution to the inherent problem of the free market system.

64—Proctor, Robert N. 1991. *Value-Free Science?: Purity and Power in Modern Knowledge*. Cambridge, MA: Harvard University Press, p. 168.

As Leonard indicates, the chart (*figure 10*) illustrates how the traditional market system was maintained by destroying coffee stocks. The coffee symbol in flames visualizes the amount of coffee production that should be destroyed to maintain the market system. In this example, Neurath again illustrates the problem of the market system; that it cannot run smoothly without external involvement. Through this example, he again visually argues that planning and regulation are necessary to maintain the market system.

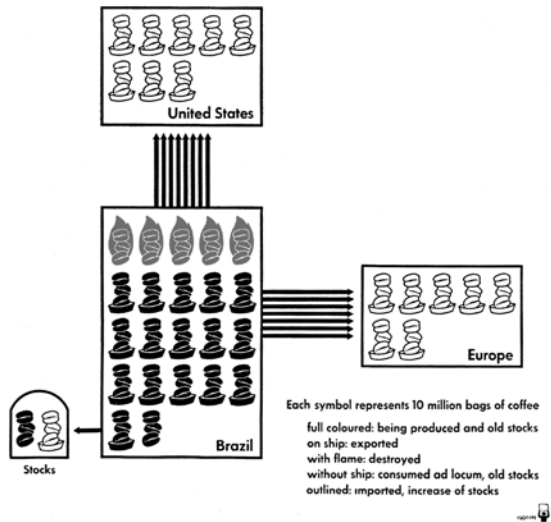Figure 10 "Market Regulation by Destruction, Brazil 1927-1937" © University of Reading

Leonard's discussion of Isotype charts (*figures 9 and 10*) focuses on demonstrating that the two charts "bore an implicit critique of the market system and were intended to promote the need for planning."[65] What I am trying to amplify in his thesis from a rhetorical perspective is that the charts are visual arguments that promote the necessity of a regulated and planned economic system. The visual arguments are additional evidence that reveals the rhetorical aspect of Isotype. Hence, Neurath's personal belief in economic and social issues is visually expressed in the Isotype charts. Indeed, the Isotype charts show that they are inseparable from Neurath's attitude or belief, shaped under the particular situation of the particular period.

65—Leonard, "Seeing is Believing," p. 469.

The rhetoric of neutrality embedded in Isotype

Neurath's belief in an objective and neutral system of visual language has been partly undermined by disclosing some rhetorical aspects of Isotype. We are now

aware that Isotype is not an international visual language system that makes bias-free communication possible. However, there is another rhetorical dimension in Isotype that should be a real focus of this essay.

This dimension goes beyond just revealing some rhetorical aspects of Isotype. As discussed earlier, it is about assuming that Isotype not only happens to have some rhetorical aspects, but deliberately employs the rhetoric of neutrality as a strategy to appear seemingly neutral in a more active sense. Based on this assumption, we can see Neurath as a rhetor. This conclusion is possible by realizing the inherent paradox in the rhetoric of neutrality and acknowledging that the modernist belief in the objectivity and neutrality of Isotype is simply a kind of ideology. The paradox and the ideological aspect of design have been recognized through history, especially through the current postmodern discourse in design. For instance, Victor Margolin's statement that all "communication is ideologically grounded, even if it is transmitted in forms that purport to be free of ideology"[66] confirms this argument.

The next step is a more systematic rhetorical analysis of Isotype in terms of the application of the rhetoric of neutrality. Before going into analysis, I briefly discuss the historical context in which Neurath designed Isotype.

Historical context

Visual language is "rhetorically charged because designers deploy it in specific situations to achieve certain ends."[67] Isotype as a visual language is not an exception to the influence of a specific context and the rhetorical charge it provides. Indeed, Isotype was created as Neurath's attempt to meet particular exigencies of the 1920s. Design historian Philip B. Meggs indicates that "Neurath felt that the social and economic changes following World War I demanded clear communication to assist public understanding of important social issues relating to housing, health, and economics."[68] Hence, the need for a comprehensive system had been raised in Central Europe by the particular context of the era, and this is one of the contexts that motivated Neurath to create Isotype.

From a narrower perspective, we can think about the postwar situation in Vienna, Austria where Neurath lived and worked. According to design historian Michael Twyman, "In Austria after the First World War there was much that needed to be done. With the collapse of the old Hapsburg Empire Vienna and Austria as a whole were in difficult straits. They were deprived of resources, there were shortages of food and housing which threatened to undermine public health, and inflation was running at an alarming rate. It is against this background that we have to see Otto Neurath's contributions to graphic design. He wanted to bring to the man in the street an awareness of the social and economic issues of the time in Vienna, and to draw attention to these by making comparisons between the present and the past and between Vienna and other cities."[69] Accordingly, strong concerns about social and economic issues have been raised from the particular context of Vienna, and this is another exigency Neurath as a rhetor had to deal with.

On top of that, logical positivism, Neurath's theoretical ground, has an influence on shaping the rhetorical context for Neurath himself. Formulated in 1920s and 1930s, logical positivism is based on the two major assumptions that direct observation is the sole means of access to knowledge and that logical analysis should be adopted to approach philosophical problems.[70] Rejecting metaphysics and theology, he argued that a true science called "unified science" was to be sought in order to create a new modern life. Thus, logical positivism also provided a ground for Neurath's own rhetoric.

Visual elements that embody the rhetoric of neutrality in Isotype

In this part of the essay, the design techniques that Neurath employs to embody the rhetoric of neutrality in Isotype are analyzed and discussed. As shown in Figure 11, the readily noticeable feature of pictorial symbols in Isotype is that they take simplified

66—Margolin, Victor. 1989. *Design Discourse: History / Theory / Criticism*. Chicago, IL: University of Chicago Press, p. 21.

67—Kostelnick, Melting-Pot Ideology, p. 226.

68—Meggs, Philip B. 1998. *A History of Graphic Design*. New York, NY: John Wiley & Sons, Inc. p. 293.

69—Twyman, Michael. 1975. *Graphic Communication through Isotype*. Reading, UK: University of Reading, p. 8.

70—Lupton, Reading Isotype, p. 146.

and reductivist form and color. In terms of form, only minimal indispensable elements are selected and employed, avoiding additional ornamentation. Neurath mentions that "the value of teaching by pictures is that facts are put before the mind in a simple, straightforward way and are kept in memory."[71] Believing the modernist phrase, "less is more," he argues that "a simple picture kept in the memory is better than any number of complex ones which have gone out of it."[72] He applies the principle of simplicity in determining the number of symbols as well, arguing that a small number of good pictures lead to greater teaching effect and clearer memory.[73]

71—Neurath, Otto. 1936. *International Picture Language: The First Rules of Isotype*. London, UK: Kegan Paul, Trench, Trubner & Co., Ltd, p. 27-28.

72—Neurath, *International Picture Language*, p. 28.

73—Neurath, *International Picture Language*, p. 66-67.

Figure 11 Isotype pictorial symbols for men, women, cogwheels, vacuum cleaners, coffins, homes, and ships
© University of Reading

Lupton also discusses the simplified quality of Isotype, demonstrating that pictorial symbols of Isotype follow the rule of 'reduction' in the sense that they find the simplest expression of an object.[74] As the central techniques that embody the rule of 'reduction,' she points out 'silhouette' and 'flatness.'[75] As shown in Figure 12, Isotype eliminates 'interior detail' using silhouette and avoids perspective making objects appear two-dimensional for the simplest expression.[76]

74—Lupton, Reading Isotype, p. 152.

75—Lupton, Reading Isotype, p. 152.
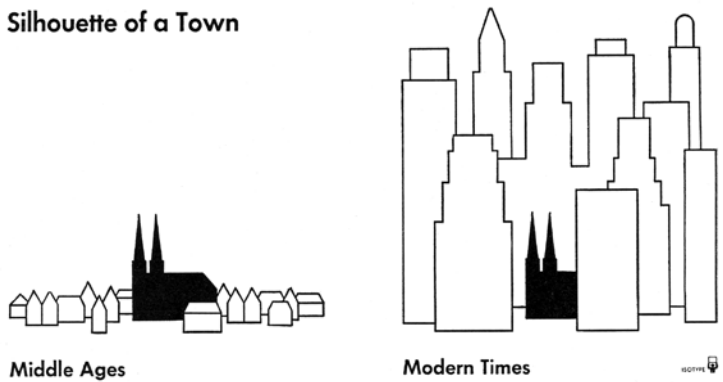
76—Lupton, Reading Isotype, p. 152.

Figure 12 "Silhouette of a Town" © University of Reading

The simplicity rule also applies to color. As Neurath indicates, there are seven major colors for use in Isotype; white, blue, green, yellow, red, brown and black. Some of them have a further division into dark and light color such as light and dark blue, or are mixed with other colors, as white and black to make grey, yellow and red to make orange etc.[77] Although other colors are often added, the main colors are black and white. Neurath states that it is better to use as small a number of colors as possible since most people do not have a delicate sense of color.[78]

77—Neurath, *International Picture Language*, p. 42.

78—Neurath, *International Picture Language*, p. 44.

Figures 13 and 14 show how various visual elements of Isotype are stripped down to simplified forms and colors. In Figure 13, the visual elements such as clothes, weapons and personal ornaments are stripped away in the second row. Hence, we can distinguish the different ethnic groups only by their skin colors. In Figure 14, the distinction between ethnic groups is only made by color difference with the exception of the hat for Asians.
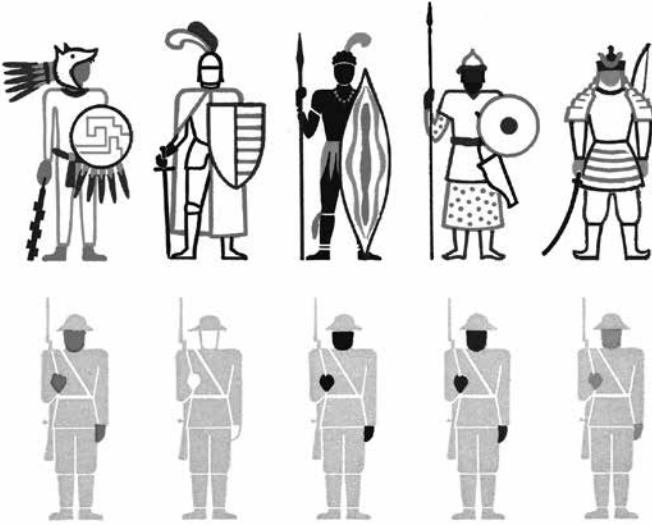

Figure 13 Simplification of Isotype © University of Reading

The typeface chosen for Isotype also adopts a simplistic model. Neurath chooses the geometric sans serif typeface, Futura, designed by Paul Renner in the 1920s. Futura has less room for expressing a particular style than serif typefaces and is consistent with the reductivist strategies of representation discussed so far. However, sans serif typefaces are not free of social and cultural implications. Lupton indicates that in the twentieth century, "sans serif typefaces have expressed the machine age. Traditional references to handicraft are stripped from the essential, geometric core of the alphabet."[79] Kinross also claims that "the choice of typeface is often telling, in that it indicates the ideas and beliefs that inform the process of design."[80] In spite of its desire for objectivity and neutrality, therefore, the choice of sans serif typefaces cannot be free of social and cultural implications. It is within the context of machine civilization and the "need to save labor, time, and money and to improve communication"[81] brought about modern machine aesthetics. Neurath chooses Futura for Isotype under such circumstance.

To sum up, the rule of simplicity controls the forms and colors of pictorial symbols and typeface choice. This approach to design helps the rhetor, Neurath, to carry out the rhetoric of neutrality in Isotype. By deliberately eliminating all detail, Neurath strives to make Isotype look like an essential and objective medium of communication. Stylistic devices are minimized and only the core elements that purport to transcend cultural differences are adopted. In translating the rhetoric of neutrality as simplicity, Neurath seeks to create a transparent, objective and neutral system of visual language.

The issue of the simplified forms can be further discussed within the framework of the generic quality of Isotype pictorial symbols. As Lupton indicates, reduction gives an

79—Lupton, The Reading Isotype, p. 153.

80—Kinross, The Rhetoric of Neutrality, p. 135.

81—Kinross, The Rhetoric of Neutrality, p. 138.

82—Lupton, Reading Isotype, p. 153.

83—Lupton, Reading Isotype, p. 153.

image a generic status by eliminating details.[82] Thanks to its reduced form, each Isotype pictorial symbol represents a class of objects, not any particular object.[83] As a result, the system constitutes a collection of homogeneous symbols, none of which is to be read in detail. The generic quality of Isotype pictorial symbols enhances their transparency. Pictorial symbols should function like a transparent medium that calls our attention to substance, rather than an opaque medium that calls attention to style. In other words, they are not to be looked at but to be looked through.
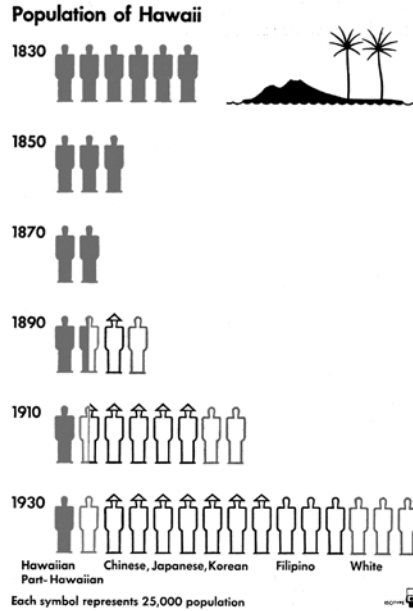

Figure 14 "Population of Hawaii" © University of Reading

Through the arrangement of Isotype charts, the transparent quality of pictorial symbols is further strengthened. In Isotype charts, pictorial symbols are arranged horizontally or vertically, forming clusters of symbols. The arrangement in Isotype charts creates a kind of conflict between attention to individual pictorial symbols and attention to clusters of pictorial symbols. Nonetheless, because a large number of identical pictorial symbols are arranged in a group, our attention moves toward the clusters of pictorial symbols after a relatively short period of attention paid to individual pictorial symbols. The clustering of pictorial symbols in an Isotype chart encourages readers to compare their relative size or amount. This process gives readers a sense that the Isotype chart displays quantitative and statistical information, and also encourages them to assume that Isotype charts present factual and innocent information. Consequently, the clustering enhances the degree of transparency, and encourages us to look through symbols. To summarize, in addition to simplified form, mimited colors and sans-serif typeface, the generic quality and the clustering of pictorial symbols also increase the transparency of Isotype and strengthens our belief that Isotype is an objective and neutral medium of communication.

Theoretical concepts and the rhetoric of neutrality in Isotype

The rule of simplicity, as a design principle applied to form, color and typeface choice in Isotype, is central to enhancing its transparent quality. By eliminating visual elements that would otherwise call attention to themselves, Neurath positions Isotype toward the transparent end in Lanham's spectrum of self-consciousness. The generic quality of Isotype pictorial symbols and our assumption that they provide quantitative and objective information, attained through the simplified form and symbol clustering, push Isotype much closer to the transparent end of the continuum.

By employing the design techniques, Neurath increases the transparency of Isotype, and encourages people to look through Isotype. His ideal for objectivity and neutrality motivates him to create a conduit named Isotype. In Barthes' terms, his striving for neutrality through Isotype is a naturalizing process of the cultural. The fundamental theme that resides in the clusters of the theoretical concepts is the age-old conflict between the utopian belief in neutrality and the rhetorical or ideological infiltration and between 'natural' and the 'cultural.' Isotype exhibits the modern movement toward the utopian belief in neutrality, and how it fails in the paradox of the rhetoric of neutrality.

CONCLUSION AND IMPLICATIONS

Analyzing the concept of Isotype rhetorically confirms that it is neither an objective nor a neutral communication system, but only pretends to be objective by employing the visual rhetoric of neutrality. The analysis also emphasizes that the paradox created by juxtaposing the two incompatible words, rhetoric and neutrality, is an essential aspect of the critical framework, as well as the very cause of the failure in the modernist ideal of universality, neutrality and objectivity. By examining several theoretical concepts that center on the rhetoric of neutrality and applying them to the rhetorical analysis of Isotype, not only is this paradox revealed but also the vocabulary to describe it is diversified.

As discussed, from a rhetorical point of view, Isotype is a highly deliberated pictorial language system that draws our attention to the seeming neutrality of the denotative level of meaning in order to hide the connotative meaning. Under the surface of the apparent neutrality, based on the simplified visual forms, Isotype hides political, social and cultural agendas. As detected through the rhetorical analysis of Isotype, there are connotative meanings such as a particular style or taste of an era, value systems, political assumptions and economic or social agendas hidden under the rhetoric of neutrality; we do not see the connotative meanings under the surface, and furthermore, we are not likely to be critical about a particular value, opinion or position that recurs at the level of connotative meaning.

Hiding through the rhetoric of neutrality has significant implications for communication in a political sense, and raises some important questions. As Neurath used the neutrality of Istoype to deliver social and political messages several decades ago, another designer might also use apparently neutral forms (such as graphs, charts or diagrams) to communicate what he or she intends or at least what is inevitably infiltrated by a certain kind of rhetoric, and therefore not neutral any more. This has significant consequences in a political world. The seemingly transparent system of visual communication might function as a manipulative tool to disguise politically charged messages as neutral, and serve to affect, change or bias people's attitude, viewpoint or opinion about an issue in a certain way.

Other than this, what are the consequences of the seeming neutrality in communication in a political world or in communication in general, and what is graphic

designers' role in it? If we broaden these issues raised by the rhetorical analysis of Neurath's Isotype, what is graphic designers' role in our discussion of rhetoric, visual form and viewers' criticality? Is there an ethical dimension in this discussion? If yes, what is it, and what does it mean to graphic designers? The analysis of Otto Neurath's Isotype and the exploration of the rhetoric of neutrality put us in an even broader frame of mind that involves designers' intent and viewers' criticality, and encourages us to ask more questions.

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ANATOMY OF AN ARABETIC TYPE DESIGN

Saad D. Abulhab

ABSTRACT   Arabetic type design, like type design in general, should not be limited by rigid rules, other than those advocating open choice and user options. But as with all design fields, highlighting certain principles and guidelines is crucial to realizing a successful project. In an Arabetic font design environment, such guidelines and principles should reveal deeper understanding of various script's visual and behavioral defining characteristics rather than mere traditional calligraphic or handwriting norms. A main goal of this study is to emphasize that designing Arabetic fonts is much easier than portrayed, and designers of all backgrounds can be more involved designing rather than deciphering complexities. Classifying Arabic as complex may add challenge and thrill to a project, but can unfairly harm a flexible and powerful script. According to their connecting behavior in the traditional model, Arabetic letters are two types: restricted or unrestricted. Based on this and other observations, the study provides a solid design model, free of the restraints of the chaotic four shapes per letter model widely used today. It does that through a systematic analysis of the Arabic script rather than its historic calligraphic flavors. A Mutamathil type style font, Mehdi, is used by this study for visual illustration. But the model provided is equally valid for the design and implementation of any other Arabetic font including multiple glyphs per letter fonts. The choice of Mehdi is neither arbitrary nor biased given that its design also implements a complementary alternative input method, NAIM.

Designing an Arabetic type requires adequate understanding and exposure to the original Arabic script visual characteristics and letterforms. Other derived scripts have added or subtracted letters and shapes but, more or less, they still share with Arabic its overall visual characteristics. One may point out that a derived script, like Kurdish, has different visual characteristics than Arabic due to different utilization of shapes. But the key point is that it is still using the same shapes. The absolute majority of derived scripts differentiate their new letters by adding various diacritic marks above or below original Arabic letter body forms, or use the same glyphs for different scriptural tasks. Except for a couple of cases (i.e. Urdu Ha u06C1) they have not added completely new body shapes unknown in the original script. Arabic is the minimum common denominator of most derived scripts and therefore it is recommended, but not required, to start an Arabetic type project with it. This essay will analyze the Arabic script in detail but will point out—when applicable—how other derived scripts relate to it.

The design model outlined here does not adhere to the doctrine of the usual four glyphs per letter model in use today, but it is fully compatible with it. This study will present the new model through analysis and visual illustrations. First, it will examine the alphabet, then it will discuss its visual defining characteristics, and finally it will provide, with the aid of typographic charts, an anatomical view of shapes and sets along with specific design recommendations. Needless to say, creating Arabetic fonts and fonts in general, require software tools and related technical expertise whose discussion goes beyond the scope of this work.

WHAT IS AN ARABIC ALPHABET?

To design a typeface for a specific script, one should be familiar with that script's definitive alphabet. Historically, letters and shapes of the Arabic alphabet were identified and grouped in several different ways based on vocal mouth source, geography, shape similarity or other criteria. The number of letters varied, some listed 29 letters while others listed only 28. Differences are primarily about whether to include soft 'Alif' (u0627), 'Lam Alif' ligature or 'Hamzah' (u0621).

In modern typography, the Unicode standards introduced yet another grouping of Arabic letters. A unique number was assigned to each member of the minimum letter shape set required to construct readable Arabic text, including soft vowel diacritic marks (or Harakat), regardless of whether a shape was a part of the common alphabet. The Unicode alphabet is based on Arabic writing not language and grammar. It encompasses 36 members, including in addition to the usual 28 - 29 common letters, four basic letters for 'Hamzah' ligature combinations, one for 'Alif Maddah' (u0622), one for 'Alif Maqsura' (u0649) and one for 'Taa Marbutah' (u0629) (Unicode Consortium, 2005). Efficient keyboarding and minimum letter shapes utilization were apparently the main factors behind the Unicode classification. In a way, this is similar to grouping both lowercase and uppercase letters in the minimum set required to generate Latin text. The Arabic Unicode alphabet is more representative, at least typographically, than the commonly used alphabet and, therefore, this study will use it instead (*see figure 1*). Notice that the 'Lam-Alif' ligature and 'Hamzah' are full members in some alphabet groups while omitted in others. Also notice that the faded glyphs are alternative final form shapes recommended for all letters classified in this study based on connectivity as unrestricted letters, as will be explained later.

Other Arabic alphabets were introduced based on typography and letters shape analysis. Well-known Iraqi type designer and calligrapher, Muhammad Sa'id al-Saggar, patented in 1972 a new type design method to construct Arabic glyphs from one or more common shape components he called 'roots.' Accordingly, he identified a set of 21

roots (*see figure 2*) that he named the Concentrated Arabic Alphabet (al-Abjadiyah al-Arabiyah al-Murakkazah), later referred to as Saggar's Alphabet (Abjaddiyat al- Saggar; al-Saggar, 1998). In 1973, a metal font based on his design was manufactured for a major Iraqi newspaper (al-Thawrah) and was used for many years to print headings. This font is probably the smallest Arabic font ever made. Adopting a similar design approach today, Dutch type designer Thomas Milo created remarkably light and sophisticated Arabic calligraphic fonts.

Typically, an alphabet serves several functions. The most important among them is facilitating language learning and writing. One can argue that the Unicode set of Arabic letters constitutes a unique Arabic Alphabet. It has even done a better job by additionally facilitating solid text searching and indexing capability. But it is difficult to call a set of shape roots an alphabet. Even as a purely technical method to reconstruct pre-drawn calligraphic shapes, this practice of chopping letters can harm Arabic typography on the long run. It would be a discouraging and difficult model for most type designers. It would require proprietary software platforms to process such random number of designated shapes. But the most damaging effect if this method is to be adapted universally would probably be loss of standardization, a crucial condition for a healthy typography environment.

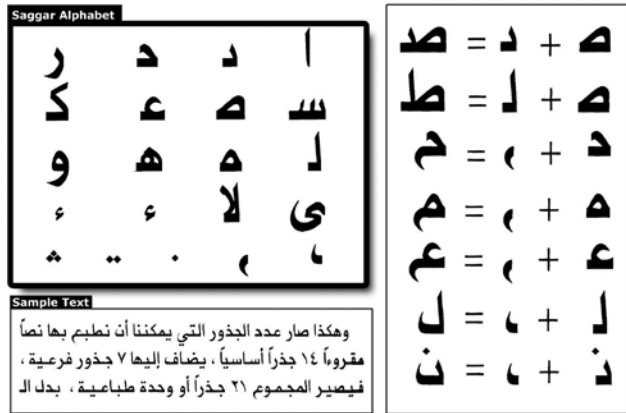Figure 1 Examples of Arabic alphabets

Figure 2 Concentrated Arabic Alphabet (Abjaddiyat al-Saggar)

ARABIC SCRIPT VISUAL CHARACTERISTICS

Traditional Arabic appears to conform to seven common characteristics: glyph connectivity, multiple shapes per letter, ligatures, variable x-height values, overall horizontality and extensive use of dots. When utilized, the required, but only occasionally used, soft vowel diacritics would constitute an additional visual characteristic. It is not absolutely mandatory to implement all of the above characteristics in every type design project. These are not rules of design or so-called script rules. An Arabic typeface design project should be as open as any other typography project. Each of these characteristics will be discussed in the following sections.

Connectivity, ligatures and multiple shapes

Establishing Arabic letters connectivity as a minimum script rule is without a doubt the most controversial topic in Arabic typography. Connectivity is not simply about connecting letters; it is about restrictions and consequential restrictions. As much as connectivity had played a major role in advancing the Arabic script historically, imposing connectivity as a required minimum typographic design rule would risk its future and survival.

Most likely, the drive for universal text connectivity in Arabic was the direct reason behind its adaptation of multiple shapes per letter, including ligatures formed by connecting two or more shapes. Historically, Arabic not only strived to connect letters within words but had also virtually connected words themselves by eliminating inter-word spacing. Consequently, alternative shapes were needed to handle both connectivity and its specific related condition: disconnection. Writing speed was possibly a major factor behind connectivity. But the creation of alternative position dependent shapes was most likely a requirement for an uninterrupted pen flow.

Being a major defining factor that influences other characteristics, connectivity is therefore important to analyze and examine further. To start, Arabic letters connectivity is not universal or linear. Letters are not always joined within words and when they do join, they are not always joined in the same manner. Arabic letters in a typical textual snapshot are either completely isolated or partially connected from one side in most

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words. This nonlinear adaptation of both isolated and connected forms clearly indicates that Arabic was directly derived from a script with completely isolated letterforms, like south Arabian al-Misnad, which incidentally shares with Arabic all its letter sounds.

Analyzing their nonlinear connectivity, the Arabic letters can be grouped based on their ability to join or combine with adjacent letters in two categories: restricted and unrestricted. Unrestricted letters can appear isolated, joined with both preceding and following letters or joined with preceding letters only. Restricted letters are either partially or completely restricted. Partially restricted letters can appear either isolated or joined with preceding letters only, while fully restricted letters must always be isolated. Categorizing letters in the above manner is the first important observation of this study (*see figure 4*).

Examining traditional Arabic connectivity-triggered multiple shapes, one can make three additional observations.

- First: most medial shapes of restricted letters are not as crucial to legibility or visual aesthetics as handwriting speed.

- Second: final shapes are critically beneficial to legibility and readability only when unrestricted letters are used. They signal either end of words, since Arabic does not traditionally use spaces, or end of connected letters cluster preceding an always-isolated, fully restricted, letter, Hamzah. Placing a final shape before Hamzah seems to visually emphasize that its miniature shape must only appear isolated within words.

- Third: isolated shapes of unrestricted letters are in fact special visually-identical forms of their final shapes substituted when they follow any restricted letter or precede an always-isolated Hamzah.

According to the observations above, one can draw two important conclusions. First, utilizing carefully calculated space widths in modern Arabic fonts should eliminate the need for multiple shapes per letter. This is only partially true. Practically and due mostly to habit, Arabic text can benefit instantly by using final shapes for all restricted letters even when word spaces are included. Second, Arabic letters should be classified into two essential shape categories not four: normal and final shapes, where final shapes are only associated with unrestricted letters.

It is important to observe that the differentiating final shapes in this typographic model are called final because they are final letter shapes in words or final letter shapes of connected letter clusters within words when preceding an always isolated shape. Providing adequate spacing and designing final shapes with minor or exaggerated characteristically-blended extensions added to their normal shapes would be a most beneficial model typographically and even educationally.

Figure 3 illustrates some of the observations above. The first line shows six words composed of unrestricted letters only. These linearly connected words are arranged in three pairs where identical letters having normal and final shapes are shaded. The second line displays six more words including both restricted (shaded) and unrestricted letters. Clearly, connectivity is nonlinear in the examples of this line. Notice the last word in the second line. The shaded Hamzah, as an always isolated restricted letter, necessitated a preceding final shape for the letter Baa to signal end of connected cluster. The third line lists seven words each including one restricted letter (shaded) at the end. The last line includes seven words each composed of restricted letters only. Notice that letters are completely isolated within words of both lines. Also notice that statistically, Arabic has far more words similar to those of the last three lines than the first linearly connected one.

بيتي بيت صبحي صبح علمي علم

يلوذ وريد خريف وميض عاقبة عبء

دوري ذرف وداع اوراق ارواح درب ذوات

زرزور وزارة وردة وداد دورة رادار رذاذ

Figure 3 Nonlinear connectivity of Arabic letters

The analysis provided in this section and illustrated by figure 3 clearly indicates that neither connectivity nor its consequential multiple shapes are Arabic script rules. They should be indicated and dealt with instead as specific stylistic needs appropriate for specific design cases. Arabic types with isolated non-varying shapes are as Arabic as traditional types. The font used in figure 3 actually employs completely isolated letters, a variant of it uses single shapes, yet both are readable.

In an Arabic font project, designers can manipulate letter separation widths, provide unified letter shapes with few or no alternative position-dependent glyphs, but still produce legible Arabic typefaces. Designing Arabic types without the connectivity restriction in mind may even allow designers more freedom to express the Arabic letters on various media. It frees their hands and minds by removing a persistent obstacle.

Horizontal toothy appearance

Confusing toothy spikes compounded with a horizontal appearance is a hallmark of an Arabic text look and feel. Most Arabic letter shapes are wide. The bulk of their structural information is distributed on or parallel to the x-axis. Higher statistical occurrences within words of 'toothy' wide letters (i.e., Baa, Taa, Thaa, Seen, Sheen, Sad, Dhad) add to this visual appearance even further. As with multiple shapes per letter, the main culprit behind this toothy appearance is also connectivity. Arabic shapes when isolated, even in initial word positions are highly distinguishable. But letter connectivity produces toothy spikes naturally, especially when utilizing miniature medial shapes possibly to insure handwriting speed.

Still, one should point out that Arabic's toothy look is more a hallmark of modern Arabic typography than its historical calligraphic schools. Genuine Naskh, or Naskh Ta'leeq styles do not appear toothy at all since their associated shapes do not collapse linearly along the x-axis. The main shapes contributing to a toothy appearance are not only the key shapes behind the problem but are also the key shapes for its solution. If designed appropriately, they can be the ideal shapes to set the entire tone of a typeface, vertically or horizontally. For example, in an Arabic detachable shapes type design, as with the Mutamathil type style, 'Baa' (u0628) is the first shape designed. It sets the entire font harmony and integrity. All other shapes should dance to its tone and rhythm. They should proportionally relate to its width, height and tooth shape.

What x-height value?

Without a doubt, designing a typeface with one fixed x-height value would be easier typographically than designing one with random values. But the crucial typographic benefit of setting an x-height value is not its uniqueness but rather its predictability. Designing a type with multiple x-height values is as easy or difficult as designing one with a unique x-height value. It is true that Arabic body shapes are not confined to three uniform fixed y-axis values, but they do not ascend and descend randomly. In a harmonious design, they should adhere to multiple y-axis values determined by their relation with each other.

One can certainly create valid Arabic fonts by giving its shapes a fixed x-value. But this is not a necessary step to solve a problem since there is no real problem to start with. Ascender and descender values of 'Alif,' 'Dal' (u062F), 'Baa' and 'Ayn' can certainly be adequate reference points to work with in any Arabic typeface design project (*see figure 3*). Still, many argue that an Arabic typeface is more harmonious with Latin typefaces only when it shares its unique x-height value. If this is true then assigning multiple x-values to Latin can do the trick too.

Dots and vowel diacritic marks

Are those many Arabic dots really a problem? An honest answer is no. Adding dots in Arabic was and still is a remarkable evolutionary step. They not only make letters clearly distinguishable from each other but they have preserved Arabic script simplicity, a fact that should especially be appreciated by modern digital typography. Imagine if the masters of Arabic scripts had created 'Vs' for all those Arabic 'Us.' How many additional shapes one would need to remember and deal with? Adding dots was so powerful and useful a step that its practice was even expanded by the many nations adopting Arabic script. For those who may have difficulty counting the dots, various Arabic calligraphy schools represented dots by equivalent shapes not much different visually than the Latin diacritic shapes used today. A type designer can certainly eliminate all dots by combining them into visually equivalent marks.

Excessive dots and diacritic marks may seem to compound an Arabic random x-height appearance, but this is not the case since dots are placed relative to shapes' bodies. Dot sizes should be adequately proportional to letter body size and identical throughout the entire font.

Finally, soft vowel diacritic marks (Harakat) are required in Arabic despite the fact that they are only used occasionally. Like dots, they are placed relative to shapes' bodies even though this, we believe, is not a good design approach. Except for those placed on 'Alif' and 'Hamzah,' all soft vowel marks should be positioned above and below letters at two uniform, adequately distant, locations to preserve shapes' integrities and emphasize vowel diacritics from dots and other mark diacritics.

Typographic blueprint for an Arabetic type design

After examining the underling Arabic alphabet, its shape variations and letter connectivity behaviors and other related philosophical design issues, a list of useful type design considerations is presented. A brief discussion and analysis of letters and shapes follows, aided by the three typographic charts displayed in Figures 4, 5 and 6. Any Arabetic script can be constructed utilizing a specific set of the letter skeletons displayed in Figures 4 and 6. Actual glyphs are created by adding various dots and diacritic marks to these skeleton shapes. The glyph set of Figure 5 illustrates with relational details one such script letter set for the case of Arabic. Figure 6 repeats the relational details of Figure 5 for all body shapes required to construct any other Arabetic script.

Initial design considerations

1. Decide whether shapes will be connected, virtually connected or completely isolated. Connectivity is a design issue not a script rule. Isolated or connected shapes should

preserve their visual characteristics regardless.

2. Letters should have one normal shape assigned to a unique Unicode value. Additional optional final shapes may be added to all unrestricted letters. In a typical software environment, a normal shape would then be the default shape. Generally speaking, normal shapes in this design model resemble initial forms while final shapes resemble isolated forms in the traditional four glyphs model. Additional medial, initial or ligature shapes may be necessary depending on the nature of a design project. In an Open Type environment, designers should utilize the rich logical features provided to force isolated shapes first, add multiple glyphs per letter, ligatures or other desired behavior.

3. Design fonts for Arabic script first. It is the common denominator of most Arabetic scripts. Glyphs added by other derived scripts are variants of Arabic glyphs that only differ from them by additions of dots or other diacritic marks, or by glyph behavior and utilization.

4. Baa is the best letter to start with followed by Alif. These two shapes define the font's harmony and style.

5. When designing extended Arabic fonts with one glyph per letter, one must handle carefully cases of restricted letters having different final shapes, and also similar normal ones, like 'Qaf' (u0642) and 'Faa' (u0641). The number of dots is not enough to differentiate them in a text since some scripts use both 'Qaf' with two dots and one dot. Designing single glyphs for such letters should include a hint of their final shape characteristics.

6. Design dimensions of certain glyphs should be calculated early on to handle all dots and other diacritic combinations not utilized by the Arabic script. For example, glyphs with one dot in Arabic can take four dots in an extended Arabic environment.

7. Dots are crucial to Arabic glyphs. They should be generously emphasized. Dots do not necessarily need to be distinguishable from each other in a cluster but their overall combined shape must be clear in order to identify various letters. Dots should be positioned relative to individual body shapes.

8. Even though Arabic had few right 'slanted' styles in its earlier days, visually generating slanted variations based on script ordering direction makes more sense. Right to left ordered Arabic italic styles should be slanted to the left to achieve harmony.

9. The so-called 'Arabic numerals' used globally today are also heavily used in the Muslim and Arab worlds and are rapidly replacing Indic-Arabic numerals. In an Arabetic font, these numerals should look harmonious to Arabic shapes. It is not enough to rely on their default Latin designs.

10. Ligatures formed by transforming two or more adjacent shapes into one, are not required in Arabic. The 'Hamzah' combinations, which can be thought of as ligatures, are part of the Unicode Arabic alphabet now. The 'Lam-Alif' ligature and its diacritic variations can be handled as two adjacent letters. But it is highly recommended to include it for readability improvement.

11. 'Tatweel' (or 'Kashidah') (u0640) is a swash like extension appended to letters anywhere within words. It is a useful glyph in Arabetic fonts used primarily to adjust widths of cursive words. In an isolated shape design Kashidah should be a zero width

glyph. But since a corresponding key is available on all Arabetic keyboards, it can be used in a font to trigger substitutions of wider glyphs in order to accomplish a similar word extending effect.

12. Kerning is as beneficial in Arabic fonts as in Latin, but it is not as crucial. In the model presented by this study and depending on design style all restricted letters may need added built-in white space extensions to emphasize their separation from following letters. This can also be accomplished through positive kerning. The width of added white space should be determined by language (i.e., final Ha shape function as vowel in Kurdish) and/or design.

13. Designing Harakat should be left to the end. They are required but are only occasionally used. Some scripts do not use them at all. When utilized in scripts, all Harakat can combine with all letters. Except for those positioned on 'Alif' and its diacritic combinations, designers do not necessarily need to position them individually on each and every letter. It is crucial to distinguish Harakat from glyphs including built-in dots and other diacritics. It is best to position them by design above and below maximum font ascender and descender boundary lines. Harakat should have zero width.

Discussion and analysis

All members of the Arabic Unicode alphabet are grouped within the typographic chart of Figure 5 to illustrate similarities and differences of normal and final shapes. Letters are grouped in two sets: unrestricted letters on the right and restricted letters in the shaded area on the left. As was explained previously, Arabic requires multiple x-height values. A background with typical multiple x-height values is included to help designers establish font baseline and glyph dimensions relative to each other and maximum ascender and descender values. Solid black glyphs are the minimum required glyphs needed to create a font for the Arabic script. They are referred to in this study as normal shapes and should be assigned unique Unicode base values.

The faded glyphs are optional final shapes or ligatures only needed to improve readability. Final shapes are given to restricted letters only. Furthermore, glyphs that differ from each other by addition of dots or other diacritic marks are grouped together for comparison. These glyphs have identical body shapes.

Specific glyph groups are highlighted by horizontal shading to indicate that member glyphs, in their final shapes, should have identically extending final body parts horizontally or vertically (highlighted groups 1, 2, 3, 4 and 6) or have parallel harmonious shapes (highlighted group 5). Notice that final shapes' endings and descender values should be identical within each highlighted group.
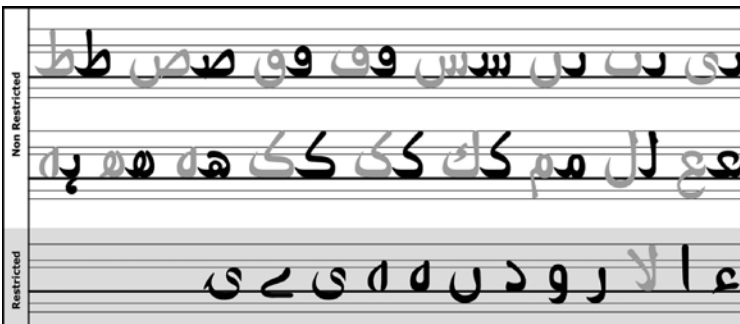

Figure 4 Body shapes of the extended Arabic script grouped according to connectivity behavior

Figure 5 Complete typographic glyph chart of the Arabic script

Figure 6 Complete glyph body shapes typographic chart of the Arabetic scripts

Additionally, three vertical rectangular boundaries are drawn around certain glyphs to indicate that these member glyphs should have identical normal shapes but different final ones (boxed groups 1 and 2) or identical body shape parts (boxed group 3). In a one glyph per letter design, special care must be given to glyphs in boxed group 2 and 4 to distinguish them when used together within words. Boxed group 4 includes glyph of the letter Alif with its 'Hamzah' variants and 'Lam' preceded ligatures. The Lam Alif ligatures are recommended but not required. Notice that glyphs of boxed group 3 set font's maximum ascender value while glyphs of highlighted group 6 set maximum descender value.

The inset figure illustrates required, but occasionally used, Arabic soft vowel diacritic marks, or Harakat. They are shown here larger than their actual sizes when positioned above the glyphs of Figure 5. Notice that their positions relative to font's maximum and minimum vertical values is appropriate for all glyphs except for the glyphs of boxed group 4 where they need be positioned manually relative to Hamzah diacritic marks.

Figures 4 and 6 show the entire body or skeleton shapes needed to design a font that can handle Arabic and any additional script derived from Arabic. Figure 6 is almost identical to Figure 5 except for the inclusion, within circles, of extended Arabic additional shapes. Actual glyphs for various scripts are formed by combining the shapes of this figure with several dots or other diacritic marks possibilities. When creating Arabetic fonts, designers should consult the latest Unicode standards code chart for full listings of such possibilities. Highlighted and boxed glyph groups in this figure correspond directly to those of Figure 5. Notice the additional vowel diacritic marks added to handle additional scripts.

CONCLUSION

Designing Arabetic fonts is not really complex nor is the underlying Arabic script itself. As a matter of fact, less independent shape designs are required for most Arabetic font projects than for Latin. While this study establishes connectivity as the main culprit behind most Arabetic typographic complexities, it does not advocate its abandonment. Instead, it promotes deeper understanding of it in order to establish an open design environment where both cursive and non cursive styles can coexist. It is imperative that glyph design should not always be tied to connectivity. Creativity should not be wasted on forcing shapes to connect at any expense. Arabic and derived scripts are flexible and powerful enough to encompass wide design variation. The key new typographic concepts of this analytical essay are, first, in term of connectivity: letters are either restricted or unrestricted and, second, in term of shapes, all letters have one normal shape, but unrestricted letters can be assigned an additional final shape. By systematically analyzing shapes and behaviors, this study offers a solid Arabetic typographic model. The offered design principles are useful for both traditional and non-traditional Arabetic font designs. The philosophical analysis presented should at least soften the loud drums of design censorship still performing individually and within corporations after centuries of typography.

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BOOK REVIEWS

Acting with Technology, Activity Theory and Interaction Design
Victor Kaptelinin and Bonnie A. Nardi

Activity theory develops a holistic view of human action in the environment and seeks to unify consciousness and activity. With its roots in the Russian cultural-historical psychological tradition of Lev Vygotsky and Aleksey Leontiev, it can be seen as the earliest form of an ecological approach to perception that was later championed by J.J. Gibson. Activity theory was developed further and adopted as a basis for human use of technology. In particular this book argues for its efficacy as a theoretical underpinning for interaction design.

Acting with Technology focuses on three questions: "what impact has activity theory had on interaction design: how does activity theory relate to other theoretical approaches and what does 'activity theory' really mean" (p. 4). This theory is presented as the antidote to traditional HCI user and system representations, in that it bases work on real life use of systems. It is a shift from the programming model of human behavior to situated action with its improvisation and opportunism that are more characteristic of human approaches.

Activity theory bridges the gap between motivation and action and it admits competing motivation between multiple subjects. Also important to this theory is tool mediation and social learning. In fact, learning is a theme that runs throughout the book. Accessibly written, some indepth discussion may go beyond what the reader desires; chapter 8 on Historical Currents in the Development of Activity Theory is such a case, but the chapter is immediately flagged for its specialist orientation. An extensive and practical Activity Checklist is presented in appendix A and can be used as a tool for design and/or evaluation.

This is the most understandable and complete discussion of activity theory around. It has broad application within interaction design, organizational design and learning.

Evocative Objects, Things We Think With
Sherry Turkle, editor

Designers are increasingly interested in how emotion plays through objects to bring enhanced meaning and pleasure to people. Designers also make objects (prototypes) that help them think about things that without a concrete instantiation would be at least invisible and perhaps unthinkable—certainly not shareable in an actionable way with others. Objects shape action and designers engage in the trial and error associated with such shaping—from both ends—from object construction and user action perspectives.

In this collection of brief personal stories, the objects are given, they reveal the intellectual and emotional connection the authors have with specific objects that have been instrumental in their lives. Organized into sections on design and play, discipline and desire, history and exchange, transition and passage, mourning and memory, meditation and new vision, the editor adds to and deepens the collection with references to art, literature, philosophy and science.

These are objects that trigger memory or help one face intellectual or everyday conundrums. A cello, philosopher's stone, rolling pin, keyboards, Foucault's pendulum and superheroes, as examples of the range of objects within the book, are emblematic of the attachment between people and things in these essays, written by well known 'thinkers.' Each essay contributes to an understanding of the many ways in which artificial objects or our selection and attention to phenomenon in creative terms shape us. This is a book to pick up serendipitously. From another perspective—the objects as given—it can provide perspective for designers as they consider the particular objects of their attention.

Laws of Seeing
Wolfgang Metzger

Cambridge, MA: MIT Press, 2007
ISBN 0-262-13467-5
Hardbound, 203 pages, black and white, Illustrated, $48.00

New Typographic Design
Roger Faxcett-Tang

New Haven, CT: Yale University Press, 2007
ISBN 10:0-300-111775-2
Large format, 192 pages, full color, heavily illustrated $35.00

Few design programs examine what is known about visual perception, yet this is a fundamental platform on which communication occurs. Nevertheless some students stumble upon perceptual principles, but this often happens in a haphazard fashion. Gestalt principles are among the more common phenomena presented in design education and in this regard *Laws of Seeing* is a classic study.

Originally published in 1936, Wolfgang Metzger's book was finally translated from German by Lothar Spillman. Wolfgang Metzger was a leading figure in Gestalt psychology and this book presents Gestalt concepts with drawings, photographic demonstrations and suggested interactive experience that make the concepts come alive.

The Introduction puts the book in the context of the visual theory of its time. This has historic value, but what would be more useful is a chapter that places the book within contemporary theory and the renewal of interest in Gestalt. It could also place the book in relation to J.J. Gibson's ecological approach to perception. Of course the Introduction in question was written by Metzger and is therefore limited to his time.

The book itself appears to be a reprise of the original with the same diagrams and photographs—even the design of the book looks dated and closer to 1936 than 2007. If used as a text for design students, and it certainly could be used in this way as it is clearly and accessibly translated, the teacher would be wise to find additional, more contemporary illustrations of visual phenomena that would engage today's students. The book provides a context for teaching Gestalt principles and should be required reading and viewing for anyone who constructs experience within the realm of the visual.

A beautifully designed and printed selection of typographic design, largely selected from European countries that use the Roman alphabet is presented here. The book is divided into four sections: type as form, type as image, type as experiment and type in motion. Each entry is accompanied by a paragraph that briefly directs the viewer to the structural essence or idea behind the typographic execution. Most of the examples are print-based.

The first section, type as form, demonstrates that the classic clarity of European type design (Dutch, German, Swiss) retains its vigor and aesthetic resonance today. The second section, type as image, explores expressive tensions through the materiality of production, scale, contrast and the unexpected. Some examples in this section seem flux-like or have pop culture or 1960s roots. Type as experiment, the next somewhat smaller section, presents experimental fonts and pictographic systems along with dimensional, sculptural letterforms. The last and smallest section, type in motion, shows three-dimensional, environmental typographic installations whose 'motion' is a function of viewer movement. Some film and video based typography is also present, but unfortunately this section cannot be done justice in a print format.

While the selected work is interesting, high quality and recent, the 'new' in the title is not warranted. Nevertheless it is a useful book for students of typography interested in a range of typographic expression and who may benefit from the pithy comments that accompany the work and direct the viewing.

Print Is Dead, Books in Our Digital Age
Jeff Gomez

Written from a popular culture perspective in an accessible way, the author is not a techie but a technophile. He focuses primarily on literature and reading for pleasure within the context of generation X's habits. These habits include the revolution brought about by music downloading. Possession of the record, tape or CD was not the goal—the goal was access to the music. In a similar way, his argument rests on the notion that books themselves are not the object of desire, but desire is directed to the stories they contain. This is developed further through the realization that the vehicle for the story—whether paper or screen—is unimportant, which according to the author, publishers are slow to understand.

While a cheerleader for Internet access to information, he is not critical about how people use or accept the information they find there. Except superficially, there are no analyses of what an ebook can do that a print book does only in a limited way, or conversely what attributes a print book possesses that are impossible in an ebook. The cost of publication, whether on screen or paper, appears to be unknown to readers. He describes the consumer resistance to purchasing book contents for ebooks at a price similar to the paper version. This resistance is based on the fact that there is no paper, printing, binding or distribution costs, hence the cost relative to a paper book should be substantially reduced. What the consumer doesn't understand is the first cost of publishing—the author's time, the editor's selection and attention to detail, the designer's attention to typography, images, pacing, etc. Developing an appropriate and understandable business model for an ebook is the crux of the problem and this he does discuss.

When online content is so readily available, when open source contributions like Wikipedia are not questioned, when quality of information is not examined by source or existing knowledge, then the value placed on first cost of publishing becomes questionable. When it comes to content—let the buyer beware.

Underground Maps After Beck
Maxwell J. Roberts

This highly focused book on the London underground and its visual articulation for riders concentrates on the period following Beck's tenure from 1933 to 1960; it covers forty-five years from 1960 to 2005. It does not ignore the early work, prior to Beck and the evolution of his work as well, thus the reader gets a complete picture of the visual experiments and understandings that mark the development of the London Underground map.

The author would argue that it is a less a map and more a diagram. The diagram ignores actual distances in favor of legibility; respects inter-line relationships to facilitate transfer; and removes all extraneous detail, including geographical references to what is above ground. Traveling in the tube is an abstraction—there is nothing to view—it is a kind of inward journey. Movement is point-to-point, as such the diagram seems appropriate as it too is an abstraction. The important trade-off is geographical orthodoxy for diagrammatic sense in representing a complex system.

A cartographer or designer might write this book, but in this case the author is from psychology. The book requires someone able to look carefully and analytically into the details of the evolution of this project. Working through the details for a sound representation of a complex system requires attention to perceptual principles and development of a graphic system. The author examines the codes in use and the typography for clarity and consistency; he also recognizes the constraints related to size.

This is an evolutionary design that is well presented through numerous visuals with details calling attention to issues and resulting changes. The book can be viewed through its sequential images with detailed captions that flag important change as well as read in a more conventional sense. Sometimes the author is too familiar with the underground system and the non-British reader needs to hunt for the visual reference. Here knowing line name colors becomes critical; to accommodate the foreign reader a reference legend of line names and colors at the front or back of the book would prove useful.

The last chapter begins with a composite diagram that presents from left to right a diagrammatic history of the

London Underground representation. Here the changes in marking and typography make the evolution clear. This is a book of subtlety; it explores details that most underground users take for granted and that only designers struggle over, yet are key to communication success.

Given the clarity of the underground presentation, it is easy to forget that this is a system that has expanded, that is subject to renovation, terrorist attack and the occasional derailment. Its regularity and robust nature make such fundamental aberrations seem less important. But as this system interfaces and integrates with the overall metropolitan transport service to the hinterlands, a new diagrammatic strategy is needed. And this new strategy will inevitably move from print to electronic display regardless of whether handheld or large in scale. When fare zones, transfer points, regularity of service and so forth need description, an all at once display will yield to one that filters and focuses the information needed. Where Beck created a system based on space, the new one, whenever it happens, will join space and time.

Words to be Looked At, Language in 1960s Art
Liz Kotz

The information age was in its formative moments, clunky mainframes ruled the day, but they were harbingers of the ubiquitous digital time to come. A few musicians, poets and artists considered the material existence and referential function of words. Recovery of direct experience was the goal—attention was paid to the sign itself and its instrumentality. The old dichotomy of word and image evaporated—words became images. Traced to John Cage and his scores for performance, this book takes a primarily chronological view of the artistic events that followed from his breakthrough. It explores experimental music, poetry and performance art in its desire to crossover and unite these separate but related streams of creation.

The discussion is bracketed by extremes, in the first chapter, Cage's "silent composition" 4'33" (1952) is discussed as a seminal object, and in the final chapter, Andy Warhol's a : a novel (1968) represents the ability to capture and transform lived experience. The first is about silence and the second about endless (24 hour) talk. Fluxus, minimalism and conceptual art underpin discussion of selected practitioners: John Cage, George Brecht and Lamonte Young in the chapters on scores, John Ashbery and Mac Low in the chapters on poetry and Carl Andre and Vito Acconci in chapters on visual art. Written from an art historical viewpoint, other artists make cameo appearances as the author develops connections rather than a survey of related work.

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CALL FOR PAPERS

SPECIAL ISSUE

COMMUNICATIONDESIGNFAILURES: FUNCTION & INTERPRETATION SCRUTINIZED

A professor of perceptual psychology remarked that it was a pity that there was no journal of negative results or failures in experimentation. Without such a journal we continue to go down blind alleys and make avoidable mistakes. Because communication design encompasses so many variables, to say nothing of the problem of interpretation or communication reception, in a loose similarity, design projects are not unlike experiments. Yet like perceptual psychology and other social science disciplines, discussion of failure is rare. Even less than social science whose research questions form grounding for experimentation, design practice is pragmatic and designers quickly move to the next project with little reflection on degree of success or reasons for failure. Communication design, whether print, screen-based or other media rarely publishes any reflection on projects, but relies on celebratory awards and professional presentations with little critical examination.

The aphorism we learn most from our mistakes is at play in this special issue. *Visible Language* invites academics, authors, design practitioners and frustrated users who have observed failure in their contact with communication design in its many guises, whether as a designer or as a user, to document and analyze failures. Don't be timid— share your failure or that of another—be critical and analytical and develop positive criticism that might lead to new insights or even a remedy.

Guest editors: Dietmar Winkler and Sharon Poggenpohl

Two perspectives will be presented—that of designers and users. Reflection on experience, case studies and research are welcome.

Possible themes
— experience and reflection on failure
— failure as a unique or replicable situation
— measurement of failure or success
— function in communication design
— aesthetic failure and its gestalt
— failure in design process
— user developed workarounds
— interpretation issues
— cross-cultural issues

Examples of failure
You may also submit visual documentation of a vexing failure with brief commentary instead of an article. These examples will be credited to their observer/commentator and will be assembled as a collective portfolio.

Submission guidelines for papers
— abstracts are 250 words maximum
— articles are around 5,000 words and appropriately illustrated
— author guarantees that the work is previously unpublished
— all textual material has double-line space
— all visual material is sent at 300dpi as jpeg or tiff in separate files

Submission guidelines for examples
— brief description of failure
— nature of documentation

Schedule
January 1, 2009—Abstract deadline
January 15, 2009—Review of abstracts
July 1, 2009—Submission of full paper
July 15, 2009—Review of submissions
November 1, 2009—Target publication date, VL 43.3

If you would like to pass an idea to one of the editors for brief comment before proceeding, contact either Dietmar or Sharon.

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