

Graphic Symbols—Design And Meaning

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Abstract

This paper includes a study of 52 different pedestrian warning and information crossing road signs from 32 different countries. Every situation and every context demands a consistent use of symbols, an explanation of the symbols used, and learning of the meaning of those symbols. Well-designed symbols can be used, and can work in different cultures, in different parts of the world.

Introduction

The use of symbols have a long tradition. Symbols first appeared as paintings or carvings on caves and stone walls as early as 50,000 BC, with the first depiction of humans dating back about 11,000 years (Dewar, 1999). There is a need for various symbols in modern societies. Taking up only a very small amount of space, symbols can convey information, equivalent to one or more sentences of text. Quirk, Greenbaum, Leech, and Svartvik (1985) noted that pictograms most reliably can substitute for words in “block language”—single-word captions, headings, and labels—as distinct from sentenced language. Eco (1976) suggested that the verbal equivalent of an iconic sign is not a word but a phrase or indeed a whole story. This is, of course, also the case with the large number of Chinese kanji-characters, designating different words and sometimes phrases. The modern symbols typically found in airports and in travel guides are intended to convey generalities of the same order of abstractness as words. Their characteristic graphic neutrality is perhaps the most significant aspect of their invention by the Isotype Institute (Neurath, 1936).

Symbols may be visually more distinctive than text. Their syntax and semantics may be simpler. Image perception is rapid, virtually “instantaneous.” Reading and comprehending the equivalent message in words takes much more time, and may fail if it is hard to read the text. So symbols permit rapid reading and comprehension, and they may require less time and effort for learning. This is important in numerous situations, e.g., in traffic, in industry, and in aviation. With the increase in international travel and trade, there is a growing need to communicate with people who do not understand the language of the country they are in. The use of symbols is one of the most common ways to deal with this situation. However, there may also be some disadvantages with symbols. Symbols may be less efficient than text in conveying abstract, as well as detailed information.

When designers in different countries are working on

similar problems they may create different solutions and different designs. In each case, they may have clear intentions and objectives with his or her information sets. However, it is always up to the interpreter/s to conceive or misconceive information, to use or not use it.

It is reasonable to assume that (1) a specific message may be communicated to the receiver/s or interpreter/s with several different symbols. It is also reasonable to assume that (2) a specific symbol may be used to communicate several different messages. If the assumptions above are correct it would indicate that (3) we will normally have to learn the intended meaning of symbols.

Different Representations

Visuals can be classified according to various criteria. Doblin (1980) classified iconographic (visual) information into several categories: *isogrammatic* (photography, drawing, and drafting), *diagrammatic* (charts, graphs, or diagrams), and *ideogrammatic* (symbols that attempt to convey a highly specific meaning, such as a road sign). Cochran (1987) distinguished between actual events/objects, *iconic re-presentations*, and *arbitrary representations*. Examples of iconic representations are film and TV-images, still photographic pictures, and realistic art work. Computer graphics, symbols and signs, and words are all examples of arbitrary representations. Here, no cues from actuality are left. Hunter, Crismore, and Pearson (1987) presented a classification as points along a continuum from realistic to abstract: photography, artwork, diagrams and maps, graphics and formulae, tables and charts, orthography (icons), and verbal symbols.

For Wileman (1993) all kinds of representations of any object are symbols. He argues that there are three major ways to represent objects ranging from concrete to abstract representations. The first group, *pictorial symbols*, includes photographs and illustrations or drawings. Viewers should easily be able to translate a pictorial

symbol to a real-world example. The second group, *graphic symbols*, has image-related graphics, concept-related graphics, and arbitrary graphics. Image-related graphics can be characterized as silhouettes or profiles of the object. Concept-related graphics look like the object but have less detail than image-related graphics. Arbitrary graphics are abstract symbols for objects, constructed out of the designer's imagination. The third group, *verbal symbols*, is divided into two sub-groups, verbal descriptions and nouns or labels. Verbal symbols can be understood only by people who comprehend the language used to describe the objects.

However, in my view, there seems to be no major difference in "abstractness" between the abstract arbitrary graphic symbols and the verbal symbols. Based on the above classifications I prefer to distinguish between two main categories of representations, (I) figurative representations, and (II) non-figurative representations (Pettersson, 1993). Figurative representations include two subgroups: (1) visuals and (2) graphic symbols. Also non-figurative representations include two subgroups: (1) verbal symbols and (2) non-visual representations.

In this paper, the main focus is on *graphic symbols*, and its three subgroups pictorial symbols, abstract symbols, and arbitrary symbols. Graphic symbols may represent objects as well as ideas. Functional graphic symbols are actually older than words. They are found in every culture however primitive. In specific areas symbols are a supplement to all languages to help create better and faster understanding. Graphic symbols have evolved to the point of universal acceptance in such areas as music, mathematics, and in many branches of science.

Pictorial symbols (or representational symbols) are "image related" and simplified pictures. Pictorial symbols resemble the objects they represent. They can be characterized as *silhouettes*, shadows, or profiles with no surface detail. A traffic sign with a silhouette of a locomotive, to denote a railroad crossing, is an example of a pictorial symbol. (See Figure 3.)

In the design process, some pictorial symbols may be successively simplified into figurative and *abstract symbols*. To some extent, abstract symbols still look like the objects they represent but they have less detail than pictorial symbols and they may consist of several graphical elements; dots, lines, and areas. In athletic contests, like the olympic games, abstract graphic symbols are often used to denote the different kinds of sports. Good abstract graphic symbols are intuitive and we should be able to understand their meaning without any problems.

Some figurative symbols are *arbitrary symbols*. They

are invented and constructed out of the designer's imagination. Usually arbitrary graphic symbols have no resemblance at all to the objects or the ideas they represent. Many are based only on the use of geometric shapes and colours. Many signposts and some traffic signs are examples of signs with arbitrary symbols. Arbitrary symbols are unambiguous by convention. We agree and decide on their meaning. Just as new terms have to be learned when we begin to study a new topic, we have to learn arbitrary graphic symbols, and every motorist have to pass a test in order to get a driver's licence.

Use Of Symbols

Pettersson (1985, 1987) concluded that *perceived image content often is different from intended image content*. Even simple pictures and also symbols may cause many different associations. A given set of basic picture elements and symbols can be combined to form completely different images. Moriarty and Sayre (1993) studied intended and perceived advertising meanings. They also found a high level of *disagreement between intended and perceived messages*. More than half of the responses were different from those intended, and expected by the message creators.

Symbols must be meaningful, legible, learnable, memorable and used consistently (Dewar, 1999). The meaning of a symbol is seldom easy to guess. Pettersson (1989, 1993), Griffin and Gibbs (1993) and Olmstead (1999) found that graphic symbols were interpreted in many different ways. Sometimes only a few persons will understand the intended meaning of a symbol. Thus, the sender will always have to supply explanations for the symbols used in any specific situation.

Griffin *et al.* (1995) studied how international business people interpreted and understood commonly used clip art graphic symbols. The symbols were taken from a Harvard Graphics software package for business presentations. Based on 4.530 opinions expressed by 302 subjects in Japan, Sweden, Tanzania and USA, regarding 15 of the symbols in the software package, Griffin *et al.* made the following two conclusions:

- There are many ways to interpret symbols. Very few people share the same understanding of any given symbol.
- There are strong cultural differences in interpreting the meanings of symbols.

Four *verbal symbols* resulted in many interesting observations. Symbols in this category were either understood or not understood at all. There were 90% appropriate answers from the subjects in the USA and 80%

from the subjects in Sweden. For Tanzania and Japan, the corresponding numbers were 27% and 29% respectively. The rank ordering of the mean numbers of appropriate answers for seven *pictorial symbols* was 80% for USA, 69% for Sweden, 60% for Tanzania, and 48% for Japan. The remaining four *abstract symbols* were the most difficult symbols for all audiences to comprehend. Here definitions differed strongly by symbol and by country. In this study, it was common for the subjects to give several meanings for each symbol. For example, the 81 Swedish subjects gave 20 different interpretations of a symbol with the shape of a star.

Cochenour and Rezabek (1998) studied the interpretations of 21 sepulchral symbols. Respondents showed a wide disparity regarding their ability to understand the meanings of the symbols. Nineteen percent of the responses indicated that no meaning at all was conveyed, while 31% were considered as “understanding of the intended meaning”. It was concluded that symbols carry a variety of meanings for different people and when used alone as a means of visual communication cannot be expected to always convey a simple and direct meaning. Cochenour, Rezabek and Westhoff (1999) studied the interpretations of 12 graphic symbols. In this case, 96 respondents showed a wide disparity in their interpretations, with as many as 51 different categories of meaning for a single symbol. The average number of no-meaning responses was 13.

Nilsson and Lindqvist (1995) examined a random selection of telecom publications. They browsed about 1,000 pages. From this material Nilsson and Lindqvist selected 100 pictures and registred about 350 symbols. This study concluded that:

- A certain meaning is explained with several different symbols.
- A certain symbol has several different meanings.

At the end of his book on writing for science and technology, Kirkman (1992) noted the possibility of using symbols in international communication (page 155):

Perhaps, since use of words causes so much difficulty in international communication, we should abandon words wherever possible, and use icons instead.

Kirkman used the term “icon” in the same meaning as I use the term “symbol” here. Symbols may very well become more and more common in international communication. Kirkman commented (page 156):

I have no doubt that we shall gradually have to include more and more icons in our presentations of information, especially in our onscreen presentations.

Many pictograms are culturally biased (Mangan, 1978) and thus arbitrary to those from other cultures. For example, when using a guidebook with symbols, we often have to look them up in a key in much the same way as we look up unfamiliar words in a dictionary. Their iconic origins may only become apparent after we are aware of their intended meaning (Waller, 1987). Baron (1981) reported that iconicity is a surprisingly unimportant factor in the learning of sign-languages for the deaf, autistic, or mentally retarded.

There are many reasons to use symbols. Graphical symbols can be used effectively in manuals and on screens to help readers to quickly recognize and *identify* a specific message. Symbols can be used to create an *overview* and provide a holistic perspective. This property is utilized in maps and informative signs as well as in catalogues and project reports.

Symbols can be used to illustrate the spatial and geographic *position* of different objects or services. One example is the floor plan of an exhibition hall with symbols designating the location of telephones, lavatories, information booths, and refreshment sites. Another example is maps with cartographic symbols for objects and conditions. Symbols can be used to illustrate *size* relationships and to supply numerical and statistical information. Many symbols in maps are such examples.

Symbols can be used to *represent* an organization, a service, or a product. Trademarks and logos are very common in marketing, advertising, and public relations. As a rule, promotion begins with a name, followed by the name and a symbol. Ultimately, the symbol alone suffices. Examples are McDonald's yellow M, and Shell's scallop. Symbols can be used in graphics and in image maps for easy *navigation* in databases. Symbols can be used to *supply instructions* and *information* about appropriate behavior in different situations. Numerous examples can be found in catalogues and timetables. Many symbols are used for *warnings*. Dewar (1999, p. 286) divides symbols into five main categories: (1) industrial and occupational (in the workplace); (2) representing methods (machines, instructions); (3) management of public places (transportation, museums, hospitals); (4) knowledge; and (5) particular activities (sports).

Warnings

As previously noted many symbols are used for

warnings. Wogalter (1999, p. 94) concluded that warnings should contain certain elements:

- a signal word such as “Danger” and “Caution” that enables people to recognize that the message is a warning, that a hazard is present, as well as providing information on the hazard level (with “Danger” signalling more serious and probable injury than “Caution”);
- a description of the hazard, e.g. in the case of a no diving sign, a statement such as “Shallow water” provides information about the specific danger involved;
- a description of the consequences that could occur if the person fails to obey the warning’s directions, e.g. “You can be permanently paralysed”;
- the directions or instructions, i.e., the specific actions that should or should not be done, e.g. “No diving”.

In order to be effective a warning must reach the intended audience and make them adopt the desired behaviour. Several steps are needed here. Initially any warning, and any symbol, must attract and capture the *attention* of the intended audience, the persons who need the information. The message must be legible at the appropriate distance, and must often be legible when seen for a short period of time under bad lighting conditions. A driver on a highway may only have a second or two to read a signpost. Then the message in the warning must be mentally processed and *understood* correctly by the intended audience. The action to be taken should be immediately obvious. Furthermore the message in the warning must be able to motivate the audience to *comply* with the desired behaviour.

Wogalter pointed out that warnings should have properties that allow them to be seen in degraded conditions such as low illumination, smoke or fog. In addition warnings should be adequately lit by direct light or by back-lighting and/or have good reflectance so that they are visible under reduced-light conditions.

Design Of Graphic Symbols

Dewar (1999) pointed out that the specific criteria for individual symbols or sets of symbols depend on their application. Legibility distance is essential in the case of traffic signs and many building signs, but not for symbols on maps or consumer products. There is a need to have as much *uniformity* as possible across different information systems. Symbols are often composed of simple graphical elements, such as lines, circles, ovals, squares, rectangles, triangles, or combinations thereof. Distinctively shaped letters are often utilized. Regular,

simple, geometrical figures are identified more quickly than complex ones. Keates (1982) noted that discriminatory responses to map symbols depend on contrast in *form*, *dimension*, and *colour*. The problem of discrimination is generally more critical in monochrome maps, in which only contrasts in form and dimensions are possible for lines and small symbols.

The graphic symbol should be *simple* and *clear* with a distinct contrast to the background. A clear and stable figure to ground articulation is essential (Easterby, 1970; Dewar, 1999). The figure (“foreground”) should be stable, i.e. spontaneously organised as one unit. This is achieved by close boundaries, appropriate line thickness and any other graphical means that help the visual system to organise the figure as one unit. It is most appropriate to use silhouette (side) views of certain components such as vehicles (Dewar, 1999). The graphic symbol should be as symmetrical as possible. It should appear in an *optimal size*. A good symbol is designed so it can be used in many different situations and in many contexts. For example, the McDonald’s M or “golden arch” is designed to work in every conceivable size, from a few millimeters high in a brochure to more than six feet high in outdoor signs. It is often an advantage that a symbol is *iconic*, that is, that it looks like the real thing it represents. Then it may be intuitive to the users. In technical and scientific systems and documentation, hardware may be symbolised by squares and rectangles or the like. Software may be represented by “softer” forms, such as circles or ovals.

Graphic symbols often make use of bright colours to intensify their meaning—in fact in some instances a change of colour creates a diametric change of meaning. Common hues are pure yellow, red, blue, green, white and black, or combinations of the same. Colour creates instant impact. It becomes a vital part of the first impression created. Industry employs colour coding in many areas. The countless wires in a complex cable are instantly traced by their hue; the colours of knobs and buttons on vehicles and machinery signify what they control (Dreyfuss, 1972). However, since many people are colour-blind colour can only be used to code the information redundantly. Colour may be combined with shape or position. Complementary colours contrast and provide a warm – cool effect.

Warnings should have high contrast relative to the background (Barlow and Wogalter, 1991; Sanders and McGormick, 1993). They should have large, legible bold-faced alphanumeric characters (Wogalter, 1999). Legibility of symbols can be enhanced with the application of a few simple guidelines:

- Use realistic figures rather than abstract forms.

- Make important figures and characters large.
- Eliminate unnecessary elements.
- Use solid figures, not outline figures.
- Maximize separation between features in symbols.
- Maximize the luminance between a symbol and its background.
- Maximize the colour contrast between a symbol and its background.

According to Keates (1982), the use of colour on maps introduces a large number of variables which can enhance contrast, and therefore extend the number of perceptual differences that can be employed in discrimination. The effect is to *aid legibility*, and therefore to increase the total range of information which the map can present. Shape and colour components are often used for designating a link or relationship between groups of messages. The recognition of geographical features is much enhanced when areas are differentiated by hue. At the same time, complex colour arrangements may raise problems in discrimination, so that although multi-colour maps enlarge the graphic possibilities, they also increase the probability of errors in the judgment of discrimination. According to Keates (1982), the most common case of quantitative judgment on maps occurs in the use of proportional symbols, that is, point or line symbols constructed to represent specific quantities.

Many symbols are officially recommended by standardisation bodies like ISO (International Standards Organisation) and IEC (Commissioin Electrotechnique Internationale). Symbols are employed in different media. They are static and immutable in graphical media and may be more changeable in computer-based media. As noted in the introduction designers in different countries may be working on similar problems, and they will often create different designs. Most, if not all, countries have traffic signs. In order to study similarities and differences in the design of a highly restricted message I have analyzed pedestrian warning and information signs. This study is presented in the following section.

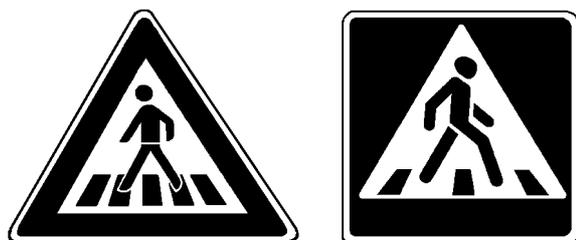
Pedestrian Crossing Road Signs

Traffic signs and signposts are various devices with symbols, placed along, beside, or above a highway, roadway, pathway, or any other route in order to warn, guide, and regulate the flow of traffic. The symbols may also be painted on the streets, and sometimes on the walls of houses. The traffic may include many kinds of motor vehicles, bicycles, pedestrians, equestrians, and other travelers. Road signs and signposts may be divided into four main groups: (1) warning signs, (2) mandatory signs,

(3) prohibitory signs, (4) information signs, and the STOP sign. Today road signs are manufactured in different materials such as aluminium, galvanized sheet iron, and flat or canned panel. The symbols on the signs may be painted, printed or duplicated in other ways. The motifs are designed in different ways even if they carry the same or similar messages.

In communication senders want to communicate messages or make information sets available to receivers or rather interpreters. In the case of warning for and information about pedestrian crossing road signs the city authorities are the senders. The *warning sign* for a pedestrian crossing (Figure 1a) convey a simple, but important message to the *motorists*: “Look out and slow down, there is a pedestrian crossing ahead.” This particular sign is used in Germany and in Luxembourg. The wide line along the edge of the triangular sign is red. The triangular area in the middle of the symbol is white. The three graphical elements representing a person and the five graphical elements representing street lines are black. This symbol is classified as abstract. The warning sign is usually triangular, sometimes with soft corners. The actual symbol consists of a wide line forming a red triangle on a light background. Graphical elements, dots, lines, and areas, are combined to form a simple figurative representation of a person. Some graphical elements may also represent street lines showing a pedestrian crossing.

Figure 1
A Warning Sign And An Information Sign



However, the *information sign* about a pedestrian crossing (Figure 1b) convey slightly different messages for two different groups of receivers. The message to the *motorists* and other road-users is: “Look out and slow down, pedestrians are told to cross the street here.” The message to the *pedestrians* is: “This is the place where you should cross the street.” The information sign is usually rectangular, sometimes with soft corners. The actual symbol consists of a large blue rectangle with a light

triangle. This particular sign is from Lithuania. The triangle is white. The four graphical elements representing a person and the three graphical elements representing street lines are black. The person appears to be running to the right. This symbol is classified as abstract. In Lithuania there are also signs with the person moving to the left. Graphical elements, dots, lines, and areas, are combined to form a simple figurative representation of a person. Some graphical elements may also represent street lines showing a pedestrian crossing.

In several locations this information sign is replaced by traffic lights. Traffic lights convey more distinct and “sharp” instructions to motorists as well as to pedestrians than pedestrian crossing warning and information road signs. Here the instructions may be expressed as “Drive now!,” “Do not drive!,” “Walk now!,” and “Do not walk!” respectively. The design of traffic lights may vary substantially. However, design of traffic lights is not included in this study, nor the sign explaining that children may be playing alongside the road as well as on the road.

Data

I have studied 52 different pedestrian warning and information crossing road signs from 32 countries (Argentina, Australia, Austria, Belgium, Chile, China, Cyprus, Czech Republic, Estonia, France, Germany, Ghana, Iceland, India, Ireland, Italy, Jordan, Lithuania, Luxembourg, Malta, Mexico, Monaco, Norway, Peru, Poland, Portugal, South Africa, Spain, Sweden, Switzerland, Turkey, and USA.)

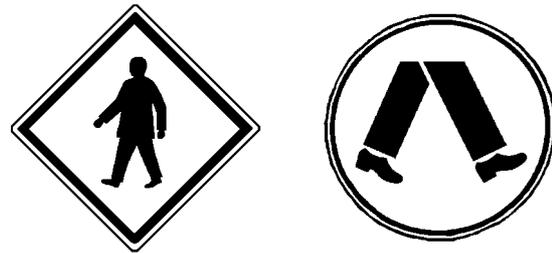
Some of these road signs were brought to Stockholm for a public exhibition in 1998. The exhibition *The World Walks in Stockholm* was put together by the graphic designer Anders Körling as an event during *Stockholm '98, Stockholm — Cultural City of Europe 1998*. I have taken photographs of the crossing road signs at this exhibition. I have also taken photographs during my travels in various countries. In addition, people have provided me with photographs of crossing road signs in a few cases. The pictures presented in this report have been scanned and retouched using Adobe Photoshop™. The design of pedestrian warning and information crossing road signs vary with respect to shape, colours, size, and number of graphic elements in the symbols.

Results

Pedestrian warning and information crossing road signs vary with respect to their shape, colours, size, and the design of the figurative representations. Differences in material and in the construction of the signs and signposts are not discussed here.

Shape. Pedestrian crossing warning and information road signs vary in shape in different parts of the world. In Europe warning signs are triangular (Figure 1a), and information signs are rectangular (Figure 1b). In other parts of the world the information sign may be rhombic or circular (Figure 2a and 2b). On the signs from Argentina and Australia the pictorial symbols are black on yellow backgrounds without indications of street lines. These symbols are classified as pictorial.

Figure 2
Signs From Argentina and Australia



Colours. Pedestrian crossing warning and information road signs vary in colour in different parts of the world. In Europe warning signs usually have white, black and red colours (Figure 1a). In Sweden warning signs are yellow, red and black. In many countries the information signs are blue, white and black (Figure 1b). In some countries the colours are white and blue; white, yellow and black; or yellow and black (Figure 2). The figurative representations are usually black, on a white, blue or yellow ground.

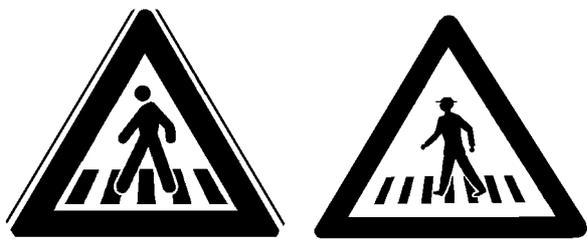
Size. Pedestrian crossing warning and information road signs vary in size in accordance with different situations. In this sample the smallest sign is 40 cm (Cyprus) and the largest is 102 cm (Argentina). Most signs are between 55 and 75 cm. Thus the impression of the pictures printed here corresponds to the impression from viewing the real signs on a distance of five to seven meter.

Symbol. The symbol on pedestrian crossing warning and information road signs vary to a large extent. Almost all are different with respect to their design. The person in the symbol is always “Mr. Walker.” Nowhere is the figure representing a woman (Jofs, 1998). Mr. Walker is an *abstract graphic symbol* (27), or a *pictorial graphic symbol* (25). As would be expected, there are no *arbitrary graphic symbols* in this sample of symbols. In one case (Australia) the sign only shows the lower parts of the legs and the feet (Figure 2b). For some reason most figures on the signs (44) are crossing the street to the left. The remaining figures (8) cross in the other direction, to the

right. Estonia and Lithuania have both versions of signs (Figure 1b).

Most figures (42) seem to be walking across the street over to the other side (Figure 3), but some (9) appear to be running (Figure 1b). In one case (Mexico) the figure appears to be standing and waiting for a possibility to cross the street. In two other symbols from Mexico the person appears to be walking. Some symbols are very clear and distinct, others are “blurred” by a large number of graphical elements. In figure 3a the person is an abstract graphic symbol on the warning sign from Malta, and a pictorial graphic symbol on the right sign, figure 3b, from Switzerland. In both cases the person is apparently walking to the left.

Figure 3
Signs From Malta And Switzerland



The number of graphical elements that are used to build the Mr. Walker figure vary (1–4), as the total number of graphical elements (2–21) in the symbols. Mr. Walker consists of one graphical element in figures 2a, 3b, and 4. He is built of two graphical elements in figure 3a. In figure 1a Mr. Walker consists of three graphical elements, and in figures 1b and 2b four graphical elements are used.

Figure 4
A Sign From France



The painted *street lines* form a graphic world of their

own. The number vary to a large degree. In some cases the street lines may actually confuse people. Figures 2a and 2b has no street lines. In figure 1b there are three graphical elements representing the street lines. There are five graphical elements representing the street lines in figures 1a and 3b. Seven graphical elements represent the street lines in figure 3b, and there are 19 distinct elements in figure 4. However, on the sign from France Mr. Walker consists of only one graphical element. I don't know to what extent the number of street lines vary in different countries. In Sweden there are four graphical elements on the symbols representing the lines painted on the streets. The number of painted lines may vary.

Discussion

There are probably pedestrian crossing road signs in most cities, at least where there are cars. In accordance with international conventions and national legislations on road signs and signals, most road signs have a similar design. For example, the official manual for signing in the United States is the *Manual of Uniform Traffic Control Devices*. Warning signs are triangular. Information or instructional signs are rectangular or rhombic. Prohibitory signs and mandatory signs are round, but with different colours. However, the symbols on the signs may differ in several respects. Every country has its own version, or rather versions, because some road signs differ between regions. Some of these signs may be old versions, waiting to be replaced. There are several requirements that must be fulfilled for road signs to be effective communicators of information. The *design* of the symbols, as well as the *contexts* in which the signs appear are important factors for our perception of the message. The abstract or pictorial graphic symbol on the sign must have good legibility and be easy to read from a distance. Obviously pedestrian crossing road signs must be placed in such a way that the motorists as well as the pedestrians can see them. Signs should be placed as necessary for safety and proper regulation of traffic. However, the use of too many signs within a given location severely reduce the effectiveness of each individual sign at that specific location. There is a distinct risk that we will not see, or pay attention to, some of the signs.

It is quite obvious that traffic symbols are designed in many different ways, even when they convey the same or similar information to people who see them. This may not seem to be an important issue, since people have to *learn the meaning* of all important symbols within their own society. However, with respect to the fact that international travel seems to increase all the time, and more people visit different countries, it would probably be an advantage to

have a “world standard” for a set of basic symbols, including traffic signs. This would probably reduce the number of misunderstandings and accidents in the traffic.

Conclusions

This paper supports the assumptions noted in the introduction. We may conclude that:

1. A specific message may be communicated to the receiver/s or interpreter/s with several different symbols.
2. A specific symbol may be used to communicate several different messages.
3. People have to learn the meaning of all important symbols within their own society.

The first two points may also be visually represented in the following two schematic pictures (Figure 5, and Figure 6):

Figure 5

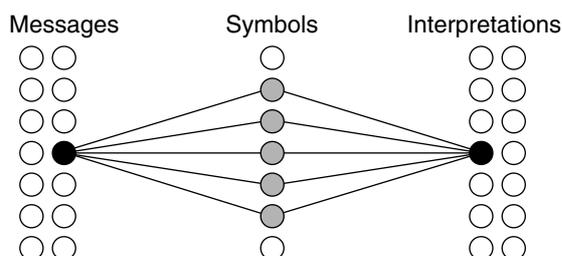
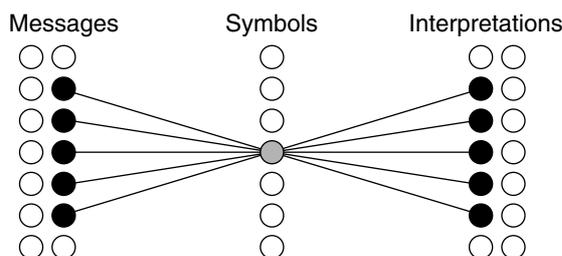


Figure 6



With respect to the design and the use of symbols it may further be concluded that:

4. Receivers may interpret symbols in many ways.
 - Few people share the same understanding of any given symbol.
 - People can usually not guess the meaning of symbols.

- There are strong cultural differences in interpreting the meanings of symbols.
5. The senders will always have to supply explanations for symbols.
 - Symbols should be used in a consistent way.
 - A symbol must always have the same meaning within a specified context.
 6. A good symbol is designed so it can be used in many different situations and in many contexts. A good symbol:
 - is simple and clear
 - has optimal size and good contrast in form, dimension, and colour
 7. Graphical symbols may be intended to convey generalities of the same order of abstractness as verbal terms. In some cases we can see graphical symbols as visual terms. Graphical symbols may be used to:
 - create an overview
 - identify information
 - illustrate position
 - illustrate size relationships
 - navigate in databases
 - provide a holistic perspective
 - recognize information
 - represent an organization, a service, or a product
 - supply information
 - supply instructions

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