# Evaluation of Symbols for Safety Behaviors

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**Abstract**: There are many situations in which an individual may need to be warned of some hazard.  There is a symbol that is universal in connoting that one should not perform certain acts which is represented by a red circle with a slash over the act. However, there is not any universal symbol that indicates what one needs to do in the situation where some hazard exists.  The current study was an attempt to evaluate a symbol that could be used more or less universally in describing behavior which would need to be done under some particular hazardous circumstance. The symbol chosen as a potential basis for presenting such information was a green pentagon which would include within it the act or actions needed to be taken. Thirty-five undergraduate students at the University of Georgia rated a symbol of this sort to provide information versus information without any indicant as a solution to the problem. In six of seven instances the rating of usefulness of the information presented in the pentagon was superior to that presented without the pentagon. The results were discussed in comparison with other possible approaches and suggested that although the evidence was strong here, it might be worthwhile to compare the pentagon with other symbols for indicating what should be done.

*Keywords:* hazard recognition, safety behavior, symbols

## 1. Introduction

Because there are numerous situations in which hazards may occur that may require some action to avoid injury to the individual or to some object of value, it is important to provide information that will enable the injury to be avoided.  An important feature of safety is the communication of what needs to be done in particular situations.  Unfortunately, in many cases there may be no warning, or the warning may not be located in a place where it may be readily seen.  Further, some warnings may be phrased in such a fashion (or language) that may be misunderstood by many observers (Cf. Leonard and Lautenschlager, 2016).  In addition to the failure to provide warnings, some persons may not understand warnings written in a language with which they are not familiar.  There are some symbols that are universally used and understood without words.  A circle containing a symbolic representation of some act with a slash over the act is universally understood to indicate the act must not be performed. However, there is no generally accepted symbol that indicates an act should be performed. There are many individual symbolic representations of acts to be performed or avoided which are pertinent to one or a few situations but the symbols used to present the information are unique to a particular situation.  The present study has attempted to evaluate the feasibility of producing such a symbol to indicate what needs to be done in various situations shown by the symbol.

There are many symbols that are used to direct behavior; none of them have the general sort of meaning such as is found with the circle and slash.  The present study is an attempt to evaluate the usefulness of a particular geometric figure, the pentagon, as an indicator that some act must be performed.  The pentagon was chosen because it has an open area for depicting the action or adverse behavior which may direct the individual to a location where an action should be performed, such as a stairwell when the elevator is not to be used.

## 2. Methods

### 2.1 Participants

A total of thirty-four undergraduate students at the University of Georgia participated in a survey of various uses of the pentagon to indicate an action to be taken.

### 2.2. Materials

The general shape of the pentagon used in this experiment is shown in Figure 1. A preliminary test was made of three identical items such as shown in Figure 1 with three different colors involved. The three colored pentagons were shown to each participant, but the order of the colors was arranged in six sets of different positions for the colors in order to equalize the effect of a position and avoid demand characteristic.

Figure 1. Representation of Preliminary Symbols Used

The primary test materials consisted of six pairs of items showing a problem and a solution. In each pair, one of the solutions was incorporated into a pentagon, while the other possible solution was not. The basic problem involved in each pair is presented in Table 1, showing the results of those presentations.

Prior to the presentations of the pairs of items a set of three items involving a particular item in each of three pentagons colored green, yellow, and red. The participants were asked to indicate which color they thought best for the "to do" symbol. Each of the six possible orders of the colors was presented to one sixth of the participants in order to avoid any demand characteristic for color selection. Inasmuch as 33 of 35 participants selected green as the appropriate color, the color green was used for the pentagons used in presenting the appropriate behavior.

## 3. Results

As may be seen in Table 1, the mean ratings for items using the pentagon were greater for each pair relating to a particular problem. The mean ratings for the items including the pentagon were higher for all pairs. As seen in Table 1, the ratings of usefulness for those items including the pentagon were higher in all cases. And in general, the standard deviations were lower which indicates a positive effect of the pentagon.

Table 1. Ratings of Presentation Forms

| Symbols | With Pentagon | | Without Pentagon | |
|---|---|---|---|---|
| | Mean | SD | Mean | SD |
| Stairs/Not Elevator | 3.94 | 1.49 | 2.97 | 1.37 |
| No Smoking | 3.17 | 2.24 | 2.76 | 2.10 |
| Keyboard Posture | 3.08 | 1.83 | 3.50 | 1.33 |
| Ear Protection | 4.41 | 1.63 | 2.79 | 1.03 |
| Face Mask | 4.41 | 0.52 | 2.76 | 1.12 |
| Need for Washing Hands | 4.03 | 1.24 | 3.00 | 1.37 |

## 4. Discussion

The present study has shown that information about desirable activity can be acceptable when presented in the form of pictorial presentation within a pentagon with green borders. The use of the pentagon was chosen because it has a good open space in which to display the activity to be performed and the vertex provides a location for a pointer which serves as an arrow to indicate where the action might be taken. There may be other formats that could have similar capabilities. Our concern was to show how feasible a format that could have universal usage could be. We are aware that symbols using other colors have

been introduced in some cases with relationship to what could be a hazard. For example, Braun, Sansing, Kennedy and Silver have examined different forms of warnings, including various colors. We chose the color green because many of the individuals with whom the study was discussed prior to the actual procedures suggested green as indicating the safe sort of action and this was verified by the responses to the figures represented by Figure 1.

It must be recognized that the procedure which involved a symbol for all of the items could have somewhat of a demand characteristic because all of the participants were aware that they were evaluating that particular procedure and would recognize it to be a desired sort of condition. However, it is also important to recognize that if one wishes to have a general form for actions to be performed, this is a reasonable approach. There may be a number of other possible approaches that are general, but at this time there is no evidence for any of the others because they have not been examined. Clearly, additional research would be useful in making comparisons between the present design and others that might have some generality, and, therefore, we have a basis for experimentation using comparison items to evaluate other possibilities.

## 5. References

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