

Attributions of female college students to variations in pupil size

NANCY TOMLINSON, ROBERT A. HICKS, and ROBERT J. PELLEGRINI
San Jose State University, San Jose, California 95192

Ratings were obtained from 246 female college students to the full-face photographs of a male and female peer. For each model, the photographs had been retouched to provide a continuum of pupil sizes (i.e., small, moderately large, and large). Consistent with a limited literature, a significant inverse linear trend was observed between pupil size and the positiveness of the like-sex ratings. The relationship between pupil size and the positiveness of the cross-sex ratings was an unanticipated inverted U-shaped curve. The significance of these data for the pupil size/nonverbal communication literature was discussed.

As a consequence of recent reviews of the pupillometric literature, Hess (1975b) and Janisse (1977) have reached dissimilar conclusions concerning the role of pupil size in nonverbal communication. Largely on the basis of his own research (also see Hess, 1975a, and Hess & Goodwin, 1974, for reviews), Hess has concluded that pupil size is important in nonverbal communication in that it appears to act as an innate releaser for certain prosocial behaviors (e.g., sexual interest). In contrast, Janisse concluded that, at best, pupil size is a trivial variable in the nonverbal communication process.

Perhaps the most striking feature of these conclusions is that they are based on what can charitably be described as a weak and very limited data base. At this time, it seems premature to classify pupil size as an innate releaser or to dismiss it as a relatively meaningless variable. In fact, a fair bit of research seems to be indicated before any reliable conclusions can be drawn concerning the role of pupil size in the nonverbal communication process. For example, not one study has been published that measured affective responses to more than two pupil sizes. That is, the relationship between a continuum of pupil sizes and affective ratings has yet to be established.

The purpose of this research was to measure the attributions of female college students to photographs of a male and a female peer in which the pupils had been retouched to provide a 3-point continuum of pupil size. We selected females as subjects because limited previous research has shown that women tend to rate increases in pupil size in photos of men and women in opposite directions, that is, more positively for men and less positively for women (see Hess & Goodwin, 1974). Since these relationships between like- and cross-sexed stimulus persons has not been

as clearly established (or as adequately studied) in men, it was thought that the responses of a sample of women would provide the most sensitive first test of the relationship in question.

METHOD

Subjects

A group of 246 female college students, who were enrolled in classes that were primarily of interest to women, were the subjects for this study. These subjects were tested in groups during the class periods.

Materials and Procedure

The photographs of the male and female stimulus persons were selected in the following manner. First, from a commercial photographer, we obtained a large number of full-face photos of persons who appeared to fall within the age range that is typical of most college undergraduates. From this group, we selected the photos of 10 males and 10 females that seemed to us to be moderately attractive. Next, a 35-mm slide of each photograph was prepared. These slides were shown to a group of 35 judges, who rated each photograph for attractiveness on a 7-point graphic scale. The male and female photographs that were rated nearest the midpoint of the scale with the least variance were selected as the stimulus persons. Next, each of these photos was retouched so that, for each person, three identical photos were created, that varied only in pupil size. The area of the iris covered by the small, moderately large (medium), and large pupils were 6%, 29%, and 46%, respectively. Finally, for each of the resulting six photographs, a 35-mm slide was prepared, and these slides were shown to our subjects.

The rating scales used were identical with those used by Hicks, Reaney, and Hill (1967) in a similar study. Essentially, these were two 5-point graphic scales that were bounded by sets of bipolar adjectives (i.e., pleasant-unpleasant and warm-cold).

The subjects were handed six sets of rating scales and then were asked to rate each photograph on both of the 5-point scales as these were projected onto a screen in the front of the room. Each slide was projected for a 30-sec period, and a 30-sec interslide interval was used. The order of presentation was randomized for each group of subjects.

To obtain a score for each person for each slide, that person's two ratings for a given slide were summed, and thus six scores were derived for each subject.

Reprint requests should be addressed to Robert A. Hicks, Department of Psychology, San Jose State University, San Jose, California 95192.

Table 1
Means and Standard Deviations of the Summed Ratings
for the Six Photographs

Sex of Model	Pupil Size					
	Small		Medium		Large	
	Mean	SD	Mean	SD	Mean	SD
Female	7.7	1.7	7.2	2.0	6.8	2.0
Male	5.4	2.1	5.9	1.9	5.2	2.0

RESULTS AND DISCUSSION

The summed rating data for each stimulus person by pupil size photograph are summarized in Table 1.

First, these data were analyzed using a 2 by 3 factorial ANOVA for repeated measures. The results of this ANOVA revealed significant main effects for both sex of model [$F(1,490) = 162.9$, $p < .001$] and pupil size [$F(2,980) = 16.05$, $p < .001$]. Further, the Sex of Model by Pupil Size interaction was also significant [$F(2,980) = 11.58$, $p < .001$].

The significant main effect for sex of model was unexpected, since we had thought that we had equated these photographs for attractiveness during the pre-experimental procedures used in selecting the final two stimulus persons. Apparently, when given a two-choice option, as was the case here, subjects will select one as more attractive, and this will be reflected in the overall mean ratings.

Both the significant pupil size main effect and the Sex of Model by Pupil Size interaction were anticipated. However, the differences in the pattern of the female and male pupil size mean do not conform to the inverse and direct relationships for like- and cross-sex ratings that were mentioned earlier. To further elaborate the functions indicated by the sets of means given in Table 1, trend analyses were computed from the male and female model data. This analysis of the female model data revealed a significant linear trend [$F(1,490) = 26.83$, $p < .001$]. As a result of a separate analysis of the male model data, a significant quadratic trend was obtained [$F(1,490) = 25.10$, $p < .001$]. The linear trend observed when females rate pupil sizes

in other females lends reliability to the results of an earlier study (i.e., Hicks et al., 1967) that observed a similar trend using only two pupil sizes. The significant inverted U-shaped trend that characterized the cross-sexed ratings obtained in this study may help to clarify inconsistencies in the literature. As Janisse's (1977) recent review carefully documents, the few studies that have considered cross-sex responsiveness to a small-large pupil dichotomy reported either a direct relationship between pupil size and positiveness of response or no relationship at all. Given the reliability of our data, then, either of these results could be obtained with a dichotomous manipulation of pupil size, depending, of course, on the size of the large pupil used. However, since previous studies have failed to report the percent of iris covered by the pupils used, we cannot determine the validity of this possibility.

Finally, we wish to point out certain reservations we have concerning the generalizability of these findings. We did not use male subjects for the reasons given earlier. Clearly, the relationships we have reported here may only apply to females. Further, as mentioned, we were surprised by the significant (and substantial) main effect for sex of model. Although we have rationalized this as an artifact of the procedure used, this may not be the case at all. Perhaps, the functions we have observed here were not the result of cross- and like-sex ratings but, rather, were primarily the result of rating relatively more attractive and less attractive models. We are currently testing for this possibility.

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