

Golden section: Preferred figural orientation¹

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A hypothesis that the shape of the binocular visual field determines the supposed preference for rectangles possessing dimensions similar to those of the golden section was tested by having Ss draw pleasing rectangles. The results indicated that rectangles were oriented in correspondence with the shape of the visual field but there was, generally, a failure to obtain ratios approximating the golden section.

A hypothesis has recently been advanced to explain the supposed preference for rectangles whose dimensions are approximations of the golden section (Stone & Collins, 1965).² It is a perimetric hypothesis in that it is based on the relation of the area of binocular visual field to a rectangle possessing dimensions of the golden section. Briefly, the authors of the hypothesis found that an "average rectangle" of rectangles drawn within and around a chart of the binocular visual field possesses 90% of the area within the outline of the binocular field and is a rectangle whose ratio of length to width is .665 (Ruch, 1960). It is significant to the present discussion that the average rectangle is also horizontally oriented with respect to the long side. The authors assume that it is the correspondence between the dimensions of the binocular visual field and the golden section that accounts for the preference for the latter in figural displays.

However, under the same assumption, another preference should also be shown, namely, a preference for horizontally, rather than vertically oriented rectangles; that is, if a preference for a particular ratio of long to short side is determined by visual field dimensions, then the orientation of the figure should also coincide with the field's horizontal orientation. This study was performed to test this implication and to verify the existence of a preference for the golden section in a situation in which Ss construct their own figures.

Method

Thirty-six volunteers from an introductory course in psychology served as Ss. The Ss were presented with square white sheets of paper, 21.26 cm a side. The Ss were tested in a classroom situation and made their responses at their desks. The instructions were to "draw the most aesthetically pleasing rectangle that you can on the sheet of paper." After completion, the Ss were instructed to orient the figure (either horizontally or vertically, with respect to the long side) in the most

pleasing position. This latter procedure was instituted to insure that preferred orientation was not due only to ease in drawing either horizontal or vertical lines.

Results

As anticipated, a wide majority, 35 out of the 36 Ss (97%), oriented their rectangle horizontally with respect to the long side. On the other hand, the average ratio of smaller to larger side was .525, with a standard deviation of .104, a median of about .500, and a modal value between .459 and .560.

Discussion

The overwhelming preference for a horizontal orientation of the drawn rectangle is consistent with a consideration of a figural preference based on the shape of the binocular visual field. This finding is also consonant with a map of the binocular field during a short-time search, an ovaloid with the long axis horizontal to the viewer's orientation (Chaikin, Corbin, & Volkman, 1962). However, the results pertaining to the obtained ratios call into question the existence of a preference for the golden section. Documentation for the supposed figural preference is fragmentary. Some early investigators also obtained results which question a preferred geometric proportion in rectangles (Davis, 1933; Ogden, 1937).

A number of alternative considerations may explain the failure to obtain ratios approximating the golden section; for example: (1) the metric properties of the golden section may form a ratio having no reference to figural preferences; (2) the golden section may be manifested when viewers are allowed to choose the most pleasing rectangle among rectangles varying in ratios of length to width; this latter explanation assumes a distinction between drafting and choosing a rectangle; (3) if the perimetric hypothesis is valid, i.e., figural preferences are associated with the visual field, then the dimensions of a rectangular fit of the binocular field of American university students may be different from the dimensions specified by the golden section.³

The results complement a perimetric explanation of a preference in figural orientation but question whether a unique geometric proportion is also preferred on the same basis. The findings do not necessarily delimit the perimetric hypothesis but they do suggest that other measures of the binocular visual field should be examined.

References

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Notes

1. This research was aided by a grant from the Rutgers Research Council of Rutgers, The State University.
2. The golden section refers to the geometric proportion, $1:X=X:1-X$ or the whole is to the larger part as the larger part is to the smaller. A rectangle which possesses dimensions similar to the golden mean requires that the shorter side be about 0.618 of the larger.
3. It has been suggested that facial features may account for some of the variability of rectangle preference; see, for example, R. S. Woodworth.

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