

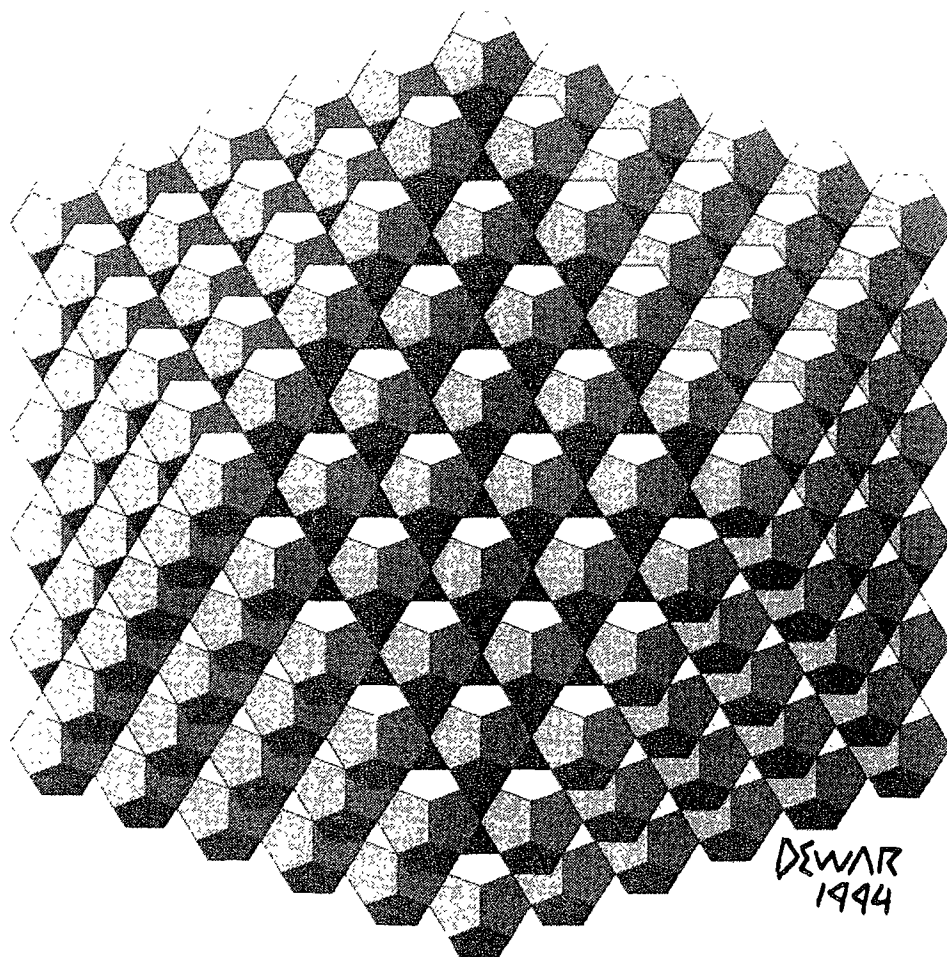
# Symmetry: Culture and Science

Symmetry:  
Natural and Artificial, 2

The Quarterly of the  
International Society for the  
Interdisciplinary Study of Symmetry  
(ISIS-Symmetry)

Editors:  
György Darvas and Dénes Nagy

Volume 6, Number 2, 1995



Third Interdisciplinary Symmetry Congress and Exhibition  
Washington, D.C., U.S.A. August 14 - 20, 1995

SYMMETRY AND CREATIVITY: INDIVIDUAL DIFFERENCES  
IN PREFERENCE AND DRAWINGS

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Three studies of preference for symmetry in patterns and drawings by children and adults will be reported. Symmetry seems to be at the heart of many notions of visual and other kinds of structure. Saint-Martin (1990a,b) for example, has studied the semiotics of various visual art in terms of Gestalt principles, including symmetry. Symmetry in art has also been studied extensively by Arnheim (1974) and more recently Leyton (1993), who suggests that an analysis of symmetries is fundamental to the understanding of visual structure. Leyton's work supercedes a long tradition of the study of visual structure in terms of goodness (Attneave, 1954; Garner, 1974) and Lie algebra (Dodwell, 1983; Hoffman and Dodwell, 1985), for example. Even four-month-old infants can discriminate at least bilateral symmetry from asymmetry (Humphrey and Humphrey, 1989) and prefer multiple symmetries to lower amounts of symmetry in dot patterns.

In the first study dot patterns with varying amounts of circular symmetry (types of symmetry used in these studies are derived from Rosen's (1975)

definitions) were shown to 135 children 2 to 12 years of age in forced-choice trials. Preference for asymmetrical patterns decreased with age. Girls were found to have greater preference for patterns with large amounts of symmetry than were boys. Younger boys, however, showed a greater preference for horizontal symmetry, than did older boys and girls of all ages.

A second study looked at preference for symmetry in dot patterns as well as the use of symmetry groups (Rosen, 1975) in drawings done with colored markers by 35 adults and 21 children. Females again showed greater preferences for higher levels of symmetry in dot patterns. Females also showed significantly greater frequencies of basic symmetry groups, such as reflection, translation and rotation, in the details of their drawings. Males, on the other hand, showed the use of, on the average, three times as many strokes of the markers in their drawings, but did not draw more objects.

In the third study 49 female and 15 male undergraduates rated photographic slides of the drawings obtained in the previous study on five-point scales of Creativity, Pleasingness, Complexity, Symmetry in Details and Overall Symmetry. Adults' drawings were rated as more creative, more pleasing, more complex, having more symmetry in detail and more overall symmetry than children's drawings. Females' drawings were rated as more pleasing, and more complex. Males' drawings, however, were rated as having more overall symmetry. Subjects in this

study also rated on the same scales two large murals that had been executed by same-sex groups of 6 children each. The mural painted by the group of girls was rated as more creative, more pleasing, and having more symmetry, both in detail, and overall than the mural painted by the boys' group.

Taken together, these three studies show that females use greater amounts of symmetry in details but greater complexity overall in their individual drawings. Males, on the other hand, seem to show more complexity (in terms of number of strokes used) in the details of their drawings, but greater overall symmetry. Some of these sex differences are sharpened in the context of same-sex groups, perhaps indicating support for a dynamical view of the ontogeny of cognitive sex differences. Furthermore, quantitative analyses of structural variables such as symmetry in drawings reveal individual differences in creative works which are easy to see but difficult to substantiate in empirical studies. Current research involves the study of symmetry in three-dimensional constructions by children, as well as in their drawings under differing environmental conditions.

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