

Circle size judgment by psychophysical scaling

Marcelo Costa, Balász Vince Nagy and Adsson Magalhães

We used the magnitude estimation to obtain the apparent size of circles. Eighty-two subjects with normal or corrected-to-normal visual acuity (mean age= 22yrs; SD= 1.4) were tested. The procedure consisted of two gray circles luminance of 40 cd / m², 10 degrees apart from each other. On the left side was the reference circle (visual angle of 1.1 cpd) in which was assigned an arbitrary value of 50. The subjects' task was to judge the size of the circles appearing in the right side of the monitor screen assigning the number proportional to the changed size, relative to the reference circle. Seven different sizes (0.6, 0.8, 1.0, 1.1, 1.3, 1.4, 1.5 cpd at 50 cm) between smaller and larger than the reference circle were presented. Our results have shown a high correlation ($R= 0.9987$) between the logs of the stimuli and the subject response. The exponent obtained was 0.71, which indicates that for the judged apparent size of the circle to be 2 times larger or smaller than the reference, we need a change of 3 times of the physical size. In conclusion, we found a non-linear judgment in the apparent size of gray circles in a visually normal population of young adults.