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MEMORY PSYCHOPHYSICS FOR AREA: EFFECT OF LENGTH OF DELAY[1]

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Summary.—For groups of 10 subjects magnitude estimation of area presented physically or symbolically (using prelearned CVCs) could be described by power functions. Memorial judgments were also governed by power functions, but shallower ones. These relations held regardless of length of delay of the memory-based judgment.

Memory psychophysics, or mnemophysics, is the branch of psychophysics that explicates the functional relations between physical stimuli and their remembered sensory properties. Typically (e.g., 1, 2) in a first learning session, the to-be-judged stimuli are associated with unordered codes (such as colors or CVCs); then, at a second session, subjects make quantitative judgments of the original stimuli represented symbolically by their prelearned codes. The time intervals between learning and memory-based magnitude judgment used in mnemophysical research have been fairly limited. The present investigation included four delays, ranging from responding immediately after learning the symbolic codes to 24 hr. To control for the effects of familiarity and time delay, the study also included three perceptual conditions: judgments of *physically* presented stimuli either without previous associative learning or with immediate or delayed (by 24 hr.) associative learning.

The stimuli were discriminatively different circular areas (diameters of 1, 2, 4, 8, and 16 cm.). For each delay, separate groups of subjects (10 in each condition) made magnitude estimations of area either presented physically (perceptual conditions) or represented symbolically via prelearned CVCs (memorial conditions).

Results of the three perceptual groups could be described by power functions with exponents of 0.68, 0.66, and 0.68 (r^2s were .998, .997, and .994, respectively). Importantly, memorial judgments were also governed by power functions, but with smaller exponents: 0.42 ($r^2 = .996$), 0.49 ($r^2 = .998$), 0.50 ($r^2 = .997$), and 0.45 ($r^2 = .994$) for delays of 0, 10 min., 180 min., and 24 hr., respectively. These results imply that, within the span tested, the magnitude of delay does not materially influence memory-based judgments of visual area. Regardless of the length of delay, the memorial exponents roughly equalled the squared perceptual exponents (familiarity with the stimulus making little difference), lending support to the reperceived account (1, 2) of remembered magnitude.

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