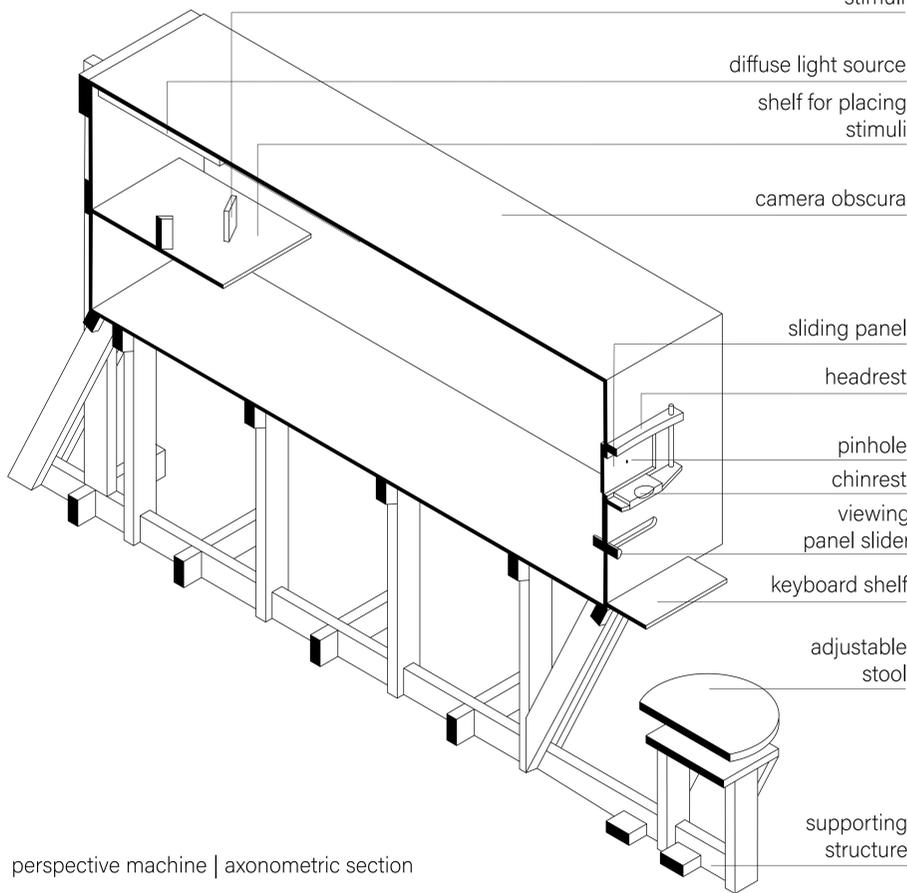
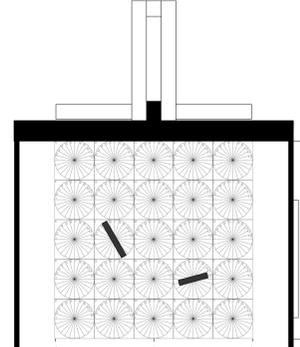
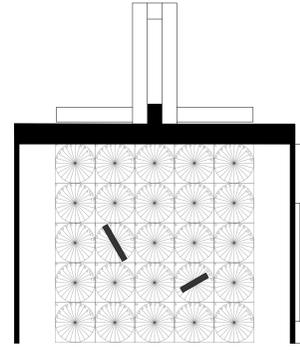
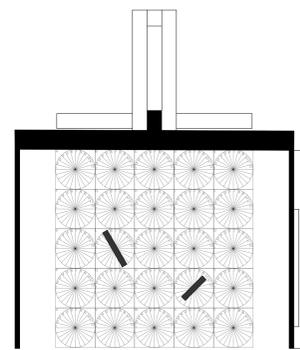
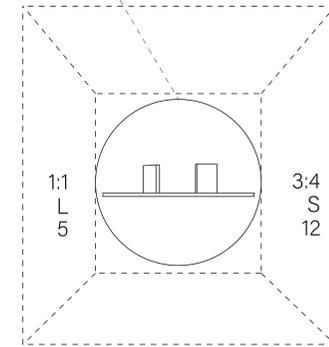
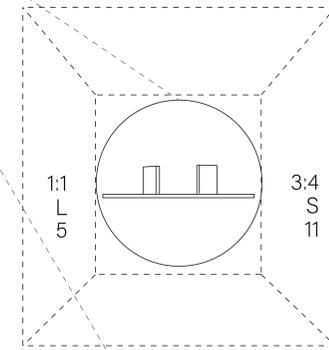
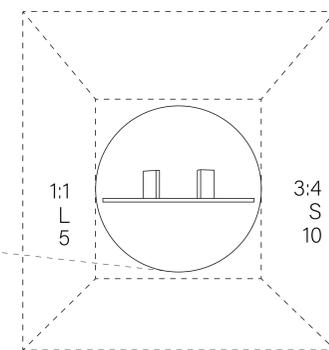


perspective machine | perspective view



perspective machine | axonometric section



The morphotheek is a set of proportioned objects designed by Hans van der Laan. It contains 120 parts (60 “blocks,” 20 “bars,” 20 “slabs,” and 20 “white forms”). When assembled, it has the shape of an eight-layer pyramid built after Van der Laan’s plastic number system. The first layer can be used as a self-contained educational tool called the “triangle of forms” (10 blocks, 10 bars, 10 slabs, and 6 white forms).

The “perspective machine” is a measurement platform designed to study the perception of proportion in three-dimensional volumes under perspective distortion. It is a version of camera obscura elevated above the ground by a supporting frame. Inside, it has a 50x50 cm horizontal shelf marked with a 5x5 square grid. The grid is composed by 25 locations named with letters (A to Y). Each location is marked by a circle with 11 different orientations, each increasing of 15 degrees and named with a number (1 to 11). The stimuli (here, morphotheek pieces) are placed on the shelf. A diffused light is mounted above the shelf. The subject is seated on the adjustable stool, shown at the right. The device allows for both monocular and binocular viewing using a replaceable sliding panel.

The experiment. Human subjects view pairs of solid objects sampled from the morphotheek, presented in pairs monocularly (through a pinhole) or binocularly (free viewing). On each trial, the experimenter places two blocks in the nodes of the 7x7 grid, while the subject view is blocked. At every node, the stimulus object can be positioned at one of 11 orientations. Object identity, location, and orientation are sampled randomly across trials, using a carefully selected subset of the morphotheek. The task is to compare aspect ratios of the stimuli in a protocol of two-alternative forced choice.

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Appraising the role of architectural proportion from a psychophysical perspective

Abstract: The theory of architectural proportion has a long and tangled history in which the definition of proportion emerged as elusive and controversial. Three approaches dominated research of proportion: aesthetic, perceptual-cognitive, and symbolic. The first two approaches are often conflated, implying that proportion is significant mainly for the experience of aesthetic pleasure. We ask whether proportion could play other roles, facilitating perception of the structure and affordances of the built environment. We attack this controversy in an interdisciplinary program of research inspired by work of the architect Hans van der Laan (1904-1991). Van der Laan developed a proportional system centered on the concept of “plastic number” and studied just-perceptible differences between proportions. We pursue these issues using methods of sensory psychophysics. We begin by performing psychophysical experiments into the human ability to discriminate proportions of three-dimensional objects and volumes across distances and spatial scales (called “types of size” by Van der Laan). We begin performing our experiments using Van der Laan’s morphotheek and a visual device designed to display two solid volumes at a time on a 7x7 grid of circles featured with different angulations. This way, we determine the threshold of discrimination between proportions under the conditions of perspective distortion.

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