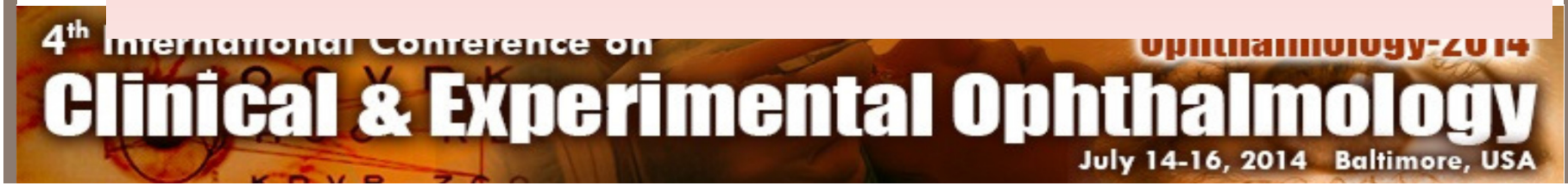
About OMICS Group

OMICS Group International is an amalgamation of Open Access publications and worldwide international science conferences and events. Established in the year 2007 with the sole aim of making the information on Sciences and technology 'Open Access', OMICS Group publishes 400 online open access scholarly journals in all aspects of Science, Engineering, Management and Technology journals. OMICS Group has been instrumental in taking the knowledge on Science & technology to the doorsteps of ordinary men and women. Research Scholars, Students, Libraries, Educational Institutions, Research centers and the industry are main stakeholders that benefitted greatly from this knowledge dissemination. OMICS Group also organizes 300 International conferences annually across the globe, where knowledge transfer takes place through debates, round table discussions, poster presentations, workshops, symposia and exhibitions.

About OMICS Group conferences

OMICS Group International is a pioneer and leading science event organizer, which publishes around 400 open access journals and conducts over 300 Medical, Clinical, Engineering, Life Sciences, Phrama scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.



4th International Conference on
Clinical & Experimental Ophthalmology
Ophthalmology-2014
July 14-16, 2014 Baltimore, USA

DOES SEEING IN VIEWPOINT PERSPECTIVE REQUIRE AWARENESS?

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CHRIS LANGE-KUETTNER, LONDON METROPOLITAN UNIVERSITY

Overview

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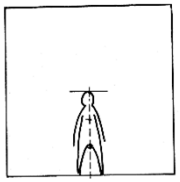
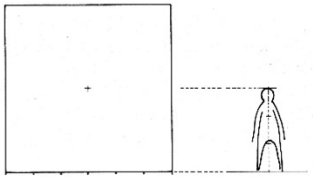
PERSPECTIVE WITHOUT AND WITH A 3D MODEL

7 Drawing in 3D on paper without a model
The Generation of a Space System without Figures

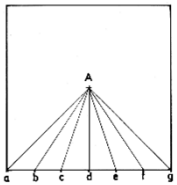
Alberti (1435-36) *Della Pittura*



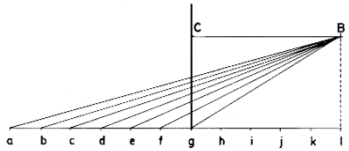
(A) Take a human figure of arbitrary height to determine the viewpoint



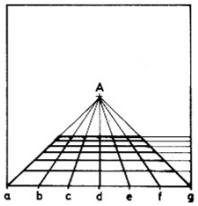
(B) Remove the figure out of the picture



(C) Draw lines from the viewpoint to various distribution points in the foreground

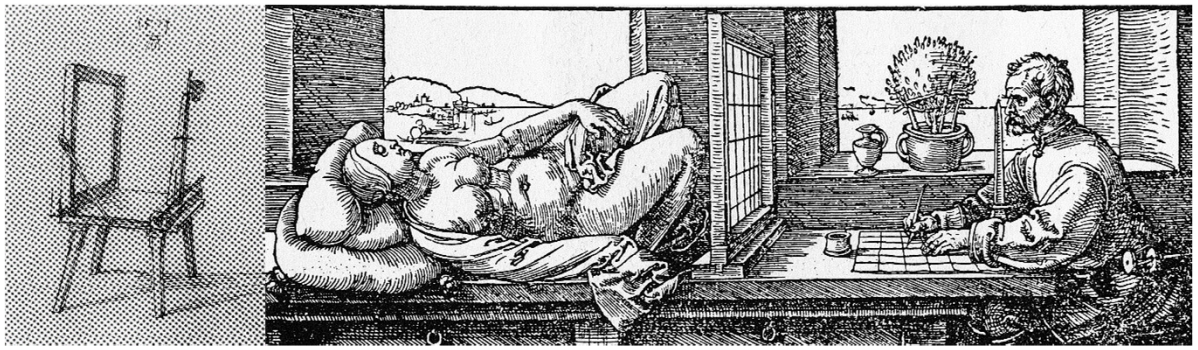


(D) Determine the height of the parallel horizontals by adding another viewpoint



(E) In this way I find all possible trapezoids from which my viewpoint area is composed

8 Perspective Drawing from a 3D Model



Albrecht Dürer, 1525

- When drawing from a real model, the figure cannot be removed from sight
- Instead a ready-made spatial frame is used to separate the spatial system and the figure, for instance with a grid (Dürer, 1525)
- Perspective is then ‚mapped' onto the frame rather than constructed**,** e.g. each square in the grid is filled with **the directly perceived** colours

9 Seeing Visual Size Illusions – The Ames Room

Interactive Relation between Space and Figure Size

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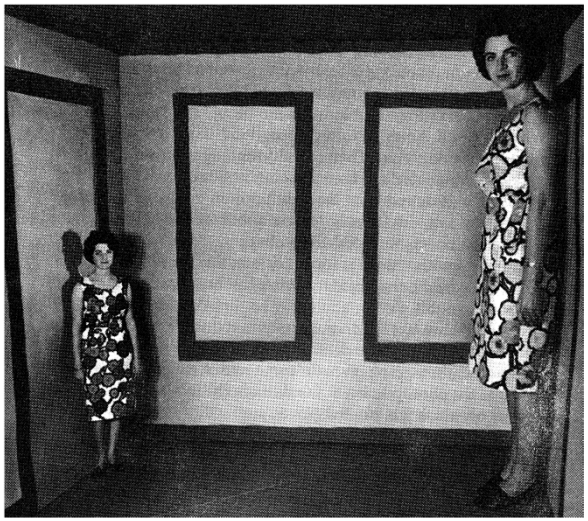

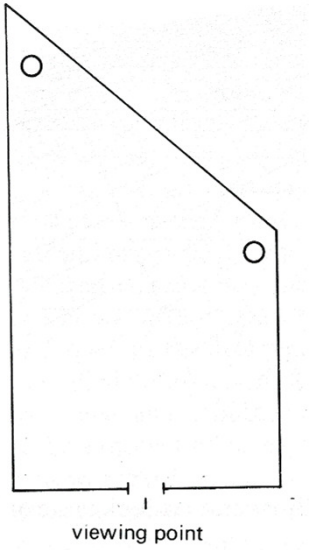

(Gregory, 1966/1990, pp. 178)

- The diagonal axis at the back of the room (floor plan on the right) is not known to the observer who was only allowed to view the figures inside the Ames room with one eye via a peephole.
- Although the room is seen as normal due to habitual viewing expectations, the perception of figure size is distorted (photograph on the left)

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ADAPTING SIZE IN 2D SPACE SYSTEMS

11 Learning to Adapt Figure Size to Spatial 11 Systems in Drawings

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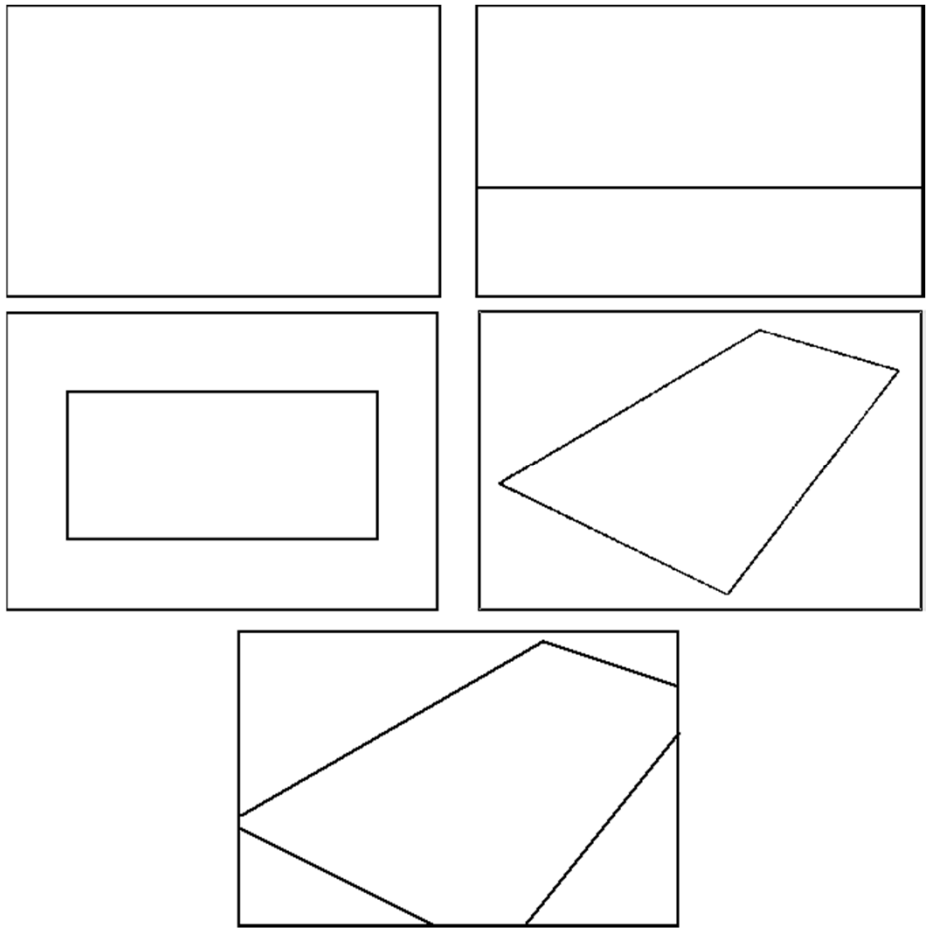
- **2D Drawing Systems with increasing spatial constraints** (Lange-Küttner, 2009)
- Empty Space
- Groundline
- Field
- Closed Perspective
- Open Perspective
- *Children draw five figures into the space systems*



1 Learning to Adapt Figure Size – 2 The Discovery of Spatial Boundaries as Constraints

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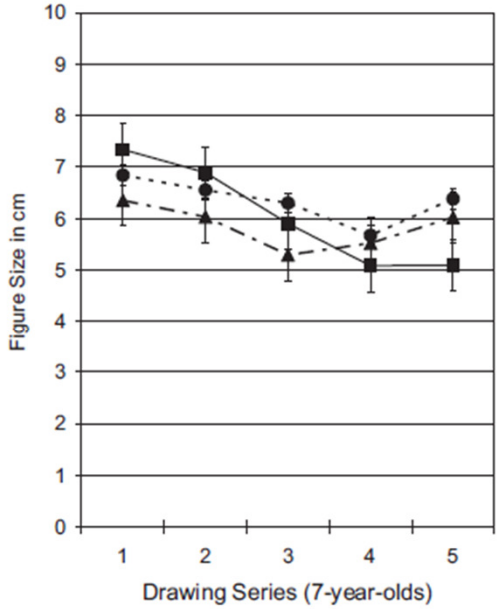
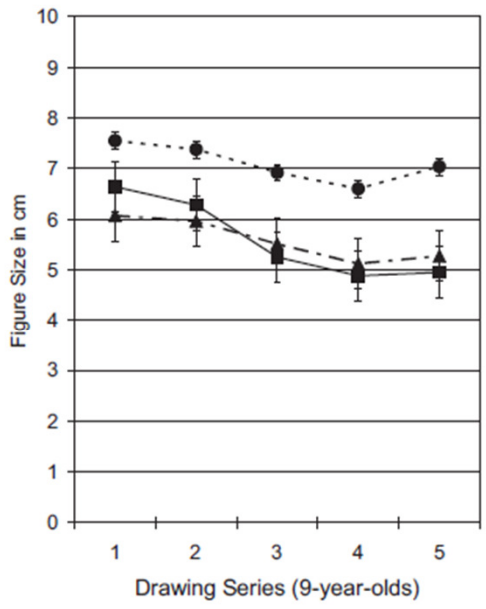
7-year-olds



7-year-olds only draw smaller
if the spatial systems are
in a logical sequence (*pull into 3D*)

9-year-olds



9-year-olds draw always bigger in
the absence of spatial constraints
(practice in empty space)

CHRIS LANGE-KÜTTNER PERSPECTIVE MAPPING

Learning to Adapt Figure Size –
The Discovery of Spatial Boundaries as Constraints

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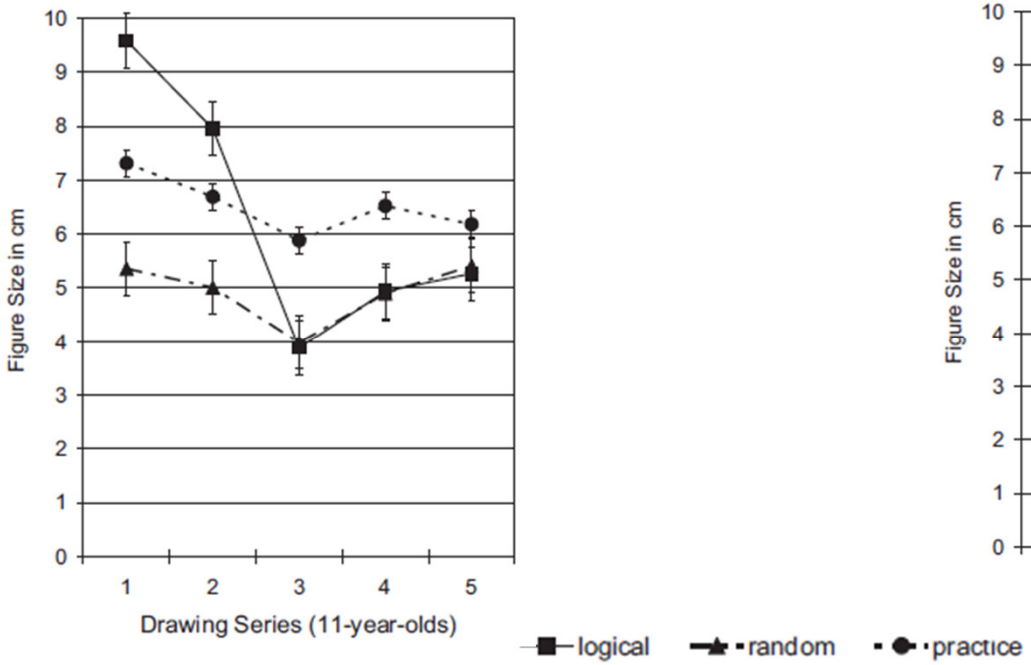
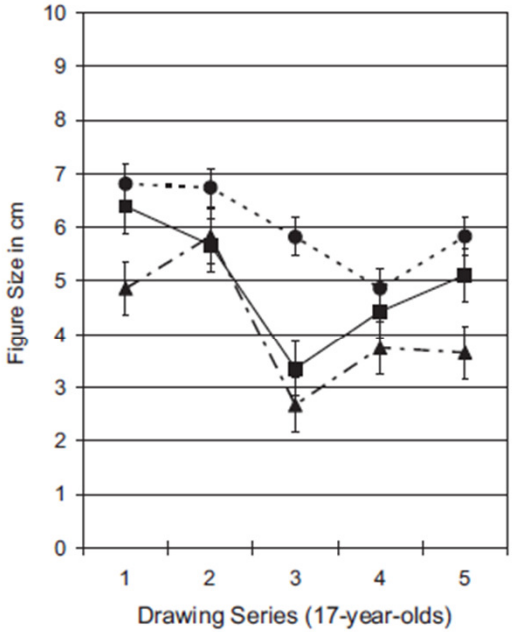
CHRIS LANGE-KÜTTNER PERSPECTIVE MAPPING

11-year-olds



11-year-olds draw large without constraints and small with constraints (*link space system+figure size*)

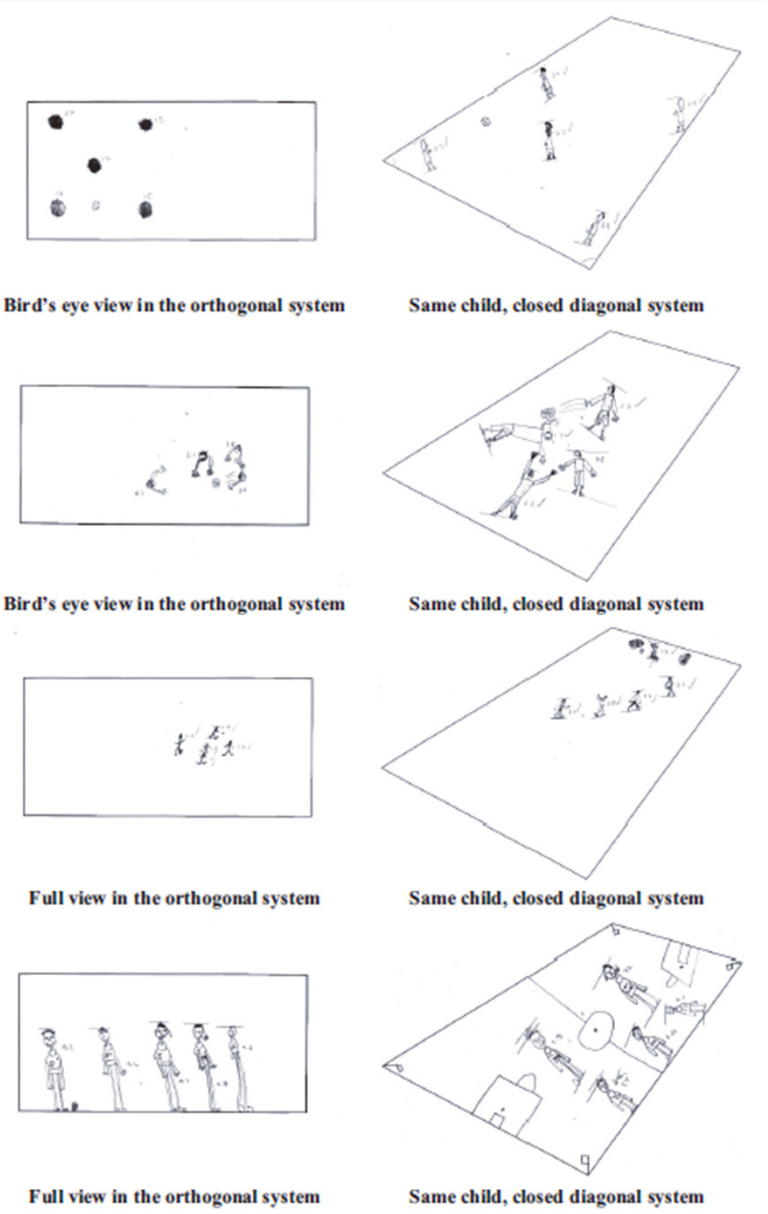
17-year-olds



17-year-olds only draw small in space systems with constraints (*spatial field response*)

14 Examples

- Bird-view drawers are excellent figure size modifiers (rows 1 and 2)
- Very small figures in spatial fields with boundaries (row 3)
- Some 11-year-olds‘ figures are not in proportion (row 4)



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ADAPTING SIZE FROM 3D MODELS

16 Using 3D Models: Empty Space

Model

Floor plan

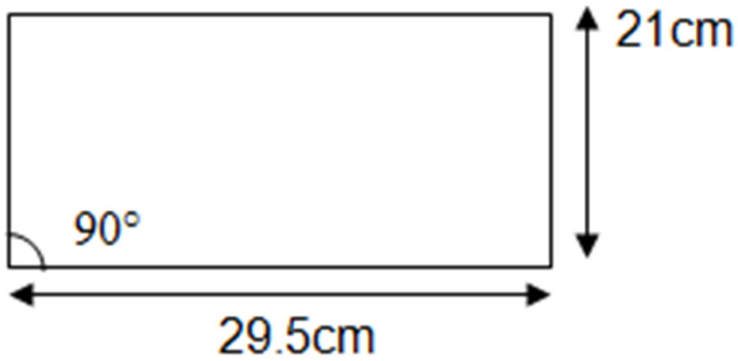


Figure 4 ***Surface space.*** The spatial model resembled the empty space of young children's drawings. The measurements of the platform were the same as of an A4 sheet. No walls or delineated fields would constrain the drawing of figure size.

(Lange-Küttner, 2014)

17 Using 3D Models: Earth Space

Model

Floor plan

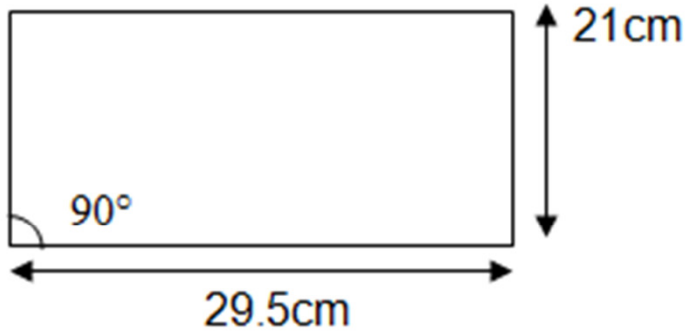
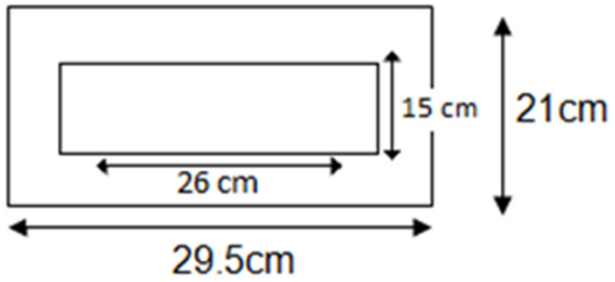


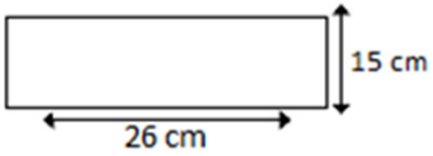
Figure 5 ***Earth space.*** This space model emulates the stripy drawings of children who draw ground line and skyline pictures. Children denote with these stripes two properties of our earth, i.e. they can walk on the ground due to gravity and there is a heaven above us. Again, the floor plan measurements match that of an A4 drawing sheet. The walls on either side were 15 cm high and the sky lid had the same measurements as the ground.

18 Using 3D Models: The Field

Model **Floor plan**



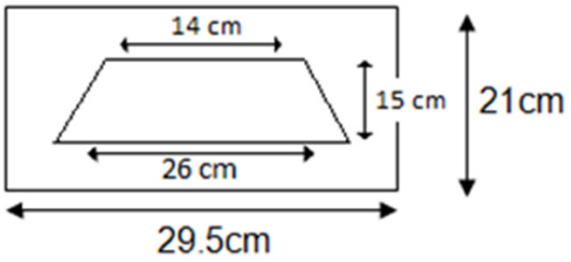
(6A) Ground with Walls and Playing Field with Explicit Borders



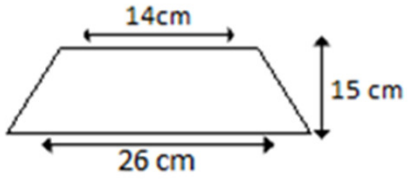
(6B) Ground with Walls as Borders of the Playing Field

19 Using 3D Models: Built-in Perspective

Model **Floor plan**



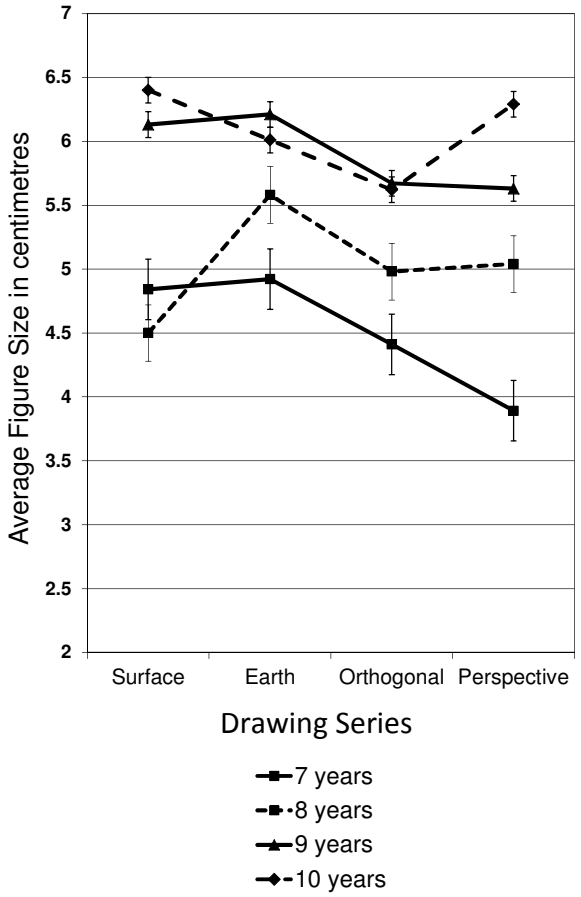
(7A) Ground with Walls and Diagonally Converging Playing Field with Explicit Borders



(7B) Ground with Diagonally Converging Walls as Borders of the Playing Field

20 Learning to Adapt Figure Size to Spatial Systems

- ***7 years:*** *Show the steepest size adaptation !*
- ***8 years:*** Drawing a habitual size
- ***9 years:*** Show a subtle size adaptation
- ***10 years:*** Show a subtle size adaptation (but not in the perspective system)



(Lange-Küttner, 2014)

21 Perspective Mapping

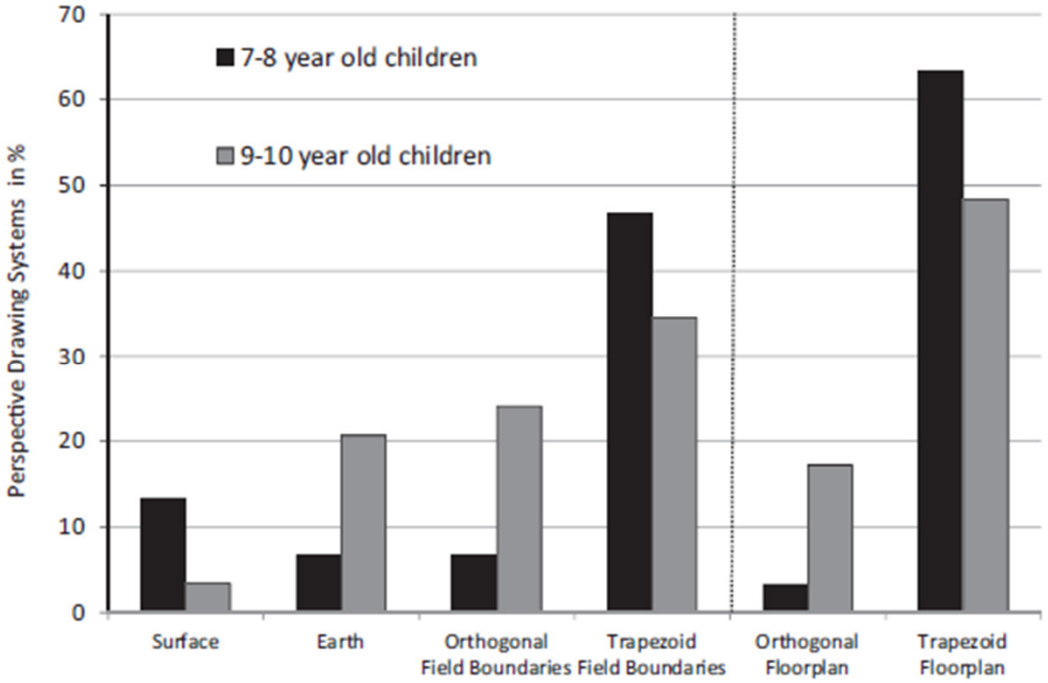


Figure 6. Percentage of perspective drawing systems when using six different 3D spatial models.

7-8 year old children are very likely draw in perspective only when the field has a trapezoid shape

22 Perspective Mapping Examples

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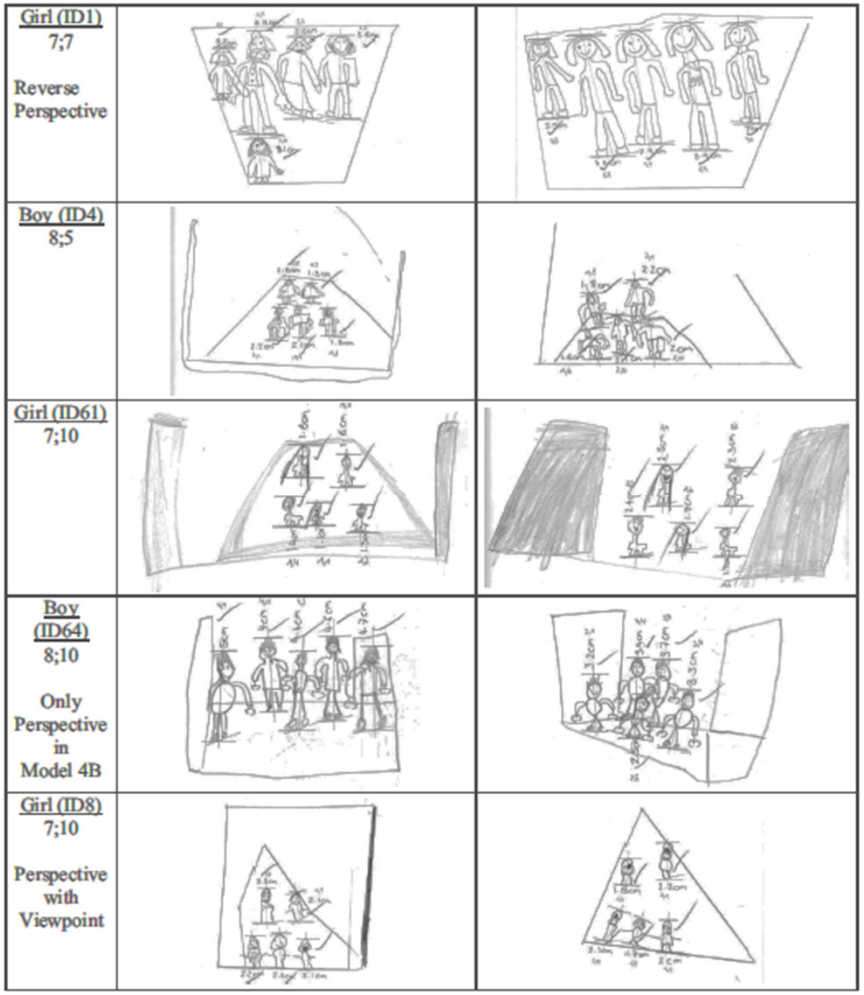
- Examples show perspective mappings of various kinds
- Copies of the floorplan as well as 3D sketches of the entire model



23 Layers of Ability

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- This is the very first study to show that already 7-year-old children can draw in perspective
- The early perspective mapping would have occurred because of the agreement between retinal image (appearance) and design (identity) of the perspective models.
- This shows that children can access low-level visual information (rather than symbolic knowledge) and use it in their drawings
- Rather than a stagewise model of development from symbolic to a visual code, a layered model of ability is suggested (low level-high level vision) like in adults

Thank you very much for your attention.

I am now available on Skype for discussion.

My Skype name is christiane.lange.kuettner

Let us meet again

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We welcome you all to our future conferences of OMICS Group International

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