

# HUMAN PROPORTIONS IN PAINTINGS: LEARNING FROM ALBRECHT DÜRER

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## Introduction

**Albrecht Dürer** (1471-1528), one of the greatest known artists (Fig. 1) of the **Northern European Renaissance**, was influenced by Leonardo da Vinci, Marcus Vitruvius and other significant classic aesthetic painters. He **displayed figures of human body of different shapes and sizes** in order to show their **unique proportions and beauty**.



Figure 1. A self-portrait by the German Renaissance artist **Albrecht Dürer** (1471-1528 CE). c. 1500 CE and four books of human body proportions.

<https://www.worldhistory.org/image/12882/albrecht-durer-self-portrait/>

<https://archive.org/details/hierinnsindbegri00dure/page/8/mode/2up?view=theater>

## Aims of the project

The aims were to **take a special look at the Dürer's figures** and to **describe some anatomical and anthropometrical proportions in paintings**, according to review of the existing literature.

## Materials and methods

**Data** were collected from **several articles** and **scientific publications in English** in the **PubMed, Scopus** and **medical history sources**.

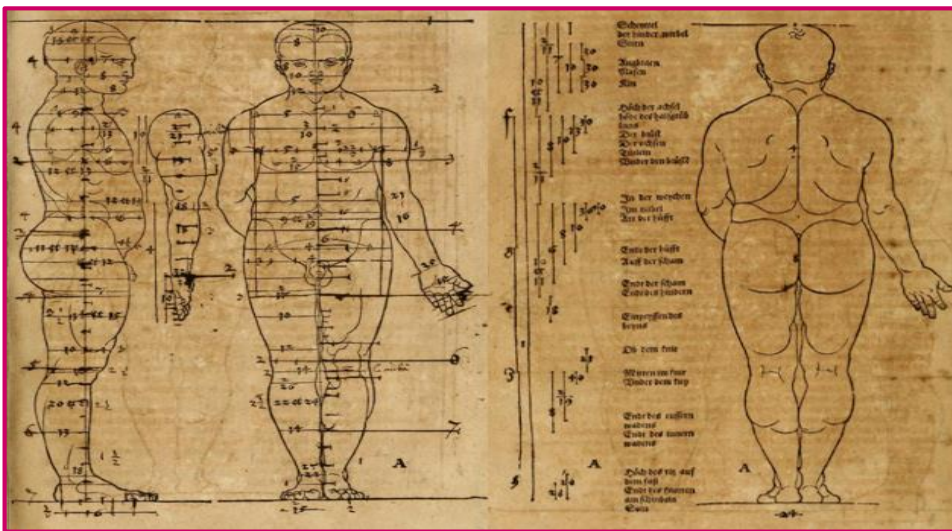


Figure 2. **Albrecht Dürer's Human Proportions**.

<https://archive.org/details/hierinnsindbegri00dure/page/8/mode/2up?view=theater>

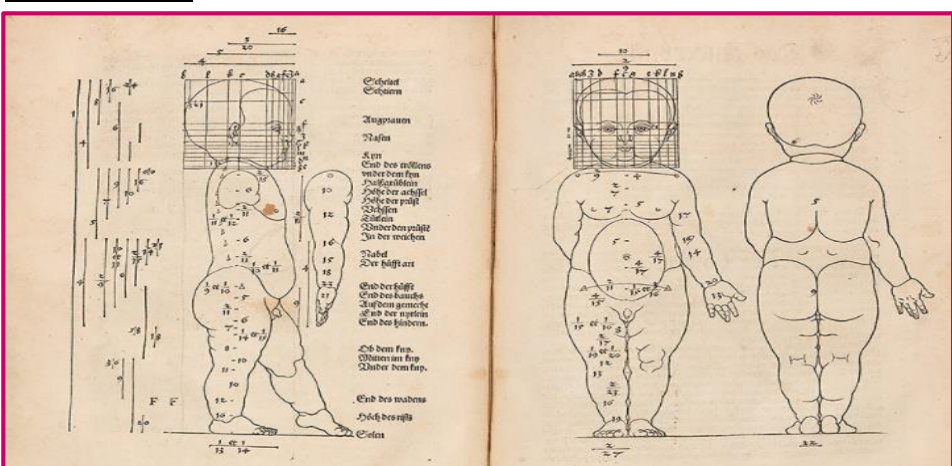


Figure 3. **A young child's drawings, A. Dürer's sketches**.

<https://www.mmbm.ch/duerer-en.html>

## Results

**Four books** ("**Vier Bücher von menschlicher Proportion**", 1528) included **Dürer's findings** of the **different human proportions and physiques** (fat, thin, tall, short, baby, child, adult) (Fig. 1-3).

**Book I** included five differently constructed types of both male and female figures. All parts of the body were expressed in fractions of the total height.

**Book II** explained the use of a measuring stick which measured a sixth of the entire length in the human figure as realistically as possible.

**Book III** adjusted the **proportions using mathematical rules** (including the mathematical simulation of convex and concave mirrors), **with examples of extremely fat and thin bodies**, and demonstrated **proportions changes** in creation of the **variations**. There Dürer also illustrated **human physiognomy**.

**Book IV** showed the **human figure in different movements**.

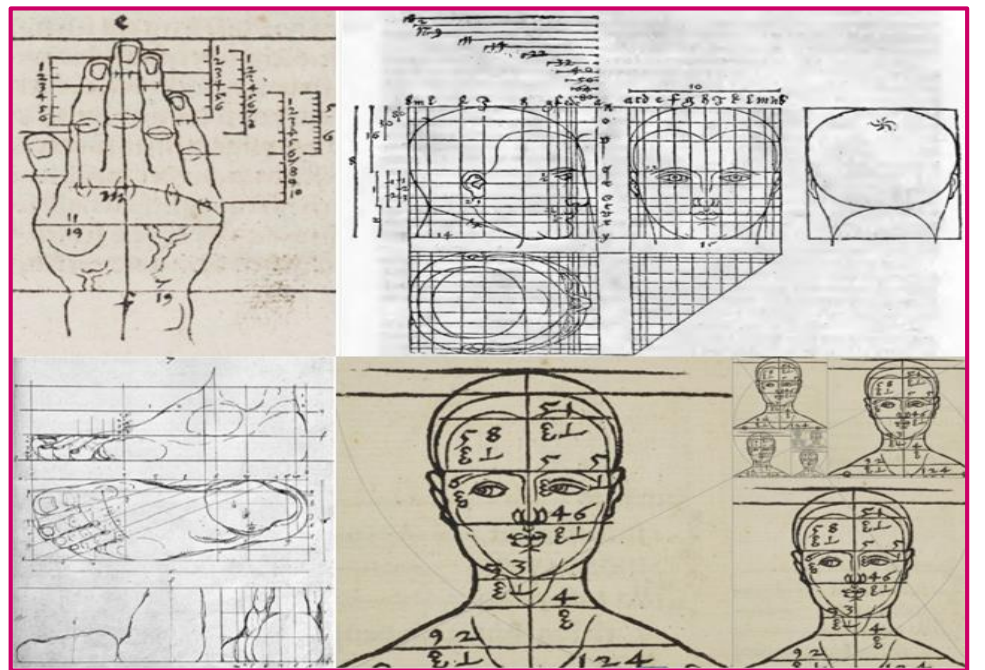


Figure 4. **Proportions and relations of the parts in the body**.  
<https://collections.nlm.nih.gov/catalog/nlm:nlmuid-2233015R-bk>

**All of relations** (fingers to hand, hand to forearm, forearm to arm and all limbs in relation to the length of the body) he **expressed as fractions of total body length**.

Dürer **measured the distances between defined points on the human body** and **divided the body into six equal parts** (mathematical model).

There were **used special geometric techniques and grids** to make more proportional and correctly drawn figures (Fig. 4), **he modified heads and/or faces** and **simplified the human body into several sections using geometric shapes** (spheres, cylinders, cones, cubes, pyramids).

This **method or "piecewise" affine transformations** included **compression in one direction** (stretching).

## Conclusions

**Dürer wanted to innovate the science of human proportions** and his books were **the first books to discuss the problems of comparative and differential anthropometry**.

His **illustrations and drawings** were **marked by the maturity of mathematical and aesthetic theories**.

Materials of these four books, illustrated the **multidisciplinary foundation of the art and science**, served to remind us of our **rich history of the human proportions in paintings**.