

Gravity centre and god's position in children's drawings of gods

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Introduction

One aim of the project "Drawings of gods",^a composed of over 6'500 drawings from eight countries, is to discover which strategies are used by children to answer the complex task of drawing supernatural agents.

Research has shown that **children tend to centre their drawings** (Winner, 2006; Golomb, 1987). However, other studies have revealed that people associate God-Devil with up-down (Meier et al., 2007) and we suppose that **children could draw god in the upper part of the sheet** to express the idea that god is in the sky or above/ upper us.

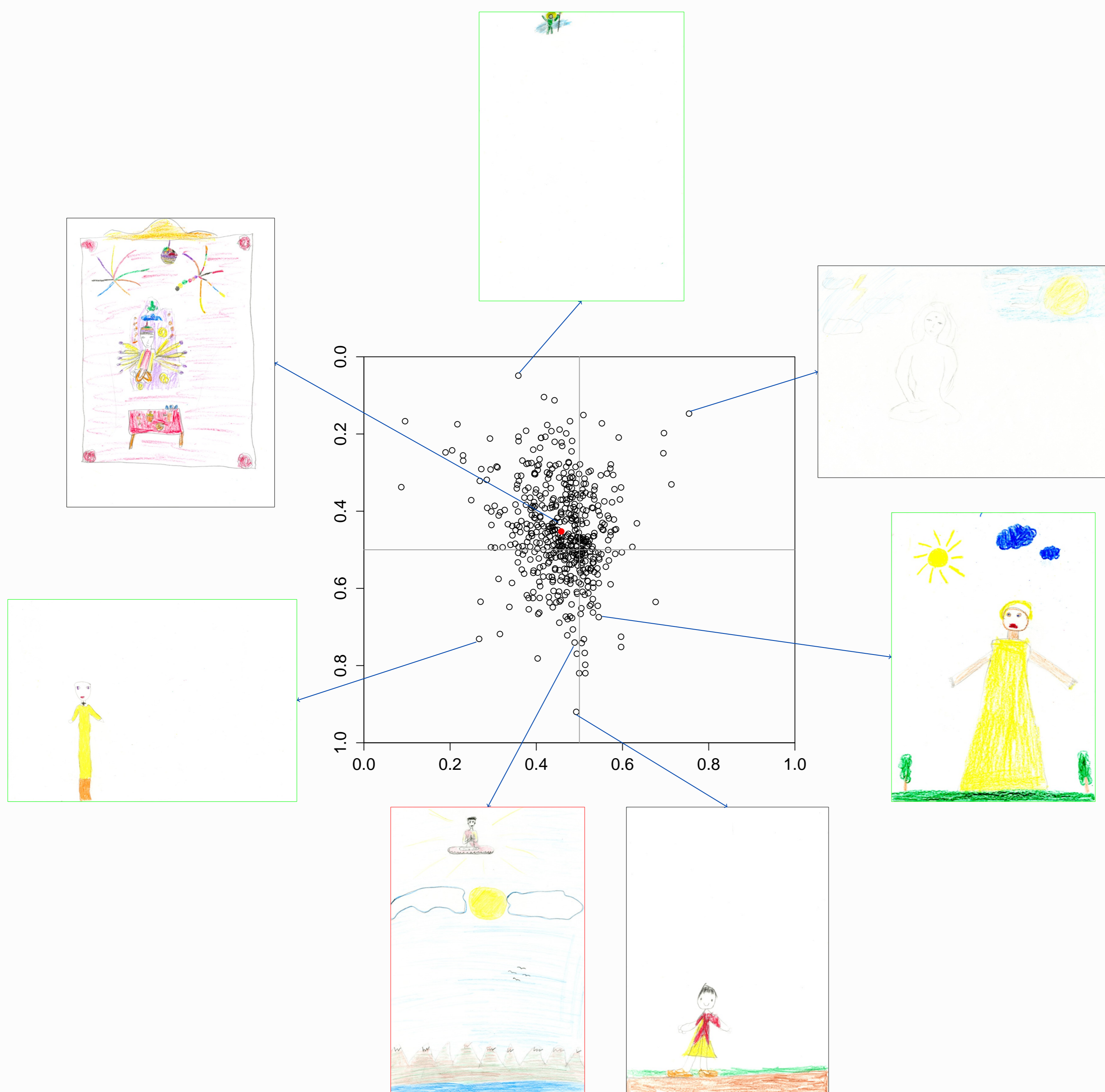
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Dataset and Methods

- In order to challenge these two hypotheses, two methods were used on drawing subsets:
 - Computing the drawing gravity centre, defined as the weighted mean of all coloured pixels
 - Retrieving the god position from a human-made annotation carried out using an online annotation tool
- 513 drawings from Russia were selected according to two conditions:
 - There is one and only one representation of god in the drawing
 - God is identifiable in the drawing and can be annotated

Gravity center of drawings

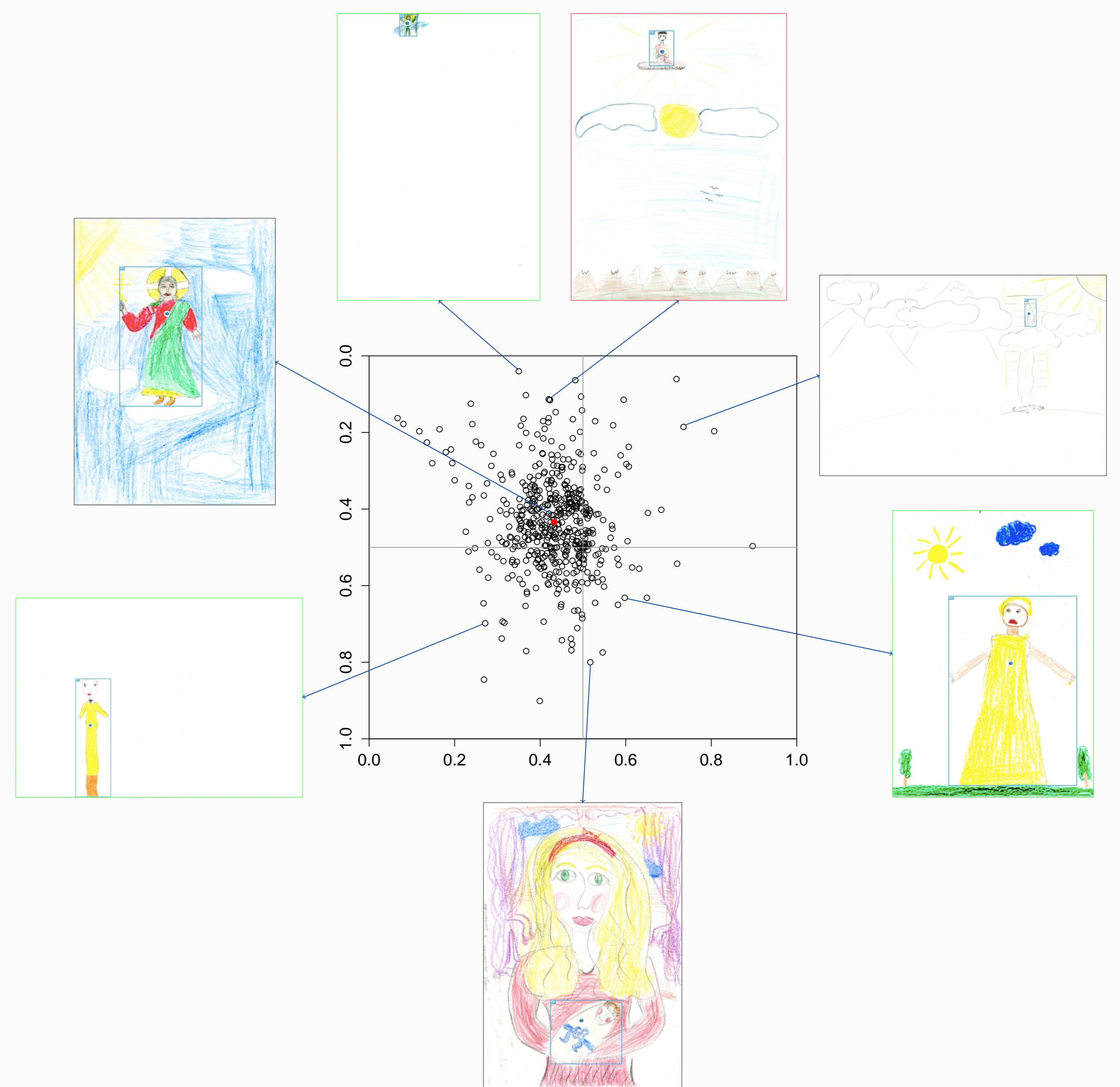
- Each point represents the weighted mean of all coloured pixels for one specific drawing



- The mean coordinates for all the points are (0.46, 0.45). Note that the Y-axis is directed downwards (standard convention in computer vision).
- To test whether drawings are vertically centred or not, the coordinates according to the Y-axis are considered:
 - Data are normally distributed (Shapiro-Wilk test): $W = 0.995$, $p = 0.106$
 - The mean ($\mu = 0.45$) differs significantly from 0.5 and is significantly smaller than 0.5 (upper part of the graph, $t[512] = -8.433$, $p < 0.001$) according to the one-sample t-test

God position

- Each point represents the position of god for one drawing:
 - The drawings were annotated with Gauntlet (<http://d2d.vital-it.ch>) (Dessart et al., 2016)
 - Instruction: delineate the position of god



- The mean coordinates for all points are (0.43, 0.43). Note that the Y-axis is directed downwards.
- To test whether the positions of god are vertically centred or not, the coordinates according to the Y-axis are considered:
 - Data are not normally distributed (Shapiro-Wilk test): $W = 0.987$, $p < 0.001$
 - The median ($m = 0.44$) differs significantly from 0.5 and is significantly smaller than 0.5 (upper part of the graph, $V = 28'652$, $p < 0.001$) according to the one-sample Wilcoxon signed rank test

Conclusion and next steps

While drawings are overall centred, both methods confirm that on average compositions and positions of god are drawn in the upper part of the sheet. The same methods will thereafter be applied to drawings from Switzerland. As a next step, the gravity centre and god's position will be compared to determine if there is a correlation between both measures and to verify if the position of god is centred or not with regard to the whole drawing.


References

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