

# Depicted material categories in online museum collections

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## Introduction

We are interested in how artists depict materials. To gain understanding, we want to create a database of depicted materials.

Here we present preliminary work aimed at finding out what materials are depicted within paintings and if this changed over time.

## Method

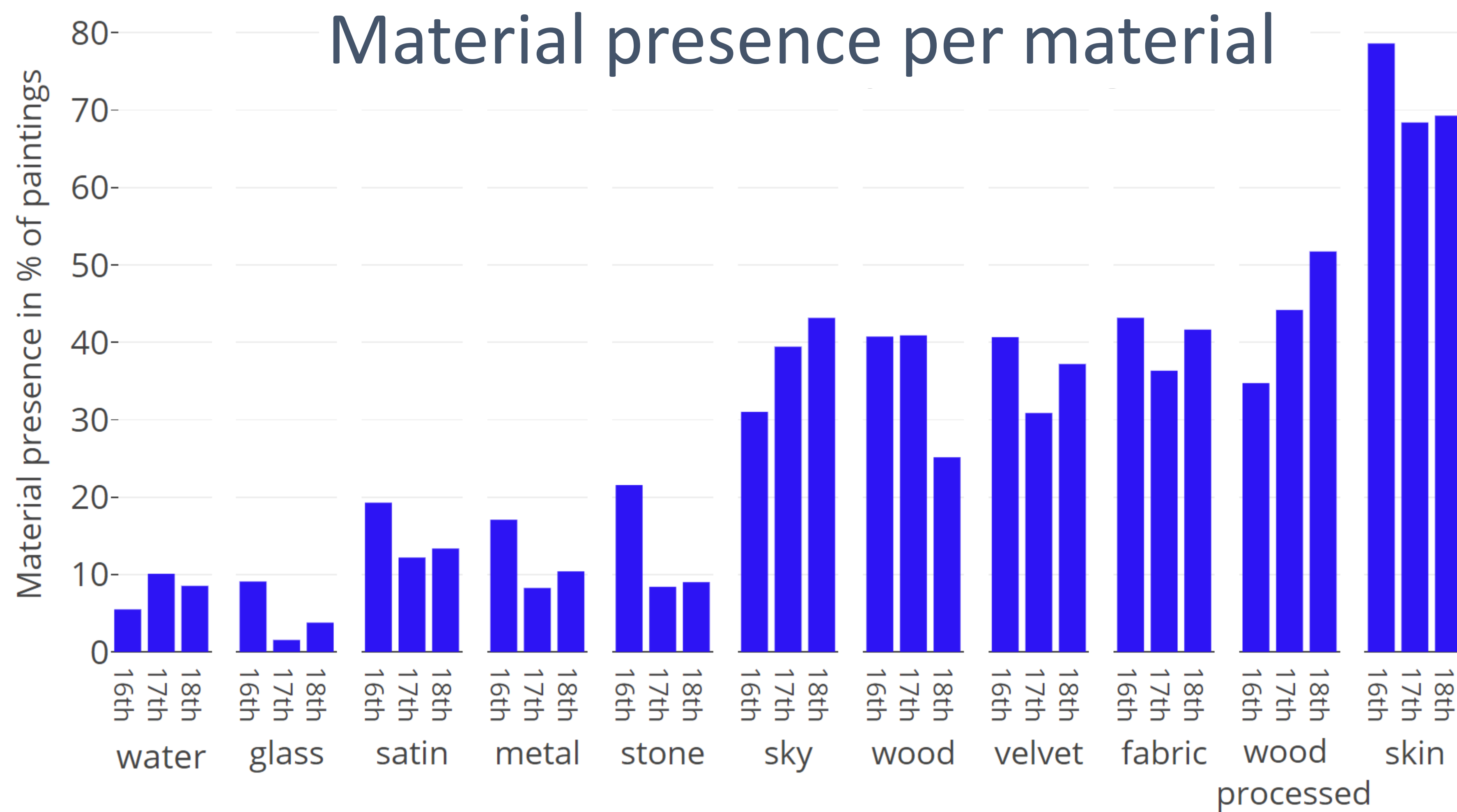
Digital photos of paintings from the 16<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> century were downloaded from the Metropolitan collection. Next we collected material data using crowdsourcing, with the Amazon Mechanical Turk (AMT) platform. We tested for the presence of 11 materials. In each task a worker evaluated whether one material was or was not present in one painting. In total 659 AMT workers completed 35087 tasks. We expect that with evolving techniques and styles, as well as changes in fashion, the likelihood of materials presence in paintings will change over time.

century:	# of paintings
16th	167
17th	355
18th	646
All	1168

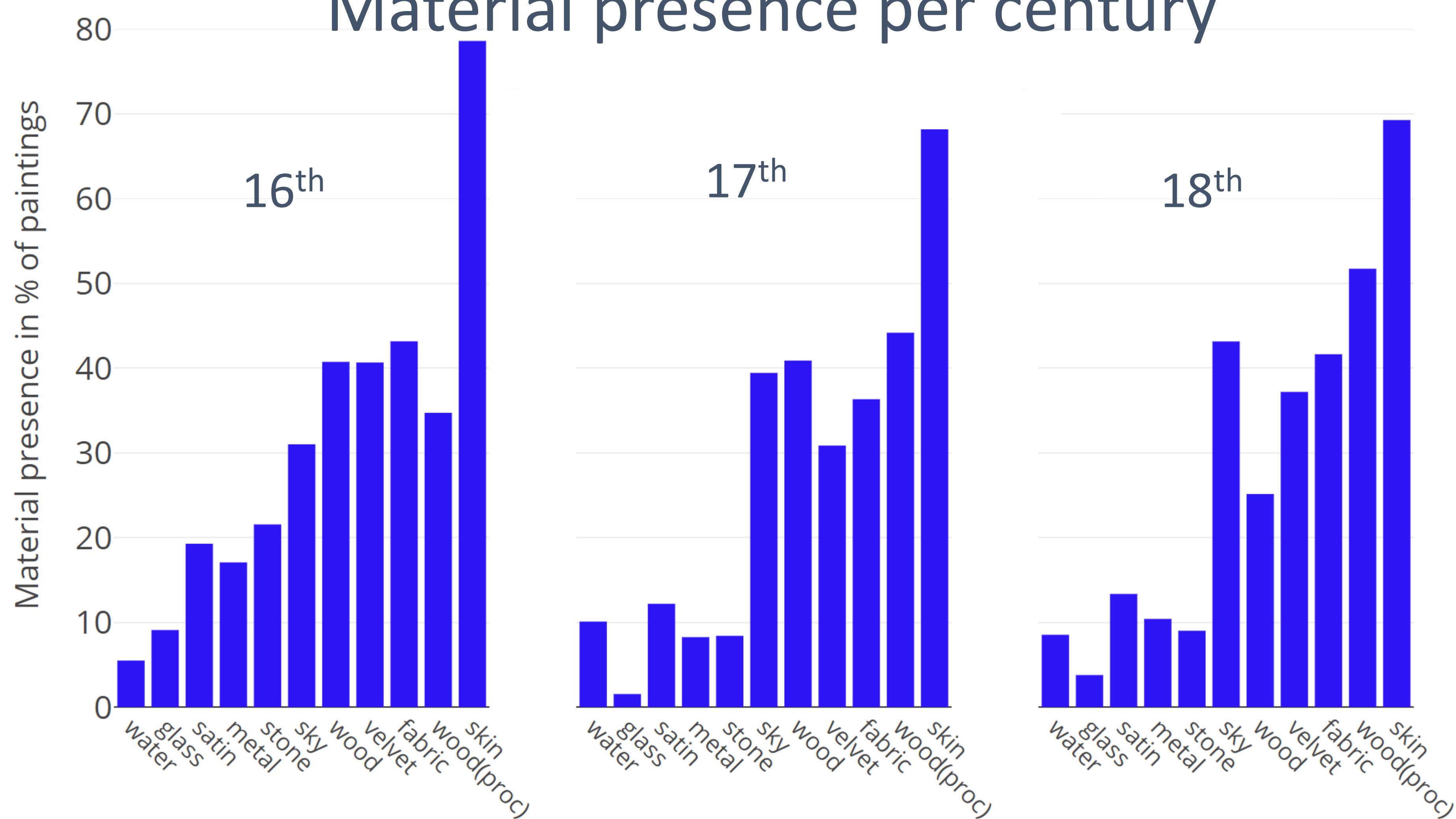
## Analysis

We analyzed the presence of materials, sorted either per material or per century. Furthermore, we combined our data with the paintings dimensions, as available in the meta data from the Metropolitan. In this way we have analyzed the relationship between painting dimensions (portrait vs landscape) and material presence. Paintings that were 1.2x higher than wide were considered to be portraits, and vice versa for landscapes.

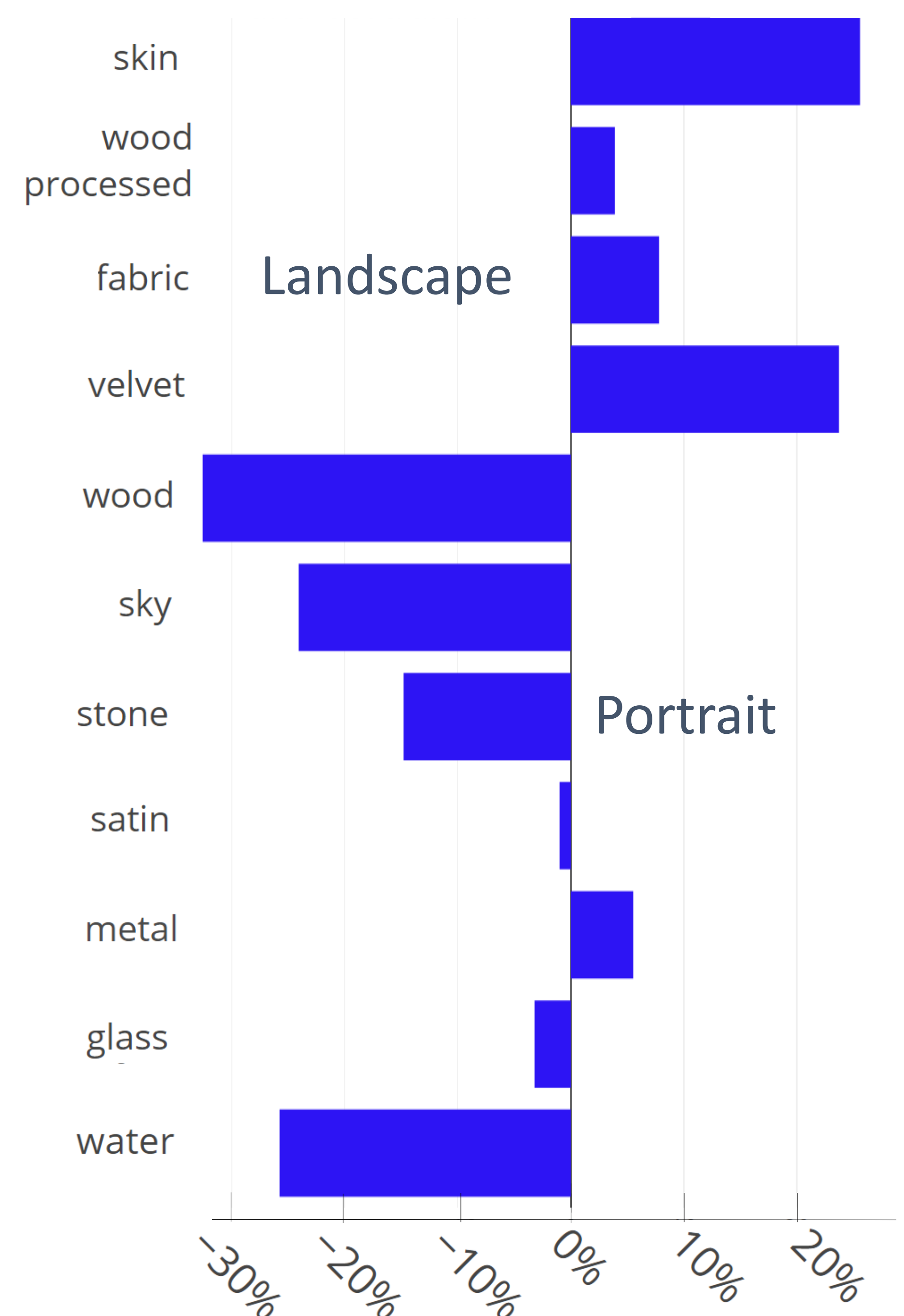
### Material presence per material



### Material presence per century



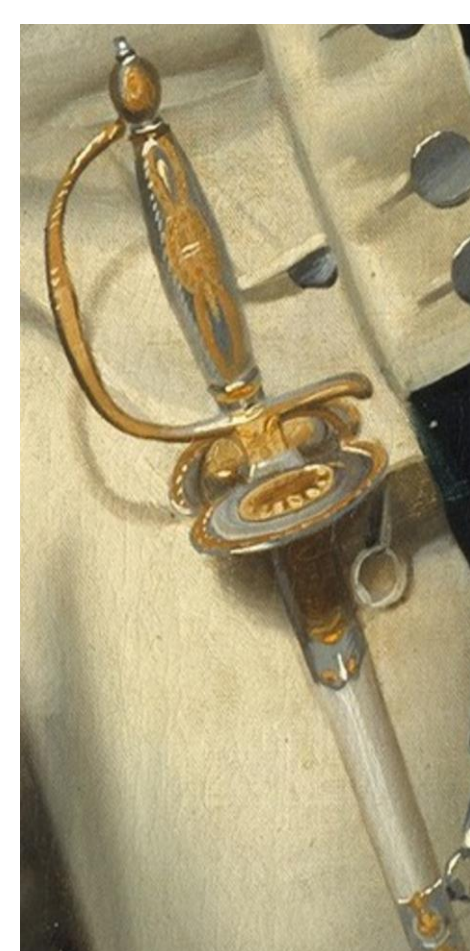
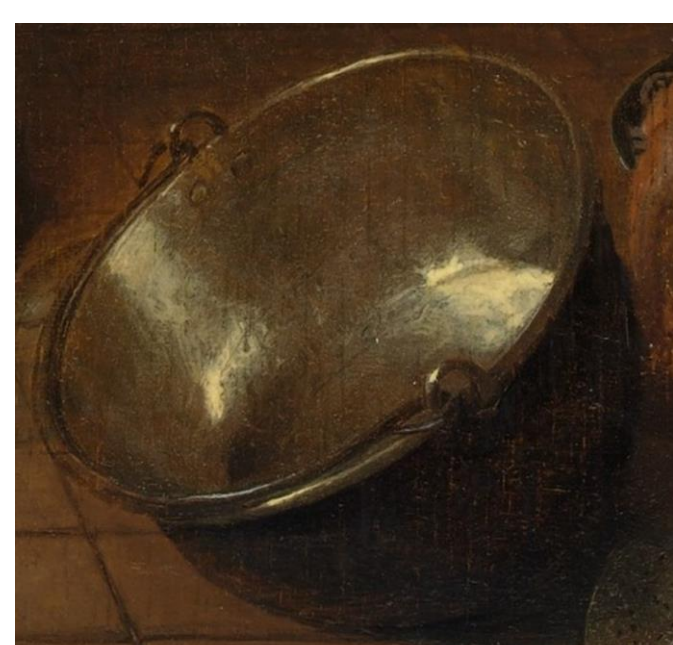
### Material presence within landscape- and portrait-orientation in percentage



The differences between material presence for each material in percentage based on painting orientation (portrait vs landscape).



### Metal



16<sup>th</sup>

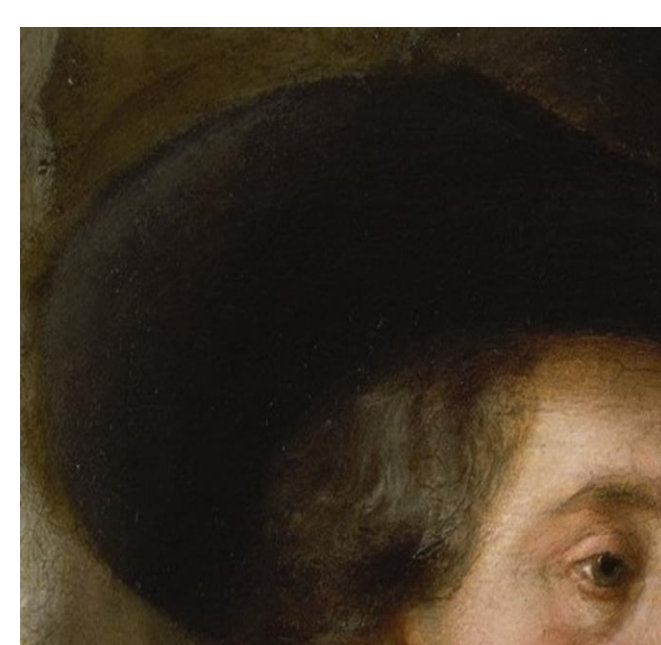
17<sup>th</sup>

18<sup>th</sup>

Left: Three Saints – Cima Conegliano. 1513. Middle: A Kitchen – Hendrick Sorgh. 1643. Right: Marinus Willet – Ralph Earl. 1791.



### Velvet



16<sup>th</sup>

17<sup>th</sup>

18<sup>th</sup>

Left: Judith with the head of Holofernes – Lucas Cranach. 1530. Middle: Rubens, his wife and their son – Peter Paul Rubens. 1635. Right: Portrait of a Young Man – Pompeo Batoni. 1760.



### Satin



16<sup>th</sup>

17<sup>th</sup>

18<sup>th</sup>

Left: Mars and Venus United by Love – Paolo Veronese. 1570. Middle: The birth of the Virgin – Francesco Solimena. 1690. Right: Concert Champêtre – Jean-Baptiste Joseph Pater. 1734.

## Discussion

There is a very large diversity of the presence per material in the paintings. For example, in the 16<sup>th</sup> century material presence ranged from 5 to 78 percent. The diversity per century was less, with satin, metal, stone and glass showing the strongest effects of time: appearing 1.5 or more times as often in the 16<sup>th</sup> compared to the 17<sup>th</sup> and 18<sup>th</sup> century. Sky and processed wood showed the opposite, both appeared more often for later centuries. Fabric, velvet and (human) skin were found more often on portraits, while wood, sky, stone and water were found more often in landscapes, which seems intuitive. Wood was found more often on landscapes, while processed wood was found more often in portraits.

## Acknowledgement

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