"Painting by Numbers"

Visualizing the trade in Dutch paintings in the period 1670-1740 using the Getty Provenance Index Database

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Preface

At the time of writing this thesis, the Digital Art History Journal has two editions (2016 and 2017), showcasing the developments within this branch of research. The journal presents different approaches to supporting art historical research with digital tools or media, with image-oriented analysis and big data as their main focal point. Some of the referenced projects and visual results, like the *direct visualizations* from Lev Manovich, lean more towards being art pieces themselves.\(^1\) And while the development of computational image-analysis is very useful to research visual similarities between a large sample of paintings, as executed by Ahmed Elgammel and Babak Saleh in their research quantifying creativity in paintings for instance\(^2\), for this and many other methods art historians are heavily reliant on computer scientists.

A text-based art historical data analysis project was conducted under the supervision of the art historian Sophie Raux, who from 2008 till 2012, led a team of fifteen researchers of various different disciplines, consisting of art historians, social historians, economics and data analysts. Their goal was to work with the data on the European art market from the fifteenth till the eighteenth century that was available at that time and experimenting with the possibilities for visualizing quantitative research in the art history field. In the article *Visualizing Spaces, Flows, Agents and Networks of the Art Markets in the 18th Century: Some Methodological Challenges* (2013), Raux reflects on the different types of research the team conducted and the challenges they faced with using data analysis for art historical research, like the obvious limitations of the dataset, but also the change from perspective. The traditional art historian is pushed to avoid fuzzy language to fill in the gaps of their analyses. The computer scientists and data analysts are challenged to deal with uncertainty to a certain extent.\(^3\)

The project could be seen as an execution of *distant viewing* on a scale as described by K. Bender in the Digital Art History Journal, viewing art history and the art market in these three centuries as a whole, but this is not entirely true.\(^4\) The project was divided into various topics, covering selected, smaller time periods. The essays of the research team were published in the book *Moving Images. The European Trade in Visual Imagery 1450 - 1850*

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2. Elgammal, Ahmed and Babak Saleh. “Quantifying Creativity in Art Networks” *CoRR*, (June 2015)
Several different datasets were used, for instance, a dataset with archival information about the toll paid for passing through Zeeland from Belgium.\(^5\)

This thesis will serve as a case study of how digital art history can be conducted apart from the image-oriented analysis that is heavily reliant on computer scientists and is more in the same light as the archival data analysis project of Raux.

To continue on the research project of Raux, I will focus on the same theme in roughly the same time period, that is to say, the art market in the 17th and 18th century. More specifically I will look at the period during and after the reign of stadholder William III as King of England, Scotland and Wales (1688-1702), and the changes that took place within this period in the art market compared to the socio-economic and political changes.

It is believed that with the ‘Year of the Disaster’ in 1672 when the Republic was attacked from three sides, and the economic crisis that followed, made that the unparalleled art market collapsed at the end of the seventeenth-century. But as seen in the different essays of the Moving Pictures publication, the market in Dutch masters was not completely wiped away, but it shifted into other forms and dealt with other dealers, clients and hotspots.

As stated in the book *The Auction of King William’s Paintings - 1713* by Koenraad Jonckheere, a positive change took place in the art market when the Dutch Stadholder William III was crowned as the King of England, Scotland and Wales. Important diplomatic figures might have had to visit The Hague for business. For a politician going abroad, it was common practice to delve into the local art market and buy art to take home. Jonckheere implies that the shift of The Hague as an international diplomatic hotspot caused a growth in art sales in this period and must have led to an internationalisation of the Dutch art dealer’s clientele.\(^6\)

In this thesis, I will research if this positive impact is traceable in the Getty Provenance Index, and if so, to what extent. The Getty Provenance Index is one of the biggest open source databases on art sales, containing sales catalogs, dealers stock books and inventory archives, recording the details of every art piece that was sold in the period from the seventeenth to the twentieth century for several European countries.\(^7\) This particular database was not used by the research group of Raux, as it was not made

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\(^7\) Available at: [http://www.getty.edu/research/tools/provenance/search.html](http://www.getty.edu/research/tools/provenance/search.html)
available yet by the Getty Institute. At the time of writing, parts of the Provenance Index still had to be implemented. This is why this thesis will be first to make use of this database regarding this specific period in time, often overlooked in art history. Throughout this thesis, I will criticise the usability of the database and methods for this kind of research question, to further the practical use of digital tools for art historical research.

Earlier research on this field is provided by the economist and art historian Michael Montias, who was one of the first researchers to look at the statistics at the Dutch art market of the 17th century in 1987. His research mainly focused on the number of art pieces that were made in this period and what the costs and profits were for artists and art dealers. The findings of Montias were further examined by Michael North, Claartje Rasterhoff and Raux, among others.

To get an idea of what the trend in the art market in the 17th and 18th century was, I will focus on a specific time period in the history of the Dutch Republic, namely 1670 till 1740. This period of time was tumultuous for Dutch and English history, to say the least. In 1672, the Republic switched from a stadholderless, self-governing union to appointing Willem III as the stadholder in the year of the Disaster. In 1689, William III was established as the King of England, Scotland and Ireland through his marriage with the heir of the English throne Mary Stuart. Eleven years later Willem III would die, and in 1713 the peace of Utrecht was declared, making an end to the Spanish Succession Wars. But it was also the year of the major auction of the art collection of King William III. The historical context is covered in the first chapter. This is just a selection of events and throughout this period there were numerous changes like taxes, wars, treaties and other political turns that may have influenced the trends of the art market. But most of all, this period of time is limited by the database, not every year desired for research is covered, unfortunately.

To visualise the trends in the art market I will use the Getty Provenance Database, of which the database files were (partially) made available for data manipulation. This means that the BASH coding language can be used to index, filter and clean the contents of the database when necessary, for instance deleting duplicate entries or other errors, resulting in a specific dataset within the barriers of my research topic.

Using Python, I can visualize the contents of the dataset to observe different perspectives on the seventeenth and eighteenth century art market in Dutch paintings. First I will graph the total amount of sales for the whole of the Republic in the period between 1670 and 1740 chronologically and compare this with the results of the major

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Dutch cities, exploring whether there is a relation with the period of reign of William III. After that I will look at the contents of these cities in more detail and visualize the results, observing the amount of sales per buyer, the circumstances of the sales and the types of paintings sold. Next, I will use a different method to observe the trends of the genres of the sold works. Lastly, I will compare the number of sales of Dutch artworks in England, France, Germany and Scandinavia, to complement the trends observed for the Republic. The findings from the database are covered in the second chapter and will be connected to relevant literature to create as full of an overview as possible. Detailed descriptions of the codes used on this database are provided in the appendix.

In this thesis I also make use of to the Ecartico database in the graphs on pages 12 and 37. Ecartico is an on-going project of the University of Amsterdam, aimed towards the collection of biographical data on the members of the cultural industries of the early modern Low Countries. The intention of the project is to provide the data to observe and generate social and genealogical networks within the cultural industries of this era. This project is mainly based on the research of Eric Jan Sluijter and Marten Jan Bok. While genealogical and social networks are not the premise of this thesis, the database provides useful insights on painterly activity on an international scale, which is why this database was used.

In the conclusion of this thesis I will not only answer the question whether an increase in sales due to William’s crowning is visible in this specific database, I will also reflect on the work process and usability of this database with the methods used and the limitations encountered, and propose ideas for further research.
Chapter 1: From the Gold to the Silver Age

The state of politics and the art market in the seventeenth and eighteenth-century Republic

To acquire a better understanding of the situation of the art market in the second half of the seventeenth-century, multiple authors over the past centuries have executed extensive research on this topic, be it in the classic, theoretical fashion or with the aid of modern-day data analysis. This period in Dutch history was, and still is, an interesting era not only for art historical research but also in the fields of sociological and economic history. Because we still have access to a wide range of archives that have been kept to this day and saved for the future through digitalisation, this era will continue to be a research topic for many years to come, as reflected in research projects like the one led by Raux. In this chapter, I will point out some developments that happened in the course of the seventeenth-century, which will prove to be important for our understanding of the socio-political situation when William III became stadholder. Furthermore, I will reflect on the knowledge we have on the art market of the late seventeenth-century.

In the following chapter, I will examine whether or not the Dutch art market received an impulse with the inauguration of William III as the King of England, Scotland and Wales, and test this with statistical results.

Stadholder-king William III and the Glorious Revolution

Naturally, the art market did not develop independently from the whole of society. Different factors in the history of the Dutch Golden Age influence the trends in the market, like newly accustomed laws, taxes, economic growth and decline or changing sentiments of the people have led to the status quo of the Republic, and the art market in particular, when William III of the House Orange took his office as stadholder. Therefore, it is important to mention these developments prior to diving into the database concerning this time period. The Dutch art market in the first half of the seventeenth-century flourished (as visible in figure 1), thanks to the growth of the economy, not only caused by the successful overseas trade monopoly of the VOC, but also because of the coincidental positive political circumstances in Europe. During most years in this first half of the seventeenth-century, the Northern provinces of the Netherlands were still at war with Spain, after years of political and religious conflict and the ‘declaration of independence’ of the provinces as a separated Republic in 1581 (the so-called ‘Acte van Verlatinghe’). There were successive years of active warfare and relatively peaceful years. For example, France declared war on Spain in 1634, which meant that the battle with the Republic was temporarily ignored.

The ongoing war with Spain drained both parties financially and morally. Thus, in 1648 the Peace of Munster was signed after seven years of negotiations and the Republic was officially declared and recognised as an independent state. The political organisation of the Republic was unique, the stadholder of Holland being both the most important political
and military leader, with the provinces having their own government and being represented in the national governing body of the Staten-Generaal. Due to the unequalled amount of religious freedom in the Republic, it also became a safe place for Protestant refugees from the surrounding countries with Catholicism as the state religion and where Protestants were persecuted for their faith. On paper, these two political bodies worked together in the interests of the country as a whole, but in real life, this construction proved to be imperfect.

Even though peace with Spain was established, from the 1640s onward the political situation within the Republic destabilised gradually. The current stadholder at the time, William II of the House Orange established a military dictatorship at the end of his reign and was openly discontented with the recency of the Staten Generaal. He deceased in 1650 leaving his son, William III, who was born just 8 days after the death of his father. As a consequence, there was no direct adult successor of the stadholder. This eventually escalated into the First Stadholderless period, due to the political climate being split into two, seemingly irreconcilable factions: regents who existed of and were supported by the bourgeoisie and members of the aristocracy who supported the royal family. The regents took the opportunity of the stadholder’s death and the resulting power vacuum to get rid

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of the function of the stadholder altogether. The regents succeeded and the first stadholderless period started from 1650 till 1672. The political circumstances were disrupted during the reign of William II, and this was amplified during the stadholderless period, especially on the terrain of the handling of foreign affairs. Eventually, this led to two sea wars with England, with the adoption of the far-reaching Act of Navigation as a consequence.

During the stadholderless period, the Republic was never really without a man at the wheel. Johan de Witt was appointed as counsellor of the State, and he was a supporter of the stadholderless Republic. Under the administration of de Witt’s the economy remained stable and the purchasing power was unprecedentedly high. He also managed to expand the Dutch fleet to the extent that the Republic was internationally recognized as a ‘Great Power’ (‘Groote Mogendheid’). But he proved not to be an international diplomatic mastermind. De Witt agreed on the Act of Seclusion when negotiating about peace with England at the end of the First Sea War in 1654. This act entailed that the Republic would not appoint the son of William II as a stadholder in the future. De Witt, as a supporter of the stadholderless state, was well aware that this act would not be appreciated in the still politically divided Republic. In 1667, the Second Sea War ended with the peace negotiations in Breda, in which the Republic had a better negotiation position after the successful attack on the English fleet by Michiel de Ruyter at Chatham. The Republic lost their colony of New Amsterdam (New York) to England, but in return, the English changed some of their trading policies in favour of the Republic. The Act of Navigation still remained. The members of the State (or Province) of Holland came together later that year, to adopt the Perpetual Edict, which meant that they officially rejected the function of the stadholder as commander-captain. De Witt did not agree on this. Louis XIV wanted to expand his empire and take the southern provinces of the Netherlands that were still part of Spain.

The expansionism of Louis XIV was temporarily tempered in 1668 by an alliance of the Republic with England and Sweden. England, holding a grudge against the Republic after the defeat at Chatham, soon after became allies with France, with one shared goal: to defeat the Republic. In 1672 the Republic was attacked from four different sides at the same time by England and France, but also the bishops of Munster and Cologne with an army, claiming north-eastern parts of the Republic as part of their dioceses. This year would later be remembered as the ‘Year of Disaster’, resulting in a severe economic decline, also visible in figure 1.
The supporters of the House of Orange forced the State of Holland that the soon to be adult son of William II would be declared commander-captain of the national fleet. Later that year William III would also be appointed stadtholder. Johan de Witt resigned, but was seen as a traitor by the people of the Hague, and together with his brother, he was publicly lynched. In 1674, William II ended the sea war with England with the help of Michiel de Ruyter and regained the states that were under attack by France and the dioceses of Cologne and Munster. In 1678, peace was signed with France, but the expansionism of Louis XIV was still present. France continued to be a great threat, and to gain England as an ally and after pleas for help by the English elite (the reason why will be discussed later), William went in to battle with the English monarch James II on English ground in 1688 and won, which was later known as the Glorious Revolution. And as result, he was crowned King of England, Scotland and Wales, made possible through his marriage with Mary Stuart, daughter of James II, in 1677.

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10 Map originated from The Map Archive, [https://www.themaparchive.com/glorious-revolution-166091.html](https://www.themaparchive.com/glorious-revolution-166091.html), consulted on 01-08-2018
With the Glorious Revolution, William III became the monarch of a country with its own troublesome history. The second half of the seventeenth-century England was characterised by years of conflict, both internally and externally, as shown in figure 2. The conflicts with Ireland continued under William’s reign. Growing dissatisfaction with the practices of the Church of England (established by Henry VIII in 1534) being ‘too Catholic’, the so-called ‘Puritan’ group of reformed Protestants gained more and more followers. This finally escalated into a civil war (1642-1646) between the English monarchy and the Puritans, which was concluded in the beheading of King Charles I in 1649 and the exile of his family, which left England without a monarchy. England, thus, became a Republic under the reign of the dictator Oliver Cromwell. Under his regime, among other holiday celebrations, theatre and art were deemed as excesses and were restricted. Cromwell died in 1660 and his son was not capable of maintaining his father's dominion. The monarchy was restored when Charles II in 1660 with the help of the governor of Scotland was inaugurated as king of the three nations of the British Isles.

After the death of Charles II, his brother James II inherited the crown in 1685. James II was associated with being pro-French and pro-Catholic, which was highly problematic. Some years prior to the death of Charles II, hysteria against the Catholic following in England was sparked by rumours that the Catholics plotted to assassinate Charles II. For James II to be associated with this religion was seen as dangerous and the English elites called for the help of his Protestant son-in-law, William III, out of fear James II pursued an absolute regime for himself. The deposition of James II was seen as the rescue of the English, Protestant identity and Therefore it was conceived as the Glorious Revolution on the side of the victors: the Protestants. The deposed James tried to the take the throne again in 1690 and was defeated again in the Battle of the Boyne, reinforcing the image of William III as the King of England. William’s wife, Mary Stuart, died in 1694, after which William reigned alone. When William became older and had not brought forth an heir to the English throne, he negotiated with Louis XIV of France about the division of the nations within the kingdoms and empires of Europe when the two rulers were succeeded. Unfortunately, the untimely death of the Spanish monarch made that these negotiations were shoved aside and eventually lead to the Spanish Succession war, with heavy involvement of the Republic until the Peace of Utrecht in 1713. William III died in 1702 and was followed by Queen Anne, the sister of Mary Stuart.11

The art market in the seventeenth-century Republic

As seen above, there were multiple historical events that led to the Year of Disaster for the Republic. But it remains to be seen how this was reflected in the art market.

As described in the chapter 1650-1800: Mature Markets’ in the book Painting and Publishing as Cultural Industries by Claartje Rasterhoff, the art market in the Netherlands also went through several major changes in the late seventeenth and early eighteenth century. The Year of Disaster in 1672 is marked as the starting point for general economic decline in the Dutch Republic, but regarding the art market, in particular, the declining trend was already set in motion in the decades prior, as reflected in the following graph (fig. 3) showing the total number of active painters in the major art-producing cities of the Republic in the period from 1600 till 1700. Before the 1670’s, fewer artists were active, this decline is most noticeable in Haarlem.\textsuperscript{12}

Halfway through the seventeenth-century, the Dutch art market offered a great variety of types of scenes, like history, marine and genre paintings, landscapes and still lifes. As estimated by the economic historian Ad van der Woude in 1987, the Dutch painters must have been able to produce a total between five and ten million art pieces over a period of two centuries. He based his theory on a small sample on inventory data of

![Graph showing the number of painters active in Amsterdam, The Hague, Rotterdam, Leiden, Delft, and Haarlem from 1600 to 1700](source)

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\textsuperscript{13} Chart created with Ecartico online environment, \url{http://www.vondel.humanities.uva.nl/ecartico/analysis?task=origin}, accessed June 1st 2018
households in Delft.\textsuperscript{14} This quantitative approach of art historical research was later revisited by Michael Montias, who used a large sample of data taken from household inventories of inhabitants of Amsterdam, and confirmed that the estimation of Van der Woude was not at all a shot in the dark, but probably close to the truth.\textsuperscript{15} No matter the absolute numbers and scale of the Dutch art market in the seventeenth-century, there undoubtedly must have been a very positive economic climate for the Dutch painters to have a successful career, not only in the capital of Amsterdam but in minor cities as well.

It is safe to assume that there also must have been a great variety in quality with this amount of active painters in this era. This is confirmed by Angela Jager in her data research on art dealers for the lower and middle-class in the seventeenth-century, selling paintings for less than 4 guilders, which roughly equals to the weekly earnings of an average seventeenth-century male worker. Most art historical research on the Golden Age is focused on the top layer of painters, but as Jager found, there was a great market for the lower and middle-class, who spent their disposable income on art pieces for their homes but favoured different types of paintings than the ‘avant-garde’. Because of heavy competition and high demand in the first half of the seventeenth-century, painters were forced to change and develop their subjects, style and skills. With specialisation, the division of labour and new techniques (introduced by the many refugees from the Southern Netherlands), these painters tried to meet the growing demand. Certain themes, like historical scenes, marines or landscapes, were more popular in one century than another, similar to modern-day fashion trends changing regularly.\textsuperscript{16} Even though the art market served almost every layer of the Dutch society and offered a broad variety of painted themes developed through centuries, it seems almost contradictory that from the 1650s onwards the market experienced a decline it eventually could not recover from.

Rasterhoff discusses multiple reasons why the slump in the art market developed in the years prior to 1672. Possible reasons are proposed by earlier authors, like a change in taste of home decoration and reduced purchasing power, the latter she rejects as a possible reason as a demand for luxury goods increased according to C. Lesger.\textsuperscript{17} She also does not


\textsuperscript{17}Lesger, Clé, and Leo Noordegraaf. Ondernemers & Bestuurders : Economie En Politiek in De Noordelijke Nederlanden in De Late Middeleeuwen En Vroegmoderne Tijd. Amsterdam: NEHA, 1999, p.11 - 60.
believe that a change in taste in home decoration, shifting from paintings to luxuriously decorated wallpaper, would explain such a big drop in sales. She states that the most logical explanation would be that there was less demand for newly produced paintings in the Dutch Golden Age style, especially after years of overproduction. Eventually, the ratio between question and demand became skewed.\textsuperscript{18}

As a result, as also researched by Montias, from the total of paintings in the Amsterdam households after the 1650s, only 50 per cent was by the hand of a contemporary artist, after the 1670s even less than 20 per cent was made by a contemporary painter. This negative change in demand for newly produced paintings meant that painters were forced to change or end their activities or move abroad to seek labour somewhere else.\textsuperscript{19} This does not mean that after the 1670’s nobody in the Republic produced or bought art anymore. On the contrary, there were several other players, for whom the art market was still profitable.

According to Marion Boers, there was a separate field for the connoisseurs in the seventeenth-century, who were interested in collecting artworks from the top of the market. But as discussed earlier, the vast majority of buyers must have considered paintings as mere pieces of home decoration and were attracted to just the visual aesthetics, rather than the name of the maker and their artistic ambitions. While many connoisseurs visited the workshop of the master to discuss the value of art before buying a piece, the average buyer wanted an art piece of good quality within its respective price range. For this particular category of buyers, there were several options for buying art without having to enter the artist’s workshop. We have to keep in mind the duality of the occupation of a seventeenth-century painter. While there was a general appreciation of art and a great interest in the artistic ambitions of Rembrandt and similar artists, making art was considered ordinary craftsmanship, just like that of a carpenter, and it was an occupation one could train within a guild. Therefore it is not strange that the common buyer had no interest in meeting an artist.\textsuperscript{20}

One of the common options for buying art was visiting an art dealer. From the 1620s, the profession of art dealer became increasingly more popular. The dealer advised his clients, who often had no understanding of the value and quality of paintings, to choose from a multitude of paintings. And these art dealers had to specialise themselves, just like the artists themselves. There were art dealers for the common man, and the collectors of the top layer of the market could visit the international art seller Gerrit Uylenburgh in

\begin{thebibliography}{9}
\item Rasterhoff, Claartje (2017), p. 262 - 264.
\item Boers, Marion. De Noord-Nederlandse kunsthandel in de eerste helft van de zeventiende eeuw. Hilversum: Uitgeverij Verloren, 2012, p. 50 - 106
\end{thebibliography}
Amsterdam. The first art dealers were often schooled artists themselves, thus were presumed to be knowledgeable and trustworthy. There were art dealers whom themselves had one or multiple painters working for them in-store, earning a (very) small share of the dealers’ profit. This was a relatively low-risk method of selling art, the dealer had to pay the painters a small wage or paid per finished piece, and in return, he received stock to sell with possibly a fairly large profit.\textsuperscript{21}

There were also art dealers who purchased their own goods on the market to resell, which meant that they needed to have a certain amount of wealth to start with. It was cheaper to buy directly from colleagues compared to private clients, but this method evidently involved a higher risk by investing one’s own money. The dealers who followed this method needed to have a great eye for quality and marketing to stay on top of their game and often had another (main) occupation where they gained their wealth from. One of the other channels for art dealers and private buyers to obtain art pieces were auctions. In the first half of the century, often whole household inventories were publicly auctioned at small auction houses. The preserved administration of the so-called Amsterdam weeskamerveilingen, a non-commercial institution whose proceeds went to the local orphanage, tell us about the lots sold and the buyers. This is also one of the archives included in the research of Michael Montias about the seventeenth-century art market. The inventories could originate from a deceased common middle-class civilian, sometimes containing art pieces. But more interesting were the household inventories of collectors, art dealers or artists who went bankrupt or deceased. At first, these auctions were mostly visited by family members, later it attracted middle and higher class merchants and art dealers as potential buyers. The local art guilds were not happy with the emerging trade of art at auctions, which they deemed unfair competition of the local art scene. According to Montias, the art that was auctioned in the seventeenth-century took up just a small percentage of the art market as a whole. Later in the century, separate professional art auctions were organised by the local Lucas-guilds to regulate the sales, and specific professional art auctions sparked the interest of international buyers. Collectors often used representatives who bid for them when they could not be present at the auction themselves. Because of art dealers and auction houses dealt with the bankruptcies of individuals and companies and estates of deceased art collectors and painters, they could continue their activities after 1672. Art dealers had the possibility to purchase art for even lower prices because of the oversaturated market and presumably had an international clientele to sell to. For example, this was the case in Antwerp where Dutch art found its way into the Parisian art market.\textsuperscript{22}

\textsuperscript{21} Boers, Marion. (2012) p. 50 - 69.

\textsuperscript{22} Boers, Marion. (2012) p. 70 - 87.
And then there were many other ways for the common man to acquire, or even win paintings. It was not uncommon for artists to sell their paintings at weekly open-air markets or yearly fairs, and paintings were even offered as prizes at lotteries. I will not get into detail about all these different ways of obtaining art, but this confirms that there must have been a broad selection of paintings in circulation and spread via a variety of practices.

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Chapter 2: The Getty Provenance Index Database

The Getty Provenance Index Database is a highly interesting source for research on the topic of the Dutch Golden Age, but many other important or revolutionary eras in art history, because it is one of the biggest databases concerning art sales in early-modern Europe that is openly available and updated regularly. In this chapter, I will discuss the contents of the database in general and the specified dataset in detail. After that, I will explain the several methods used, some more fruitful than others due to the limitations of the database.

Introduction to the database

In total, the database is made up of records of archival inventories, public collections and payments to artists. At the moment of consultation, the available digitized material is sales catalogs, which can be found as 13 separate tubular files, and dealer stock books covering most of the nineteenth century, which can be found under the ‘Knoedler’-file, based on the Knoedler Gallery archive. The sales catalogs database includes data on sales recorded by European auction houses and art dealers. As the following graph (fig. 4) shows, the Provenance Index Databases contents are majorly based on sales catalogs, with over 1.2 million records. Even after filtering on a specific time period or location, this database should provide with a big enough sample to review.

![Provenance Index Databases Overview](http://www.getty.edu/research/tools/provenance/charts.html)

The records of the Dutch sales catalogs are based on 766 original documents total, of which 627 are digitized and 139 are not yet digitized, as shown in figure 2. The Dutch sales from the periods 1671-1740 and 1801-1820 are covered in the database, the first time period overlaps the reign of Stadholder-king William III. This is why I will use this specific dataset as a starting point. Additional info about the seller and location of the mentioned sales in the catalogs is added in a separate file, information about the original source files

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24 Graph originated from: [http://www.getty.edu/research/tools/provenance/charts.html](http://www.getty.edu/research/tools/provenance/charts.html)
can be found in another file. Both files are provided on the Github of the Getty Provenance Index.

The graph in figure 5 shows that the years 1671 to 1740 are covered in 147 original documents. For a large part of the dataset I use, the source material is covered in the ‘catalog of catalogs’ by Gerard Hoet in 1752. Later, the findings of Hoet were supplemented by Frits Lugt in 1938 in his Reportoire des Catalogues de Ventes Publiques. The records taken from the publications of Hoet and Lugt are complemented in this database with original source documents that were unknown to these two writers and give as full of an overview as possible. Most of these original documents are currently held by the RKD (The Netherlands Institute of Art History) or can be found in several museums and libraries.

**Mapping auctions in the Republic**

As said before, the Github of the Getty Provenance Index provides 13 files with the contents of the sales catalogs, without an index of where to find specific records. The Dutch sales are placed in two files, with a total of 9934 unique sales records between the years 1676 and 1740 in the Northern Netherlands. The Southern Netherlands is covered in a separate dataset and are not taken into account for this thesis. The sales content files

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25 Graph originated from: http://www.getty.edu/research/tools/provenance/charts.html


consist of 480 columns, distinguishing unique record ID, artist, object, title, seller, buyer and auction house and many more identifiers. For multiple rows, these details are not recorded or known. The locations where the sales took place are not included in this dataset, but had to be connected to one of the additional files. From the total of 9934 rows, the graph from figure 6 is produced. For the total amount of sales in the Republic, it can be said that a slowly rising trend from 1680 and onward is observable in the graph, but without knowing the contents of the sales catalogs, it is difficult to say what this plot actually represents. Therefore, it is necessary to break down the contents of the database on a smaller scale, beginning with location.

Jonckheere suggests that there was a growth in art sales in the Republic due to the international nature of the reign of King-stadholder William III. The graph of figure 3 in the previous chapter shows that only Amsterdam and The Hague were attracting painters in the late seventeenth-century, with The Hague showing a slight growth in the 1680s, which is why I will look into the database results for this city in more detail. Christopher Wright even speaks of a ‘Hague school’, which developed thanks to the increased status of the Stadholder. To visualize the trends in the various Dutch cities, the dataset had to be

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28 This graph, and the graphs shown from this point forward, are produced by me, unless stated otherwise.


combined with the additional file with topographical information about the sales, which results in the graph of figure 7, representing the three cities with the most records: Amsterdam, The Hague and Rotterdam.

![Recorded sales per year in major Dutch cities, 1676 - 1739](image)

Figure 7. Overview of total sales in the Republic against the recorded sales in The Hague, Amsterdam and Rotterdam in the period 1676-1739.

For the first half of the period shown in the graph, the line representing the total of sales is following the line of recorded sales in Amsterdam. After 1710, this changes, and Amsterdam seems not to be the leading city anymore for a period of time. For instance, the noteworthy peak in the total amount of sales in 1713 is mainly formed by the sale of 148 works from the collection of one ‘Jean Walron Sandra’ in Middelburg. The total recorded sales in Amsterdam are going down till the 1730s, at the same time, the sales in other cities are going up.

My research is focused on the reign of Stadholder-king William III, I will therefore focus on results of the period from the earliest year covered in the database, 1676 until the stadholder’s death in 1702, assuming most changes should be visible within the span of his lifetime. But I also take the auction of his collection after his death in 1714 into account, which was planned after the peace of Utrecht which ended the Spanish Succession wars. Since the dataset is limited, I used the full-time range available in most cases, namely until 1740, which in turn provides a broader view of the distribution of sales. Until this point, the cities with the most recorded sales in the database are Amsterdam and The Hague, also confirmed by Rasterhoff in her visualizations of the distribution of prominent painters in
the Republic based on the RKD database (similar to fig. 3 in the previous chapter). While it is not part of this thesis, it is worth noting that Rotterdam shows an interesting growth in the eighteenth century as well.

If we can speak of a visible positive trend, possibly influenced by the international politics of William III, it should be noticeable in the graphs representing the two cities with the most recorded sales. I start with The Hague because in this city the government and court of the stadholder were seated and again, it is stated that the character of the city changed after the crowning, according to Jonckheere. In the following graph (fig. 8) the lines representing the recorded sales in Amsterdam and The Hague are isolated and three key events in history linked to William III are added as a reference. The data until the year 1740 is used in this graph as well, to keep the same scaling as the previous graph and to see the development of the plots further in time.

As previously stated, there is no data present from the period prior to 1676 unfortunately. To give some sort of context, the total of almost 10,000 records in this database for the 70 year period after 1670 is just a mere fraction of the total amount of works that must have been made prior to 1670.

![Graph](image)

**Figure 8. Overview of the sales in Amsterdam and The Hague in the period 1676-1739.**

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As mentioned, Van der Woude and Montias calculated that the total amount of works of art produced in the golden era of the Republic must have been in the millions.\(^\text{32}\)

While it could be said when observing figure 6 that there is growth visible for The Hague, as found in the plotted growth for the totality of the Republic as seen in figure 4 and 5, it immediately stands out that the dataset concerning The Hague does not contain as many records per year as compared to Amsterdam. The Amsterdam dataset includes 6623 records, the dataset of The Hague only 1401. For the The Hague dataset in the decennium between 1690 and 1702, when William III was still alive and could actively influence the art market in any way, there are sales recorded for just two years: 1692 and 1693. The next year covered in the recorded sales is 1713, which is a twenty-year gap and ten years after the death of the Stadholder-king.

There are a few possible explanations why there are only a limited amount of listed points in time for The Hague. The most obvious possibility is that more sales catalogs have existed, but did not survive the test of time. The collection of announcements of 150 art sales between 1672 and 1711, retrieved by S.A.C. Dudok van Heel in 1975 from the Amsterdam archive of the local newspaper can be used to check if this would be reasonable to assume. The collection of announcements shows that it was common for art sales to be marketed beyond the city of sale. For instance, planned sales and auctions in Antwerp were frequently announced in the Amsterdam newspaper.\(^\text{33}\)

The announcements match with recorded sales for the Hague in the database and reveal no other sales that are not mentioned in the database for this city. According to Dudok, the newspaper announcements were not used by Hoet nor Lugt when compiling their catalogs, and provide additional information about some of the recorded sales in their catalogs or even mention sales that were unknown until up to 1975. Dudok explains that the archives of the years 1676 and 1679 till 1683 are missing, which are six years in total. This implies that the gap between 1693 and 1713 is not necessarily caused by missing archives, and Therefore, it can be assumed that there just were not that many art sales in The Hague as compared to Amsterdam in this period.

And this can be explained as well. Rasterhoff states in her chapter on the art market of the late seventeenth-century that The Hague and Amsterdam remained the two most attractive cities for painterly activities after 1670. The explanation for this was that the established bourgeoise was settled in these cities from the beginning of the seventeenth-century, and they continuously provided commissions for new artworks, even after the Year of Disaster. At the same time, the number of active painters after 1670 was a mere fraction


of the high numbers in the decades prior, the number of active painters declined in the second half of the seventeenth-century. This means that in the first half of the century the number of commissions were divided over multiple Dutch cities and often executed by local painters, after 1670 the commissions that were left were centred in Amsterdam and The Hague, attracting painters from all over the Republic. According to Charles Dumas in his description of the art scene in The Hague, this was already the case for The Hague in the first half of the seventeenth-century because there was only a small community of local painters. I will get into this in more detail later on.

This seems contradictory with the small number of recorded sales in the graph above (especially in relation to the high amount of recorded sales for Amsterdam), but even in this database, The Hague is the city with the second largest amount of recorded sales for the time period prior to 1700. Nevertheless, this particular database is not concerned with the types of commissions as described above. Commissions for portraits or other specific scenes were often handled directly with the painter concerned, and as the parallels with the collection of newspaper announcements show, the database records (mostly) concern public art sales.

Thus, there was a considerable amount of commissions for active painters, mainly portraits, but only a few public art sales recorded in The Hague. There is no documented or known information in the database about the auction house or art dealer when applicable. As described in chapter 1, there were different types of auctions, from the special ‘weeskamerveilingen’ in Amsterdam, whose profits went to the local orphanage, to specialized art auctions organized by art dealers. Therefore it is needed to look at the contents of these listed public art sales and differentiate which kinds of auctions were held in the period of the reign of Stadholder-king William III, beginning with the recorded buyers.

Foreign buyers?
Information about the buyers recorded, most particularly their origin country, would give a direct answer to the question if and to what extent international buyers were active on the Dutch art market and The Hague specifically. But unfortunately, there is no available information about buyers in The Hague for the whole period between 1670 and 1740, they are all notated as ‘Anonymous’ or data is missing. The information about the buyers in the whole of the Republic in this period is very limited as the chart in figure 9 shows.


Figure 9. Overview of the recorded buyers in the Republic in the period 1676-1740.

The following names recorded as buyers were very prominent figures in the Dutch art scene at the time and were all involved with the auction of the collection of William III. Jan van Beuningen (1667 - 1720), for example, was director of the Dutch West Indian Company and art dealer, and organised the auction of the collection of William III in 1713.36 Andries Pels (1631-1681) worked as a lawyer in Amsterdam, and was an art theorist and co-founder of the Amsterdam art society ‘Nil Volentibus Arduum’.37 Philip van Dijk (1683 - 1753) was an art dealer in The Hague and Amsterdam, and worked as a court painter and agent of William VIII, after 1747 he became the court painter of Prince William IV of Orange. His own art collection was auctioned in 1753.38 Robert Griffier (1675 - 1760), was an art dealer and is listed as a copyist and falsifier of art. He originated from England but settled in Amsterdam in 1716.39 He is the only confirmed foreign buyer and he bought only one piece.40 These records are just 62 of the 9934 records total, thus not giving a

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36 Jonckheere, Koenraad (2008), p.37-54

37 Jonckheere, Koenraad (2008), p.41-43


39 As described in the RKD Database: [https://rkd.nl/explore/artists/73803](https://rkd.nl/explore/artists/73803), consulted on 06-08-2018.

40 Jonckheere, Koenraad (2008), p.150-151
proper overview of the buyers in this period, forcing another perspective on the database to get the desired results. The documented sellers and contents of the sold collections might give useful information about the nature of the public art sales concerned in The Hague, which is why I will look into this next.

The Hague

While the database provides little to no information about the buyers, almost all sellers concerned were recorded, which could tell something about their origins and the audience these public art sales were targeted at. The following graph shows all the recorded sellers, the year of the art sale, and the total of works sold in every art sale or auction in The Hague for the period between 1670 and 1740. For just a few of the art sales, the seller was not known.

It is already established that there were sales recorded for two consecutive years only in The Hague, namely the years 1692 and 1693, in the chart below (fig.10) it is made clear that these records are clustered in two different public sales. The first dataset from 1692 concerns an auction under the supervision of Johan van Tongeren. His occupation was ‘Advocaet voor de respective Hove van Justitie van Hollandt’, or lawyer of the Court of Justice of the province of Holland, and therefore is very likely that this was an auction following on bankruptcy. Johan van Tongeren is not known as an art collector or

![Amount of works sold per seller in Den Haag, sorted on year](image)

Figure 10. Overview of the recorded sellers in The Hague and the number of works sold by them in the period 1670 - 1739.
art dealer himself. There is also no information about the original owner (or owners). The auction consisted of 84 works of art from various international painters, but for the most part of Dutch descent. In this collection were some prominent, but mostly lesser known or indistinguishable painters from the sixteenth century and the first half of the seventeenth-century. The most recorded artist in this collection is ‘Bamboots’, otherwise known as Pieter van Laar. Other notable names are Rembrandt and the brothers Andries and Jan Both. For the auction in 1693, Reinier van der Wolf is recorded as the seller, who was an art collector and dealer in Greek and Roman antiquities. Van der Werf passed away in 1679, the auction of a small part of his collection took place in 1693 posthumously. This particular auction consisted of just 11 works from different artists, mainly Italian and Dutch painters. Recorded are ‘Francesco Parmiggiano’ (likely Parmigianino), ‘Bamboots’, Jacob Pinas, and other indistinguishable names. It is worth noting that the Dutch artists Pinas, both brothers Both and Bamboots have in common that they were inspired by Italian art and painted in the so-called Italianate style, which was a popular style in Dutch seventeenth-century landscapes.

In general, these auctions concern art collections that involve artists that were active prior to 1670 and were not organized by the collectors themselves. For the next auction in 1713, a year prior to the auction of the collection of William III, Cornelis van Dyck is recorded as the seller. Not much about him is known, but it is notable that this auction concerns about 150 works in the database, unfortunately, all of them have the same details, namely: ‘A piece by C. Poelenburg, portraying the birth of Christ of Bethlehem, rich in imagery, and beautiful of color palette as he is known by, on a copper plate.’. It is hard to believe that Poelenburg painted 150 versions of one scene, so it probably is an error in the database. This means that there are only two auctions in this period in The Hague to work with.

In my opinion, these two or three auctions on their own are not a proper representation of the art market after 1670. And even though the database shows that The Hague has the second largest amount of recorded sales and active painters after Amsterdam, the art market in this city was in no way comparable with the market of Amsterdam in scale and professionalism. Carola Vermeeren states that art dealers were not present in The Hague. I

41 As described in the RKD Database: https://rkd.nl/explore/artists/47343, consulted on 06-08-2018.
42 As described in the RKD Database: https://rkd.nl/explore/artists/437817, consulted on 06-08-2018.
do feel the situation was a bit more nuanced than that. This period is characterized by
painters who were not permanently settled in one location long-term, but were active in
more cities than one. This was also the case for art dealers in this period. The seller Reinier
van der Wolf, for example, was active in Rotterdam as an art dealer but organised an
auction himself in Amsterdam in 1677, and his posthumous auction in 1693 took place in
The Hague. Besides, the Amsterdam newspaper announcements already showed that most
sales were promoted across the Republic. What can be concluded is that after 1672 in The
Hague there is no immediate reason to assume that William III had any direct influence on
these public art sales based on this dataset alone. There is no relevant growth observable,
and one auction even concerns a bankruptcy. Further research on another kind of source
material if available would be needed to get a better understanding of the situation in The
Hague.

As mentioned before, the period after the Year of Disaster was economically challenging
for different industries and branches of business in the Republic. Rasterhoff refers to the
research of the economic historian Clé Lesger to prove her statement that the purchasing
power in the Republic and the demand for luxury, in fact, did not decline after 1672. In
his article on the economy of the Republic after 1672, J.L. van Zanden explains that not all
branches of business were subject to regression to the same degree and that location plays
a role. At the end of the seventeenth-century, the economy stagnated compared to the years
of growth prior to 1672, but stabilised relatively quickly in the eighteenth century. As a
result, some people fell victim to bankruptcy.

It is possible that the auction supervised by Van Tongeren serves as just one
example of a salesman who went bankrupt and whose collection was auctioned to pay for
his dept. Because of this, it is also not strange that there were no professionally organised
art auctions in The Hague in this period specifically, even more so when Rasterhoff
rightfully so claims that most collections were oversaturated at this point already. There
was a weekly market on the Binnenhof, the public courtyard in front of the medieval
Ridderzaal, where the stadholder and the members of the provinces of the Republic came
together to discuss national affairs. At this market, artists from the Hague would sell

43 Vermeeren, Carola. ‘Opdat de kunst alhier soude mogen floreren’ De kunstmarkt in Den Haag in
Eeuw : Het Hoogsteder Lexicon Van Alle Schilders Werkzaam in Den Haag 1600-1700. Den Haag:
Kunsthandel Hoogsteder & Hoogsteder, 1998.p. 51


popular scenes, like landscapes, marines and genre paintings. The local painters’ guild (Lucasgilde) prohibited artists from other cities, like the nearby city of Delft, to sell their paintings on this market.\textsuperscript{46} It seems plausible that foreign diplomats concerned with international affairs visiting The Hague would encounter this market at the core of the Republic’s political centre, besides the organised (art) auctions. These sales are not taken into account in this database. Furthermore, while the court had it’s residence in The Hague and the Palace at Het Loo remained the stadholder’s palace, William III seldom came back to The Hague once he was inaugurated as king. Most affairs were handled at his office in England. Specific affairs in the Republic would be handled by his direct representatives, who were mostly of Dutch origin themselves.

Because The Hague offers such a small sample, it is appropriate to observe the contents of the Amsterdam public art sales in the same time period. The trend of the total of sales in the Republic mainly follows the Amsterdam trend as seen in figure 5, and therefore this trend could tell us more about the condition of the art market based on these public art sales and the possible influence of the international politics of William III. The newspaper announcements show that many auctions were marketed nation-wide and most of them took place in Amsterdam.

\textbf{Amsterdam}

Amsterdam lies about 50 kilometres from Den Haag. In the seventeenth-century, this would have been a one day of travel by horse, most likely through Leiden and Haarlem (taking travelling around the later drained lake ‘Haarlemmermeer’ into account). And naturally, Amsterdam had become the wealthy city it was thanks to the well-organized port of Amsterdam, where not only goods but also international travellers entered and left the Republic. It is very much possible that these foreign travellers would pay a visit to Amsterdam, even if their business was only in The Hague. In Amsterdam, they would encounter the workshops of painters or art dealers and had the possibility to obtain art pieces in lotteries and markets as described before. These are not traceable in the database. To look at the public art sales they could have been involved with, these sales and their sellers were plotted in the same way as the sales of the recorded sellers in The Hague in figure 10.

The graph in figure 11 shows the 5 known sellers of public art sales prior to 1700 in Amsterdam, from the total of 11 recorded art sales, the rest of the sellers were unknown.

\textsuperscript{46} Vermeeren, Carola. (1998), p. 51
I consulted the RKD archives to get to know these sellers better if possible. Dissius and Van Swoll were known collectors of Dutch paintings, both living in Amsterdam.\textsuperscript{47} The one name that is notable is of Henry Howard, 6th Duke of Norfolk. Henry Howard is not recorded in the RKD database as an art collector or in any other fashion, but his relative Thomas Howard, (1585 - 1646), was one of the biggest art collectors of Europe at the time. Thomas Howard was famous for collecting both Italian and Dutch paintings and antiquities. Recording to the RKD database, part of his art collection was auctioned in 1684 in Amsterdam, which must be the records in the Getty database, inherited by his family great-grandson, Henry Howard.\textsuperscript{48}

This serves as the first indication that English collectors were active on the Dutch art market, though this case does not directly concern the buying of art, but selling. Why would the Howard family auction the collection of Thomas Howard in Amsterdam instead of in London? While Thomas Howard was officially the Duke of Arundel, he took his residency in the Republic. Firstly, organising the sale in Amsterdam was the most convenient because Thomas Howard lived in the Republic, so (part of) his collection was in the Republic and Amsterdam offered several options like lotteries, art dealers and auctions

\textsuperscript{47} As described in the RKD Database: https://rkd.nl/explore/artists/459499, consulted on 06-08-2018.

\textsuperscript{48} As described in the RKD Database: https://rkd.nl/explore/artists/431957, consulted on 06-08-2018.
to sell these art pieces. Secondly, the Howard family were officially members of the Church of England, but (presumably) practised the Catholic religion, and because of the tumultuous history of persecutions against Catholics and quarrels with the English parliament and/or monarchy, several members of the Howard family moved away from England to the mainland. After the death of Thomas Howard, his relatives had a long ongoing conflict about the inheritance, which explains the gap between his death and the auction. In the sold collection of Howard among others were works from Van Dyck, Rubens, Titian and Breugel. These respected names also return in the auctioned collection of William III himself, which makes it not unthinkable that the auction of Howard’s collection would attract foreign collectors, or their representatives, to Amsterdam to bid on the lots. At the auction of the collection of King William III, it is confirmed, for example, that there was a fair share of international buyers present.

At this point, it seems to be fair to assume that foreign buyers must have roamed the Dutch art market to buy paintings and other artworks, although this is not directly traceable in this particular database. In the following paragraph, I will discuss an alternative method of working with the database that might reinforce this conclusion, namely looking at a possible shift in painted themes targeting a changing, and possibly international audience. Later I will look at the dataset consisting of the recorded artworks sold in England to look for results that might answer the question to what extent the art sales were influenced by the Stadholder-king.

Shifting perspectives 1: Change in genres?

It could be beneficial to look at the most popular genres sold in this period. If there is a noticeable change through time regarding the most popular genre sold at these public art sales in this database, this could indicate that painters changed their subjects to accommodate to a different, and possibly foreign audience, as is previously stated by Rasterhoff and Michael North. According to Rasterhoff this was accelerated by the change in the kind of commissions by the Dutch elites after 1670, there was still interest in portraits and particular scenes, but clients commissioned (painted) interior decoration or restoration of art pieces over newly produced artworks due to over-saturation of their

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50 Jonckheere, Koenraad (2008), p.131-203

collections at this point. For example, in the household of stadholder William III himself, a small company of (local) painters was appointed to deal with these kinds of decorative and restorative activities within the stadholders palace. In the case of bigger commissions, like portraits of the family, the best contemporary painters were brought in, and more often than not, these painters were mainly active in Amsterdam. As mentioned by Dumas, choosing the country’s best painters over local masters was in line with the representation of the court internationally, showing off to foreign visitors.

![Average prices in guilders of pictures by subject 1600 - 1700](image)

Figure 12. Overview of prices paid for different genres of paintings in the period 1600-1700.

North uses the research of Alan Chong as the reference to map the average prices in guilders of pictures by subject in the period from 1600 to 1700, plotted in figure 12.

In figure 12 it stands out that after the 1650s the price for paintings with religious subjects drops, the prices for architectural subjects already began to slump in the 1620s, whereafter it drops drastically from the 1650s onward. These distinct price drops, and price increase of the so-called ‘genre’ paintings at the same time in the 1650s, is the reason why it is assumed that certain themes gained more popularity than others over time. The studies of Alan Chong were focused on the higher price categories, based on private inventories. Since private inventories from the Republic were the source for the displayed chart, no information is available about the prices paid or popularity of certain genres with foreign art buyers.

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54 North, Michael, and Catherine Hill (1988), p. 98-100
Information about the prices paid for some of the sold works is recorded in the Getty database in the period between 1670 and 1700, but it is uncertain how these should be interpreted. Besides, research concerned the number of paintings made and the prices paid is covered by both Montias and Marten Jan Bok already.\footnote{Montias, J. Michael (1987), p. 455 - 466.; Bok, M.J. Vraag en aanbod op de Nederlandse kunstmarkt, 1580-1700, Utrecht: University of Utrecht, 1994, p. 100-120.} What can be done is to plot the number of works in a specific genre sold at the public art sales covered in the database to achieve a similar overview as in figure 10. Since these are public art sales, portraits were not commonly sold at these events and oftentimes stayed in the family. Because of this, public art sales, even though retrospective in nature, serve as a good representation of the popularity of free market wares. Unfortunately, the database provides no information about the genres of the recorded sales.

Therefore I filtered the database on certain keywords myself to derive a sample of the genres in the database. Very few works have a determined title, but contain a simple description of the pictured subject or scene, like ‘Landscape with trees’ or ‘Scene with farmers’. Using a few distinctive keywords for the different genres produces the bar chart of figure 13. Naturally, using just a select amount of keywords would barely touch on the majority of these records.

Figure 13. Overview of total sales in the Republic in the period 1676-1739.
To continue on this idea, it would be useful to develop an algorithm that can derive the genres from the keywords in the title. As a start, the algorithm can be based on simple rule-based machine learning, which would entail that an extensive set of rules must be created for the algorithm to follow. For example, to cover religious paintings, scenes with Christ, Mary or saints and biblical stories, locations and allegories should be defined. When the algorithm reads over a title of a painting in the database and encounters a keyword that is related to a certain genre, the algorithm could classify that painting within that specific genre, which can be done in a separate file or other database.

It has to be taken into account that for many records, the description of the subject of the depiction is lost, because these are recorded as ‘ditto’, when multiple similar scenes were bought at the same time. Montias encountered another problem with the way notaries and other people recorded the works in inventories: many general terms were used for vastly different topics. Some biblical scenes are mistakenly recorded as landscapes, for instance, and the many differences in recordings of natural language make it difficult for a simple rule-based algorithm to process the database. Ideally this algorithm would need to be self-learning with different forms of input, for example the differences in early modern Dutch writing.

The two genres with the most records (that can be derived) are the landscapes and marines. The key word ‘landscape’ is a commonly used and meaningful term, without too many synonyms. For the marines, the database was searched on the key word ‘zee’ (sea) in any form, since in Dutch many nautical themed words contain the word ‘zee’.

Figure 14 (left). Sample of sales of landscapes and marines. Figure 15 (right). The same sample plotted against the total of sales in the period 1676-1739.

This is why these two genres generate the most hits in the chart in figure 11. Those samples are used to plot trends over time, as seen in figure 12, but plotted against the total of recorded sales (fig. 13), the derived numbers of the landscapes and marines are almost negligible. Therefore, I will not continue on examining genres in this thesis further on, since I feel these findings are not reliable (yet), and would require extensive (automated) annotation first.

**Shifting perspectives 2: Zooming in on the connection between England and the Republic**

Since the dataset on the Republic did not return the desired results, I shifted to the recorded sales for Dutch artworks in England for the same time period as before. Naturally, the reign of William III as king of England, Scotland and Wales is in itself reason enough to look at this dataset, but the Dutch painters active in England and the mentions of the British painter and art dealer Robert Griffier as a buyer and the Duke of Norfolk Henry Howard (for the collection of Thomas Howard) as a seller in the Republic’s dataset serve as additional motivations to look into the contents of the sales in England in the late seventeenth-century.

The graph in figure 14 shows the total of Dutch sales between 1670 and 1740 in blue, plotted against the amount of Dutch works sold in England in the same period in

![Graph](image)

Figure 16. The total sales in the Republic plotted against the sales in Dutch artworks in England in the period 1676-1739.
orange. The English dataset contains 8820 unique records. The first thing that stands out is the big peak of sales of Dutch artworks in England in 1690 and 1691. This seems to be related to the crowning of William. To get a better understanding of this sudden peak and how this was related to William III becoming king of England, Scotland and Wales, I will look at these contents and sellers in more detail as well.

Mapping which artists were sold in these years could tell us more about the nature of the auctions. Do these auctions concern mostly old masters, or are contemporary artists sold as well? When there is a considerable amount of contemporary artists visible, it could mean that there was an international appreciation of contemporary Dutch artists.

<table>
<thead>
<tr>
<th>Artist (British Sales)</th>
<th>Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anonymous or unknown Dutch Master</td>
<td>2022</td>
</tr>
<tr>
<td>Van Heemskerck (unsure)</td>
<td>1374</td>
</tr>
<tr>
<td>Van der Velden (most likely sr. 1633 - 1707 or jr. 1672 - 1717)</td>
<td>401</td>
</tr>
<tr>
<td>Van Diest (most likely sr. ca. 1631 - ca. 1677 or jr. 1655 - 1704)</td>
<td>305</td>
</tr>
<tr>
<td>Rembrandt van Rijn (1606 - 1669)</td>
<td>278</td>
</tr>
<tr>
<td>Jan Griffier (most likely sr. 1645 - 1718 or jr. 1698 - 1773)</td>
<td>208</td>
</tr>
<tr>
<td>Knife or Knijff (most likely Wouter Knijff 1605 - 1694)</td>
<td>191</td>
</tr>
<tr>
<td>Pieter van der Elst (1608 - 1675)</td>
<td>191</td>
</tr>
<tr>
<td>Philip Wouwerman (1619-1668)</td>
<td>185</td>
</tr>
<tr>
<td>Nicolaes van Berchem (most likely sr. 1621 - 1683 or jr. 1649 - 1672)</td>
<td>175</td>
</tr>
<tr>
<td>Adriaan van Ostade (1610 - 1685)</td>
<td>147</td>
</tr>
<tr>
<td>Bloemaert (most likely sr. 1566 - 1651 or jr. 1609 - 1666)</td>
<td>144</td>
</tr>
<tr>
<td>Gerard Edema (ca. 1652 - ca. 1700)</td>
<td>125</td>
</tr>
<tr>
<td>Sailmaker (most likely Isaac Sallmaker/Zeilmaker 1633 - 1721)</td>
<td>123</td>
</tr>
<tr>
<td>Roestraten (most likely Pieter Roestaten 1630 - 1700)</td>
<td>115</td>
</tr>
<tr>
<td>Hondius (unsure)</td>
<td>105</td>
</tr>
</tbody>
</table>

Figure 17. Overview of Dutch painters mentioned for British sales in the period 1676-1739.

The numbers shown above are a mere indication, since not every row provides us with a distinguishable name. Some surnames are not spelled correctly and many first names are missing, which are needed to determine the painter concerned. I manually clustered the top fifteen most mentioned (sur)names in the file. For the cases where it is not clear who the exact painter is, I provided the most likely matches. Since the occupation of a painter
was often passed on from father to son and, moreover, father and son often shared the same first name, these results can get confusing. Some family lines do contain masters from before 1676 as well. The database would need more annotations and information from the source files to get more accurate numbers. There are more reasons why these assigned names are problematic to work with, I will get into this later.

Interesting names that can be derived from the table, aside from the accuracy of the numbers, are among others: Roustraten, Sailmaker (Zeilmaker), Knijff, the old Griffier, members of the Hondius family and the Van Diest family, since the careers of these men mostly took place in England. On the other hand we see ‘old masters’ (meaning a substantial part of their career took place before 1670) like Rembrandt, probably the old Van Heemskerck, Ostade, Wouwerman and Van Berchem.

What can we take away from these results? Art auctions in England were not as developed as in the Republic in the seventeenth-century, the first documented auction in London for instance took place in 1672. First-hand accounts of visitors to these first auctions refer to the ‘Dutch manner’ of bidding on the lots, which was executed per outcry. This means that while the English auctions were still in development, the English elite was familiar with the Dutch auctions, where a part of the old masters circulating in the English auction scene could have originally been bought.

According to David Ormrod there were still severe import restrictions at play at the end of the seventeenth-century, of which the Act of Navigation was the most infamous. This specific act restricted the entrance of foreign merchant ships in the English ports and imposed import high duties for certain goods. However, this act restricted the import of goods, like spices and coffee, from foreign colonies, which was a major financial setback for the Republic, that profited greatly from their colonies. Ormrod mentions that these types of restrictions were also formally implemented for the import of foreign paintings during the Puritan reign of Cromwell but in reality, these restrictions seldom led to an actual refusal by customs authorities. It was not until 1695 that these restrictions were officially lifted, but in turn, high import duties were applied to these luxury goods to benefit the state. Ormrod suggests that no one other than King William III himself was responsible for the rise in taxation on imported paintings, because the state treasury was rapidly running dry due to expensive wars waged by William III on different fronts, so he could use the funds immediately.

The effect of the increased import duties is not visible in figure 14, obviously the chart is concerned with auctions and not imported art directly. While on paper restrictions


for the import of paintings was in effect, but in reality very few paintings were refused by customs authorities and according to the chart of figure 14, many Dutch paintings found their way into England. Many Brits were hesitant of the Dutch stadholder crowned as their king and they suspected that he would declare the Act of Navigation ineffective in favour of the merchants in the Republic. In regard to the import of foreign paintings, and Dutch paintings in particular, he did not change anything about the active regulations until 1695. Therefore, a change in import regulations was not the reason for the peak in sales of Dutch artworks in 1689 and 1690. At the end of the century the demand for paintings in England exceeded supply, much like the situation of the art market in the Republic in its glory days. There was an established and growing elite in England at the time, providing many opportunities for painters. Since the supply of paintings was not on par with the demand, foreign painters were welcome to meet this demand. A fair share of the recorded artworks in the dataset concerning English sales of Dutch works was made by contemporary Dutch artists who were active in England. The immigration of foreign artists was considered to have a positive effect on the English art market, not only because they would attribute to the demanded supply for new art pieces, but it was believed that (ideally) these artists would pass on their skills to native artists. Ormrod states that the Treasury Books of the seventeenth-century suggest that the Dutch artists who settled in England after the Year of Disaster brought in large quantities of paintings, both self-manufactured pieces and when applicable, their own art collection. Obviously many Dutch artists

<table>
<thead>
<tr>
<th>Period</th>
<th>Dutch painters active in London</th>
</tr>
</thead>
<tbody>
<tr>
<td>1550 - 1600</td>
<td>14</td>
</tr>
<tr>
<td>1600 - 1650</td>
<td>51</td>
</tr>
<tr>
<td>1650 - 1700</td>
<td>96</td>
</tr>
<tr>
<td>1700 - 1750</td>
<td>56</td>
</tr>
</tbody>
</table>

Figure 18. Numbers of Dutch painters active in London (source: Ecartico).


61 Available at: http://www.vondel.humanities.uva.nl/ecartico/analysis/?task=origin, consulted 06-08-2018.

traveled to England some years prior and after the Year of Disaster, facing bankruptcy or general financial decline, reflected in the relatively high numbers of painters active in London in the period between 1650-1700 in figure 18.

So far, there is not a direct reason why such a peak of listed Dutch artworks at public art sales in 1689-1690 is observed. To gain more insights into the nature of these art sales, I will look at the sellers next, as done before with the results from the Republic’s dataset. The table below (fig. 19) shows the recorded sellers in the mentioned 4 years. Most records unfortunately have anonymous sellers.

<table>
<thead>
<tr>
<th>Year</th>
<th>Seller</th>
<th>Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>John Maitland, Duke of Lauderdale (1616 - 1682)</td>
<td>7 occurrences</td>
</tr>
<tr>
<td>1690</td>
<td>Mr. De Ryck</td>
<td>679 occurrences</td>
</tr>
<tr>
<td>1691</td>
<td>J.D.</td>
<td>248 occurrences</td>
</tr>
<tr>
<td></td>
<td>Monsieur Le Vince</td>
<td>140 occurrences</td>
</tr>
<tr>
<td></td>
<td>Cardinal Antonio Barberini (1607 - 1671)</td>
<td>100 occurrences</td>
</tr>
<tr>
<td>1692</td>
<td>Prince Ludovico</td>
<td>175 occurrences</td>
</tr>
</tbody>
</table>

Figure 19. Overview of sellers of Dutch artworks in England in the period prior to 1702.

Mr. De Ryck has the most occurrences in the dataset with 679 recorded sales. This auctioneer was also noticed by Brian Cowan, saying De Ryck promoted ‘several of the best masters, now living in London’. The only match found in the RKD database for this surname is the Flemish Willem de Ryck (1635 - 1682), who was active as an etcher, painter

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and goldsmith in London from 1682 till 1699, but it is uncertain if it this concerns the same person. Further information about Mr. de Ryck or Willem de Ryck is not available.64

One of the other sellers were two members of the Maitland family. John Maitland was a Scottish politician and the councillor of King Charles II, and after the restoration of the monarchy, he made it his main cause to ensure that the nation of Scotland, were many Jacobites resided, stayed obedient to the crown and at the same time increase his own power. Richard Maitland, also mentioned as a seller, was his nephew. But unlike his uncle, Richard was an avid supporter of the Catholic Stuart dynasty, and after the assignment of the crown to William III after the revolution, he became an exile.65

Comparing the results of the Getty database with the announcements of public art sales from the London newspaper in the seventeenth-century (available via the British Library archives) gives some more data on the sellers and marketing. In 1689, a total of 434 sold paintings are recorded in the database, spread over 17 separate sale dates. The British Library archive contains 24 announcements in the category art auctions for this year.66 This discrepancy between the number of recorded sale dates and announcements are most likely caused by double entries. Several mentioned names are also seen in figure 19, like Richard Maitland and Antonio Barberini (which is mentioned for several different years). Another name is Edward Millington, who was one of the first organisers of art auctions in the period following on the Restoration, and returns multiple times in both the archive and the newspaper announcements.

The number of recorded sales for 1690 was six times as many as the year before, with 2744 paintings offered on 23 different sale dates and 45 announcements. In the database, only the seller Mr. De Ryck is returned, but in the announcements we find more people that were involved. Again, Millington is mentioned as auctioneer for 11 sales, but similar auctioneers like Benjamin Walford and John Bullord are brought up. One sale was organised by the so-called Outropers office, which was an institution handling and selling the inventories of deceased inhabitants of London and bankruptcies. Their proceeds went to the local orphanage, as similar to the Amsterdam ‘weeskamerveilingen’. Only this institution had the legal permission to sell per auction, but this did not stop auctioneers like Millington to organise their public art sales and they encountered barely any resistance, as shown by the scale and consistency of the art sales in

64 As described in the RKD Database: https://rkd.nl/explore/artists/69096, consulted on 06-08-2018.
1690 and 1691. In the list of public acts, passed from the Revolution in the year 1688 to the Accession of Queen Anne, in the year 1701-1702 no traces of legislation against art auctions not performed by outropers. For 5 sales one ‘Ferdinando Verryck’ is mentioned, for example in this announcement for part of the collection of Sir Peter Lilly, who was a renown art collector:

At the west-end of Exeter Change, a curious collection of three hundred and odd paintings, being most originals by the best masters in Europe, some of Sir Peter Lilly, some of Mr. Wyck, some of Mr. Edema, some of Mr. Monthingo; with several fine copies by very good hands. Will be sold by auction, or who bids most, on Thursday and Friday the 19th. and 20th. of June, 1690, at three of the clock in the afternoon. By Ferdinando Verryck.

It is notable that the surname ‘Verryck’ is similar to ‘De Ryck’. For many of the painters’ surnames noted in figure 17, the multiple spellings of the names in the database had to be manually clustered under one label. For example, the famous Dutch painter Johannes Vermeer, as he is known today, was written down in the sales catalogs as ‘Jan van der Meer’, ‘Van der Meer van Delft’, ‘Jan Vermeer’, etc. Both names ‘Verryck’ and ‘De Ryck’ bear similarities, but they also both organised their sales at the same location, this being ‘the west-end of Exeter Change’. Thus, it could very well be possible that these sales concern the same person as auctioneer, which would change the number of attributed sales per seller. Another announcement gives some more information about the scale of the auctions:

At the Kings Arms Tavern, over against St. Clement’s-Church in the Strand, will be sold by way of auction, a curious collection of original paintings, and other fine copies, formerly belonging to a person of quality. The sale will begin on Thursday next, being the 16th of October, exactly by three of the clock, and will continue the following days until all be sold; the whole collection containing about 300 pieces. As also a collection of about 2000 prints, drawings, and draughts of tombs, and 26 books of prospective, which were the collection of Mr. Boarman sculptor; which will be exposed to sale on Saturday next.

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The quote above, taken from one of the newspaper announcements for an art sale by an anonymous seller in the same year, makes it clear that not only paintings, but also a broad selection of drawings, prints and books were sold at these auctions. This particular quote is interesting because of the numbers of paintings and prints mentioned. Art prints are not taken into account in the Getty Provenance Index database, and thus are not the reason for the peak in sales, but the trade in (and collection of) art prints must have been excessive as well in this period in time.

The following year, 1691, there was still a large number of records in the database, with 2067 total paintings sold, spread over 50 different sales dates, and announced in 44 newspaper articles. The large number of sale dates implies that the popularity of these auctions was rising, and that is understandable when these auctions were often seen as important social events, for some the social aspect and showing off the amount of money they bid on paintings was more important than the art pieces themselves.71

In the announcements, the names of Millington and Bullord reoccur and one announcement that stood out to me was the following:

A choice collection of valuable paintings most of which are originals; by the best ancient and modern masters, viz. Old Boon, ... Old Knyfe; will be sold by auction at Wills Coffee-house, at the west-end of the Court of Requests, over against the Painted Chamber, near Westminster-hall; on Tuesday the 10th of this instant November, 1691. The sale beginning at nine in the morning. By John Bullord.72

This announcement reveals that a painter like the Old Knyfe, or Wouter Knyf, was marketed as a modern master, a painter who was only active during the period of English Restoration exclusively in the Republic, and thus his work must have been imported by contemporaries. The auction also is a ‘choice’ collection, meaning that Bullord curated the collection he wanted to sell. This means that the English auctions at this point were developed from handling inventories of the deceased to professionally organised and curated collections, with the possibility that the auctioneer (or other represented art dealers) imported artworks for his auction himself. The following announcement shows how some of the paintings were marketed:

A curious collection of paintings, by the best masters, ancient and modern: fit for chimneys, stair-cases, halls, ladies closets, &c. Will be sold by auction (or who bids most) on Wednesday, the 21st of this instant January, 1690, at three in the afternoon exactly, and the following days, at the King’s-Head Tavern in Ratcliff Broadstreet, near the Cross. By John


Almost all auction announcements contained marketing language like ‘the best masters of Europe’ and the most renown painters of a collection were definitely mentioned. A large number of paintings circulated the London auction scene and as seen in this announcement, a part of these paintings were implied to decorate the ladies bedroom or the hallway. Read between the lines, this particular auction did not concern the top of the bill, but were meant as mere house decoration.

In this particular case it is made clear what the visitors of this auction could expect to see. But one of the major problems with these auctions is the attribution of artworks to certain painters. It is clear that the English elites and bourgeoise were intrigued by the Dutch masters, and ideally sought after original paintings:


But a lot of scenes deemed as old or contemporary masterpieces and successful scenes were often copied by popular demand, which has the consequence that the untrained eye would not be able to distinguish the fake painting from the original. The recent Restoration of the monarchy after a Puritan dictatorship allowed the English elite and upcoming middle-class to immerse themselves in a lush lifestyle with art pieces of international appeal. The London auction scene only started in 1672 and as seen by the chart of figure 16 and the sale of Dutch art pieces only started in the 1680s. Not a lot of connoisseurs of the Dutch art were present yet at that time. Later, when people gathered more knowledge about the Dutch art and masters, lots were examined and authenticated before going into the auction. The sold collection of cardinal Barberini, for instance, is one of the few cases that the authenticity of the works is not questioned today, because a prestigious man like him was able to acquire authentic pieces. To conclude, there was a huge demand for art and it can be argued if the English buyers were concerned about the authenticity of the paintings they bought or if they just wanted decorative scenes for their houses. But this does raise questions about the number of attributions per painter as seen in figure 17.

To answer the question to what extent the reign of William influenced the sales of Dutch artworks in England is it also important to address his popularity as the English king. After James II was deposed and the crown was passed to William III, he became head of three nations heavily divided by religion and recent events. While the victory on James II was deemed as a ‘Glorious Revolution’ by the Protestant population, the morale of the

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Catholic following was obviously severely dented by the exile and fleeing of James II to French. Thomas Howard and Richard Maitland are examples of Catholic men in high positions with art collections that were auctioned in the period of William’s reign. In the case of Howard, the auctions took place after he fled the country and died. The collection of Maitland, however, was sold per auction in 1689, which was before he sided with James II at the Battle of the Boyne whereafter he fled to France. Though we do not have any additional information about the nature of this auction, which could have been for financial reasons or political, for Richard Maitland was an outspoken supporter of the deposed James II.  

At the beginning of his reign, William accepted the Declaration of Rights in 1689, which meant that taxes were collected with more efficiency to benefit the activities of the state and the legislative and executive institutions would independently operate from each other. And most importantly, it was established that a Catholic monarch would never be allowed on the English throne in the future. Which in turn leads me to believe that it is not unthinkable that Maitland would get rid of his collection for political reasons.  

England became a constitutional monarchy, opposing the French absolute monarchy. In 1694, William founded the Bank of England, and consequently, with all these measures, William established the future position of England as the world’s biggest trading and naval power. But not all members of the parliament were thrilled with their new monarch. Many of the problems discussed in the parliament concerned the conflict in interest between England and the Republic. In 1689, the English parliament discussed whether the demand by the Dutch government for a fixed payment of 600,000 pounds for the aid of William III and the Dutch troops in the deposing of James II was fair. But with the years, and with more and more taxes collected for the war with France and conflicting financial interest between the two countries, and after the death of Queen Mary in 1694, the English grew more sceptical about the Dutch sovereign and the involvement with the Republic:

We see our good coin all gone and our confederates openly coining base money of Dutch alloy for us. We see most places of power and profit given to foreigners. We see our confederates in conjunction with the Scots to ruin our English trade. We see the revenues the crown daily given to one or other who make sale of them and transmit their estates elsewhere. We do not find any of them buy lands or estates amongst us but what they can get from us they secure in their own country. How can we hope for happy days in England when this great man and the other though naturalized are in the English and also in the Dutch councils.

Fragment of the speech of Mr. Price against the Grant to the Earl of Portland (1695).

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27 Cobbett, William. (1702), p. 985
This quote shows that the English were concerned about the duality of the reign of William III and the Dutch governors, but it also brings up an important point often overlooked in literature: the exchange rate of the English pound and the Dutch guilder. In 1680, the Republic minted a new union-wide coin, and this new coin was a silver-alloy coin, just like the English pounds and shillings at the time. International trade was possible by an accepted silver of golden standard, but required moneylenders and changing offices for the different currencies dealing with different alloys and grams of coins. The pink line in the graph of figure 20 shows the rate of the guilder against that of the pound. To understand the graph: when the line hits the 100.0-mark on the y-axis, it means that the two coins are identical in value in that year, which happened in the nineteenth century when the Netherlands adopted the golden standard, which England had already adopted in the eighteenth century. In the seventeenth-century, the value of the guilder was worth less than the pound, and the consequence was that when the English parliament had to make fixed payments to the Dutch Republic, as the one described above, the Dutch actually profited of that, because the pound was a more valued currency. Why is this relevant? The other side of the story is that the English were able to buy Dutch goods relatively cheaper than in their own country, and on top of that, the relative prices for Dutch goods were already cheap in comparison, due to the economic decline at the end of the seventeenth-century. The purple line in figure 20 shows that the relative prices were almost at the lowest point in the 1680s.

Figure 20. The rate of the Dutch guilder and British pound plotted against the relative prices of wares based on Posthumus’ Amsterdam stock exchange data and ECB archive. (Source: C. de Vries)
It is plausible that this attractive exchange rate and relatively low prices for the Dutch goods in the 1680s were a good motivation for the English buyers to import art at that specific point in time, and when the demand for new art pieces grew, and the London auction market developed, these collectors could earn a decent price for their imported Dutch paintings. In 1695, William III repealed the official ban on importing foreign paintings, and introduced high duties (20%) on imported paintings. This new tax, together with a growing understanding of the differences in quality of the Dutch masters and the many copies and the rise in the relative price of the Dutch goods, as seen in figure 20, would explain why the number of sold Dutch paintings after 1691 declined immensely.

This could be further explored through further research on the prices paid for the Dutch paintings in this period by investigating private inventories or other source material like documents on duties paid or export of goods from the Republic before 1688, if available, since the Getty database provides hardly any information about the prices paid.

Collectors of Dutch artworks in other European countries
It is established that there was a massive interest in Dutch paintings in England, but what about the collectors from other European countries?

As seen in figure 21, there seems to be that there have been sales of Dutch artworks in this period in Germany, unfortunately, many paintings in this dataset are misattributed and

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concern mostly Italian paintings instead of Dutch paintings. Besides, there just a few data points for this period, which is why the database is not sufficient to work with to observe the trend in Germany in this time period. Figure 22 shows that the French collectors, possibly influenced by a boycott similar as William III had set up in England, were not really involved with buying/selling Dutch art pieces in this period, and as well as for Germany, there is a minimum of data points for the French sales as well.

Everhard Korthals Altes wrote an extensive chapter in his book on the international spread of seventeenth-century Dutch painting in the period of 1700 to 1760, with a few early accounts of French collectors from before 1700, but the chapter is mainly about German elites. Korthals Altes describes the collections of three German noblemen, however, the core of their collections was formed after 1702. The contents of these collections are probably not influenced by the reign of William III, but there is a chance that these noblemen acquired some pieces from the collection Stadholder-King in 1714 at the posthumous auction.80

Figure 22. The total sales in the Republic plotted against the sales of Dutch artworks in France in the period 1676-1739

It is also noteworthy that there were a few Scandinavian elites in the eighteenth century who collected Dutch masterpieces as well. In figure 23, the sales of Dutch paintings in Scandinavia is plotted, the main part of this graph is formed by an art sale of the collection of Karel van Mander (II or III), active in Denmark. This concludes that the English were

the first to embrace the distinct Dutch style in the art in great volumes, much later followed by the rest of Europe.

Figure 23. The total sales in the Republic plotted against the sales of Dutch artworks in Scandinavia in the period 1676-1739
Conclusion

First of all, based on the results of the Getty Provenance Index Database, it is hard to draw conclusions because of the nature of the database. The records for the Republic in the time period between 1670 to 1702 concern mainly auctions and not dealer stock books or records of painters themselves, which only sheds light on a fraction of the Dutch art market. While it can be said that there is growth in the graphs observed concerning the Republic in this period, the art sales mainly concern the collections of deceased collectors or bankruptcies, instead of professionally curated art sales. Curated art sales would actually give some insight about the trends in the contemporary art market (assuming that art pieces made by contemporaries would circulate on the art market again fairly quickly). The main flaw of the database, or the original source material, is that any information about buyers at these public art sales is not recorded. Thus, it is not possible to give any absolute answers on the question whether (or not), and to what extent, the international politics of William III attracted foreign buyers to the Republic.

For the Hague, this database does not seem to be the right source to investigate the supposed metropolitan appearance of this city under the reign of William III and the effects on the local art market, due to a very limited amount of data. Other facets of the art scene of The Hague could have been dealing with foreign buyers, like the described weekly market on the Binnenhof where artists would sell their paintings. Painters from other cities were prohibited to sell their works on this weekly market, as prohibited by the local art guild (Lucasgilde), which could be a good indication that this particular market was attractive for business, apart from the commissions from the local elite. It is established that foreign diplomats came to the Binnenhof to visit the Staten General. It can very well be assumed that they would encounter this market. On the other hand, it must be noted that William III rarely returned to the Republic after his crowning, and while the palace at Het Loo was still in full operation, he did not have his permanent residence here. Most affairs were handled at his office in England.

Amsterdam, being the biggest city of the Republic, naturally offered many different options for potential buyers to come in contact with contemporary art aside from auctions, not traceable in this database, as stated in the first chapter. The recorded auctions in this period mostly concern local or unknown sellers, of which the intent of the auctions is not certain, but among the results from the Amsterdam database is the first clear indication that a foreign collector was active on the Dutch art market. This is presented by the auction of Thomas Howard’s collection by his grandson. While the recorded works in this auction were bought in the first half of the seventeenth-century, it can be assumed that the
collection paintings of respected names must have attracted the attention from buyers from all over Europe.

Because it was already stated by both Ormrod and Rasterhoff that paintings made at the end of the seventeenth-century were not intended for the art market of the Republic but for export, I found it interesting to shift the scope to the English art sale records. There are many factors that might explain, or have jointly caused, the peak observed concerning the number of sold Dutch artworks in England. After the Restoration, the English economy grew and people gathered more disposable income, and the middle-class became larger. This, in turn, had the consequence that the demand for paintings and other forms of luxurious house decor surpassed the current supply, and because there were no immediate repercussions for importing Dutch paintings in this period, Dutch painters migrated to England and a considerable amount of imported artworks found their way into the English collections. The exchange rate of the guilder, on top of the already relatively low prices for Dutch goods, made it extra appealing to import from the Republic. It can not be traced from the database whether the most popular types of paintings sold were adapted to a changed and/or foreign audience. For example, the Italianate pieces were a popular and cheap alternative to the authentic Italian masters, and not to mention, the paintings from the Republic were not "popish".

It is difficult to say whether English auctioneers directly imported art pieces with the goal to sell these in a curated art sale for a profit, but it is definitely possible. However, the peak in the English sales for the years 1690 and 1691 do not seem to have an effect on, or relate to, the total of art sales in the Republic in those years. In any case, in 1688 there were enough works imported and made by Dutch painters active in England to have these works be sold in organised auctions. Even though these auctions were technically illegal, judging by the constant amount of organised auctions, publicly announced in the local newspaper and the lack of proof that there was legislation against these types of auctions, makes me believe that these were tolerated to a certain extent, just like the import of foreign paintings before the legalisation in 1695.

With the crowning of William as king of England, Scotland and Wales, England and the Republic had to shift their attention collectively at their shared enemy in France. The deposition of James II made that William III was appreciated among the Protestant supporters, but with the ongoing war with France, financed by the collected taxes from the English people, and the growing assumption that William III’s politics were biased towards the Republic, the appreciation turned into scepticism. Together with the introduction of the high tax of 20% on imported paintings in 1695, this scepticism seems to be the reason why after 1691 the number of sales of Dutch paintings drastically decreased. One factor that also seems to tie into this is that over the years, more knowledge about the varying quality of the Dutch paintings was acquired. Collectors became connoisseurs of the
masters of the seventeenth-century, which meant that wrongly attributed paintings and copies quickly decreased in value and popularity.

The fact that these auctions were viewed as important social events and knowledge of the quality of these paintings was still at a minimum, lead to two-year craze which collapsed as quickly as it emerged.

This would not have been possible if William III was not crowned as king of England, Scotland and Wales, his reign secured peace between England and the Republic and he established the position of England as biggest naval and trading power of Europe in the future. The economy of England was thriving during his reign and resulted in a flourishing middle-class. Dutch painters migrated to England before 1672, but at the end of the seventeenth-century this became even more lucrative. After 1700, the number of painters active in London decreased as well as the number of sold Dutch paintings in auctions, which supports the assumption that William’s reign did have a direct positive effect on the livelihood of contemporary Dutch artists in England and Dutch paintings circulating the English auction scene.

However, to say that the reign of William III had a positive effect on the art market in the Republic itself is more difficult to prove. Again, the database in its current form is not the best source material to answer this question, which leads me to the following points.

Annotation and thorough cleaning of the database is required to get more accurate results. Problems like the mentioned sale by Cornelis van Dyck in the Hague in 1713, where the database returns almost 150 copied records of one particular sold painting distorts the research results and conclusions based on these results. While data analysis can be used to provide a view on history in absolute numbers. These types of inconsistencies are the biggest challenge while working with these types of databases. Detailed screening of the contents throughout the research is required, which is time-consuming in itself and somewhat contradictory, but needed to prevent faulty results and interpretations. Nevertheless, it needs to be said that databases like the Getty Provenance Index Database and the methods used to visualise the contents offer a different and exciting way of handling research material and, more often than not, forces the challenges faced to be tackled with creativity and a change of perspective to gain new insights.

Sophie Raux concluded in her article on the methodological challenges that the traditional art historian is challenged to back their statements up with data and the computer scientist and data analyst are challenged to deal with uncertainty. From this thesis the same conclusion can be drawn: the gaps left by the data have to be filled in with human logic and funded speculations, something that can not be thought to an algorithm.
Throughout this thesis, I proposed several options for further research, but the one I am most interested in myself is the possibility to automate the annotation of the genres of paintings in this database by filtering on certain keywords in the given titles. As mentioned before, a separate, extensive dataset would be needed with keywords that match a certain genre. For example, titles of scenes that would be annotated as a typical Dutch ‘genre’ paintings, would contain keywords like ‘farmers’, ‘dance’, ‘drunk’, etc. Applied to the database for works sold in the Republic, but also in England, this method would provide a broad view of the specific genres that were popular throughout the seventeenth and the beginning of the eighteenth century, revisiting the research by Alan Chong and Michael North with a bigger sample of source material to work with.
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Dictionary of National Biography, 1885-1900, Volume 28, p.73-76.

Elgammal, Ahmed and Babak Saleh. “Quantifying Creativity in Art Networks” *CoRR,* (June 2015)


Consulted databases

British Library English Short Title Catalogue
http://estc.bl.uk/

RKD Nederlands Instituut voor Kunstgeschiedenis
https://rkd.nl/nl/

Ecartico
http://www.vondel.humanities.uva.nl/ecartico/

Getty Database Provenance Index
http://www.getty.edu/research/tools/provenance/search.html
https://github.com/thegetty/provenance-index-csv

Lugt database online.
http://tl2.idcpublishers.info/content/aboutlugt.php
Appendix: Database processing log

Downloaded the database from the Getty Provenance Index Github (https://github.com/thegetty/provenance-index-csv). The database consists of sales catalogs, which can be found as 13 separate csv-files. The sales catalogs dataset includes data on sales by auction houses and dealers. The Netherlands is covered from 1671-1740. Additional info about the contents of the sales catalogs is added in a file called ‘sales_description.csv’, the dataset with information about the original source files can be found in the file sales_catalogs_info.csv, that is also provided on the Github of the Getty Provenance Index. The Github of the Getty Provenance Index Database provides 13 files without an index of where to find what. I downloaded them all and opened the first csv.file in Excel to get familiar with the contents of this database. I then quickly discovered that there are a lot of different columns in the header row. I installed the csvkit toolkit for unix and entered the following command:

$csvcut -n sales_contents_1.csv

This command shows and numbers the column titles at the beginning of the csv-file, to get a quick overview of the column contents. The dealer stock books consist of 480 (!) columns. The sales are annotated and sorted in the first row by country. The github descriptions do not mention in which file the mentioned countries are covered, I scrolled through them all get a grip on the annotations used. The only records I need to look at are annotated with ‘DUTCHSALES’. I searched through the 13 files to see in which files the Dutch sales were represented with the following command:

$grep -o -i DUTCHSALES sales_contents_1.csv | wc -l

I repeated this for all the 13 files, the results returned that there are 43021 values in sales_contents_7.csv and 7033 in sales_contents_8.csv. But these were just fractions of the total of rows in these files.

$cat sales_contents_7.csv | wc - l
$cat sales_contents_8.csv | wc - l

These commands return that there are a total of 10001 lines for the sales_contents_7.csv file and 9999 total for the sales_contents_8.csv file. When opening the first file mentioned, the first lines are annotated with ‘BRITISHSALES’, which meant that I had to cut the ‘DUTCHSALES’ lines from both files and save these
to separate files. I kept them separate, because at this point I was not sure what the contents of both files were and I did not want to join them already with the possibility of one very messy file.
I used the following command:

```
$awk -F, '$1 ~ /DUTCHSALES/ {print}' sales_contents_7.csv >
dutchcontentsfile7.csv
$awk -F, '$1 ~ /DUTCHSALES/ {print}' sales_contents_8.csv >
dutchcontentsfile8.csv
```

These commands also delete the first line with the column headers. I used the csvcut command again to cut and number the column headers from the origin file and pasted these into a separate file for quick reference later, when selecting the relevant columns.

```
$csvcut -n sales_contents_7.csv > column_headers_7.txt
$csvcut -n sales_contents_8.csv > column_headers_8.txt
```

Using csvkit to look at the different columns contents, it returned that the csv-files are read wrong, it appears it is read as if all the contents of the rows are placed into the first column. Upon looking into the files, the absence of whitespace, underscore or '/' NA’ to mark that some values are empty makes that the csv-file is read wrong. I used the following command to mark these values as empty (by using an underscore).

```
$cat dutchcontentsfile7.csv | awk '{i=0;while(i++<2)
{gsub(/,,/,"_","");gsub(/ /,""})}1' > salescontents7edit.csv

$cat dutchcontentsfile8.csv | awk '{i=0;while(i++<2)
{gsub(/,,/,"_","");gsub(/ /,""})}1' > salescontents8edit.csv
```

Using csvkit to look at the stats of the first csv-file again, the columns are now read correctly. I manually cut and pasted the first row with the column headers in these two files from the original sales contents .csv-files.
The second file gave me some error messages about the encoding, resulting in processing only the first 30 lines instead of the whole file. I fixed this with the following commands:

```
$iconv -f ISO8859-9 -t UTF-8 salescontents8edit.csv > salescontents8edit.csv
$csvcut -e utf-8-sig -c 1,2,3 salescontents8edit.csv | csvstat
```

It then returned the stats of requested columns for all the 7033 lines in this file, as it should.
At this point I cleaned up my Admin/root file, putting all the backup files in one separate file, keeping only the cleaned up files that I wanted to continue to work with in the root file, and rename these for convenience (‘sc7.csv’ and ‘sc8.csv’)

My following challenge was to cut the relevant range of years from these two files.
Using my reference file with the numbered header rows, I saw that the column ‘lot_sale_year’ was the fourth column. I used the csvcut command again for the fourth column for both files and got the following results:

$csvcut -e utf-8-sig -c 4 sc7.csv | csvstat
1. "lot_sale_year"

<table>
<thead>
<tr>
<th>Type of data:</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains null values:</td>
<td>False</td>
</tr>
<tr>
<td>Unique values:</td>
<td>48</td>
</tr>
<tr>
<td>Smallest value:</td>
<td>1.676</td>
</tr>
<tr>
<td>Largest value:</td>
<td>1.823</td>
</tr>
<tr>
<td>Sum:</td>
<td>77.552.469</td>
</tr>
<tr>
<td>Mean:</td>
<td>1.802,665</td>
</tr>
<tr>
<td>Median:</td>
<td>1.811</td>
</tr>
<tr>
<td>StDev:</td>
<td>29,614</td>
</tr>
<tr>
<td>Most common values:</td>
<td>1.816 (3586x)</td>
</tr>
<tr>
<td></td>
<td>1.817 (3069x)</td>
</tr>
<tr>
<td></td>
<td>1.811 (3018x)</td>
</tr>
<tr>
<td></td>
<td>1.802 (2965x)</td>
</tr>
<tr>
<td></td>
<td>1.810 (2430x)</td>
</tr>
</tbody>
</table>

Row count: 43021

$csvcut -e utf-8-sig -c 4 sc8.csv | csvstat
4. "lot_sale_year"

<table>
<thead>
<tr>
<th>Type of data:</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains null values:</td>
<td>False</td>
</tr>
<tr>
<td>Unique values:</td>
<td>41</td>
</tr>
<tr>
<td>Smallest value:</td>
<td>1.697</td>
</tr>
<tr>
<td>Largest value:</td>
<td>1.823</td>
</tr>
<tr>
<td>Sum:</td>
<td>12.185.546</td>
</tr>
<tr>
<td>Mean:</td>
<td>1.732,624</td>
</tr>
<tr>
<td>Median:</td>
<td>1.732</td>
</tr>
<tr>
<td>StDev:</td>
<td>19,315</td>
</tr>
<tr>
<td>Most common values:</td>
<td>1.739 (827x)</td>
</tr>
<tr>
<td></td>
<td>1.734 (552x)</td>
</tr>
</tbody>
</table>
It seems that the lines in these files are not chronologically arranged. The range of years of the first file is 1676 till 1823 and the second file covers 1697 till 1823. I want to cut the range to every year before 1740 for both, use csvcut to check the results. After this, I will stack the two files on top of each other and count to check again:

$awk -F, '$4 < 1740' sc7.csv > sc7select.csv
csvcut -e utf-8-sig -c 4 sc7select.csv | csvstat
1. "1684"

Type of data: Number
Contains null values: False
Unique values: 27
Smallest value: 1.676
Largest value: 1.714
Sum: 5.661.105
Mean: 1.702,588
Median: 1.705
StDev: 8,592
Most common values: 1.708 (366x)
1.713 (315x)
1.707 (255x)
1.695 (228x)
1.712 (213x)

Row count: 3325

$awk -F, '$4 < 1740' sc8.csv > sc8select.csv
csvcut -e utf-8-sig -c 4 sc8select.csv | csvstat
1. "1713"

Type of data: Number
Contains null values: False
Unique values: 34
Smallest value: 1.697
Largest value: 1.739
Sum: 11.422.977
Mean: 1.728,397
Median: 1.730
StDev: 9,123
Row count: 6609
I used the following command to check for duplicates in the first row ('persistent_puid'), which is the database ID of every row entry. The commands returned no results, meaning that there were no duplicates and each line represents an unique sale.

```bash
$awk -F, ' ++A[$1] > 1 { print $1 "is duplicate"; exit 1 } ' sc7select.csv
$awk -F, ' ++A[$1] > 1 { print $1 "is duplicate"; exit 1 } ' sc8select.csv
```

I stacked the two files on top of each other with csvstack:

```bash
$csvstack sc7select.csv sc8select.csv > sccombined.csv
cat sccombined.csv | wc -l
  9934
```

I then manually reattached the header row again to this new, stacked file, looking at csvstat, using the 4th column, to see if the results I want to see are returned:

```bash
$csvcut -e utf-8-sig -c 4 sccombined.csv | csvstat

1. "lot_sale_year"
```

<table>
<thead>
<tr>
<th>Type of data:</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains null values:</td>
<td>False</td>
</tr>
<tr>
<td>Unique values:</td>
<td>51</td>
</tr>
<tr>
<td>Smallest value:</td>
<td>1.676</td>
</tr>
<tr>
<td>Largest value:</td>
<td>1.739</td>
</tr>
<tr>
<td>Sum:</td>
<td>17.084.082</td>
</tr>
<tr>
<td>Mean:</td>
<td>1.719,759</td>
</tr>
<tr>
<td>Median:</td>
<td>1.720</td>
</tr>
<tr>
<td>StDev:</td>
<td>15,113</td>
</tr>
<tr>
<td>Most common values:</td>
<td>1.739 (827x)</td>
</tr>
<tr>
<td></td>
<td>1.734 (552x)</td>
</tr>
<tr>
<td></td>
<td>1.738 (546x)</td>
</tr>
<tr>
<td></td>
<td>1.733 (353x)</td>
</tr>
<tr>
<td></td>
<td>1.722 (352x)</td>
</tr>
</tbody>
</table>
After this step I wanted to produce some visualizations. The first being the amount of sales per year in a simple plot. Since every row is a separate sale, I could count the total of occurrences of every year mentioned in the file and plot this in a chart. I noticed that there were still rows that had more tokens at the end of each line in the stacked file, not matching the amount of tuples of the header row. To get around this problem I cut the column ‘lot_sale_year’ I wanted to plot first into a separate file with the counted occurrences and sorted these. I will have to look into the extra tokens at the end of the line later.

Put the data of the columns ‘lot_sale_year’ in the file ‘yearsales.csv’, along with the counted occurrences.

```
$awk -F ',' '{print $4}' sccombined.csv | sort | uniq -c > yearssales.csv
```

This just prints the results of the command into a csv.file, which is not separated by commas yet. I used the following commands to clean up the file into a useful comma-separated file.

```
$awk -F ',' '{print $4}' sccombined.csv | sort | uniq -c > yearssales.csv
$sed 's/ /,/g' yearssales.csv > yearssales1.csv
$ sed 's/ /,/g' yearssales1.csv > yearssales2.csv
$csvcut -c 2,3 yearssales2.csv > yearssales.csv
```

I manually edited the header row into ‘counted,lot_sale_year’. With python I could use this file to make a plot:

```
import pandas as pd
import matplotlib.pyplot as plt
df = pd.read_csv('yearssales.csv', index_col='lot_sale_year')
plt.plot(df)
plt.title('Total sales per year, 1676-1739')
plt.show()
```
This graph shows the total amount of reported sales in the Republic between 1676-1739.

Now I wanted to break down the dataset to get results for both Amsterdam and The Hague in this period of time.

I went back into the sccomibined.csv-file and looked at the contents of the different columns using csvstat. I quickly discovered that there a lot of columns, for instance the ones describing buyer and seller, that have little to no content. This is very unfortunate, and forces me to look into other ways to get the information I desire.

One of the columns that does contain useful information is the one containing information about the specific auction house where the sales records are reported (column 16: ‘auction_house_1’).

```
$csvcut -e utf-8-sig -c 16 sccomibined.csv | csvstat
1. "auction_house_1"

  Type of data: Text
  Contains null values: False
  Unique values: 10
  Longest value: 21 characters
  Most common values: Anonymous (7389x)
                     JanPietersz.Zomer (1232x)
                     Zomer(JanPietersz.) (768x)
                     Raket(Pieter) (134x)
                     Magnus(J.) (131x)
```
To get more information about the sales records and auction houses, I had to look into the dataset ‘sales_descriptions’ provided by the Getty Provenance Index. I separated the header of this file, again as a quick reference guide.

$csvcut -n sales_descriptions.csv > column_headers_description.txt

There are 64 columns in this file, and I’m interested in ‘sale_location’ and ‘city_of_sale’. The next challenge was to join the stacked sales file and the ‘sales_description’.csv-file and get more information about the location of the sales and visualize these.

As mentioned before, the end of some rows in the stacked file do not line up with the amount of columns, so there are some extra commas at the end. To work around this, I just selected the columns I am interested into a file, because I do not need all the 480 columns. Especially since most columns do not contain any content.

Because there is a column from the sales_descriptions.csv-file with “sale_begin_year”, I want to compare this column with the “lot_sale_year” column from the sales_catalogs.csv-file before selecting the columns.

$csvcut -e utf-8-sig -c 3 sccombined | csvstat

1. "sale_begin_year"

   Type of data:      Number
   Contains null values: False
   Unique values:  51
   Smallest value:  1.684
   Largest value:  1.818
   Sum:                  11.372.598
   Mean:               1.717,396
   Median:              1.717
   StDev:              15,647
   Most common values: 1.739 (661x)
                       1.738 (407x)
                       1.708 (339x)
                       1.734 (324x)
                       1.716 (311x)

$csvcut -e utf-8-sig -c 16 sccombined | csvstat

1. "lot_sale_year"

   Type of data:      Number
Contains null values: False
Unique values: 49
Smallest value: 1.684
Largest value: 1.739
Sum: 11.372.403
Mean: 1.717,367
Median: 1.717
StDev: 15,564

Most common values: 1.739 (661x)
1.738 (407x)
1.708 (340x)
1.734 (324x)
1.716 (311x)

I do not think there are a lot of differences, so I am just going to use the ‘lot_sale_year’ column.

Relevant for my topic, I selected, with the help of the counted header row guide file just the first four columns:

$csvcut -c 1-4 sccombed.csv > sccselect.csv

The same I will do for the sales_description.csv-file, because I also do not need all 64 columns.

$csvcut -c 1,57 sales_descriptions.csv > sdcselect.csv

Both files can then be joined on the column ‘catalog_number’.

$csvjoin -c 1,2 sdcselect.csv sccselect.csv > joined.csv

$csvcut -e utf-8-sig -c 10 joined.csv | csvstat

1. "city_of_sale"

   Type of data: Text
   Contains null values: False
   Unique values: 11
   Longest value: 10 characters
   Most common values: Amsterdam (6622x)
                       Den Haag (1096x)
                       Rotterdam (1018x)
                       Hague, The (304x)
                       Middelburg (286x)

The list above shows that most sales were made in Amsterdam, as expected. But Den Haag (1096)/The Hague(304) is in second place!

Good news. Now I am going to separate the rows mentioning Amsterdam
and the rows mentioning Den Haag/The Hague into separate files, and plot them again according to year.

$csvgrep -c 10 -m Amsterdam joined.csv > amsterdam.csv
$cat amsterdam.csv | wc -l
 6623
$csvgrep -c 10 -m "Den Haag" joined.csv > denhaag.csv
$csvgrep -c 10 -m "Hague, The" joined.csv > denhaag1.csv

I have to replace “Hague, The” into “The Hague” so the comma does not get mistaken for an extra column.

$sed 's/"Hague, The"/The Hague/g' denhaag1.csv > denhaag2.csv
$csvstack denhaag.csv denhaag2.csv > denhaagc.csv
$cat denhaagc.csv | wc -l
 1401

Now I have two files with the info about the total of recorded sales in Amsterdam and in The Hague.
First I plotted the recorded sales in Amsterdam:

$awk -F ',' '{print $5}' amsterdam.csv | sort | uniq -c > amsterdamyears.csv
$sed 's/ //g' amsterdamyears.csv > amsterdamyears1.csv
$sed 's/ //g' amsterdamyears1.csv > amsterdamyears2.csv
$csvcut -c 2,3 amsterdamyears2.csv > amsterdamyears.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>df = pd.read_csv('amsterdamyears.csv', index_col='lot_sale_year')
>plt.plot(df)
>plt.title('Sales per year in Amsterdam, 1676-1739')
Then I plotted the amount of recorded sales in The Hague:

```bash
$ awk -F ',' '{print $5}' denhaagc.csv | sort | uniq -c > denhaagyears.csv
$ sed 's/  /,/g' denhaagyears.csv > denhaagyears1.csv
$ sed 's/ /,/g' denhaagyears1.csv > denhaagyears2.csv
$ csvcut -c 2,3 denhaagyears2.csv > denhaagyears.csv

> df = pd.read_csv('denhaagyears.csv', index_col='lot_sale_year')
> plt.plot(df)
> plt.title('Sales per year in Den Haag, 1676 - 1739')
> plt.show()
```
Together plotted:
>import matplotlib.patches as mpatches
>blue = mpatches.Patch(color='blue', label='Amsterdam')
>orange = mpatches.Patch(color='orange', label='Den Haag')
>df = pd.read_csv('amsterdamyears.csv', index_col='lot_sale_year')
>plt.plot(df)

>df = pd.read_csv('denhamyear.csv', index_col='lot_sale_year')
>plt.plot(df)

>plt.title('Recorded sales per year in Amsterdam and Den Haag, 1676 - 1739')
>plt.legend(handles=[blue, orange])
>plt.show()
The line representing Den Haag shows that there were 10 data points. I figured that a histogram or bar chart would be a more accurate representation of the data. I now tried to fit some of the charts in one plot to compare the data on the different Dutch cities in one image.

```bash
$csvgrep -c 10 -m 'Leiden' joined.csv > leiden.csv
$csvgrep -c 10 -m 'Rotterdam' joined.csv > rotterdam.csv
$csvgrep -c 10 -m 'Middelburg' joined.csv > middelburg.csv
$sed 's/The Hague/Den Haag/g' denhaagc.csv > denhaag.csv
$csvstack denhaagc.csv amsterdam.csv > join_ams_dh.csv
$csvstack join_ams_dh.csv rotterdam.csv > join_ams_dh_r.csv
$csvgrep -c 2 -m "Middelburg" joined.csv > middelburg.csv
$csvstack join_ams_dh_r.csv middelburg.csv > join_ams_dh_r_m.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>import numpy as np
>df = pd.read_csv('join_ams_dh_r_m.csv')

>>df.groupby('city_of_sale')['lot_sale_year'].plot(kind='hist',legend=True)
```
Middelburg is not really showing up and the data of Rotterdam is covering the part of The Hague. This is not a very informative chart in this form, so I just used Amsterdam and The Hague.

```python
> df = pd.read_csv('join_ams_dh.csv')
> df.groupby('city_of_sale')['lot_sale_year'].plot(kind='hist', legend=True)
> plt.title("Amount of sales in Amsterdam and The Hague between 1676-1740")
> plt.xlabel("Years")
> plt.show()
```
Plotted the first graph again, but this time also showing the results from Rotterdam and the total amount of sales in this period:

```
$ awk -F ',' '{print $5}' joined.csv | sort | uniq -c > jointotal.csv
$ sed 's/  /,/g' jointotal.csv > jointotal1.csv
$ sed 's/ /,/g' jointotal1.csv > jointotal2.csv
$ csvcut -c 2,3 jointotal2.csv > jointotal.csv

$ awk -F ',' '{print $5}' rotterdam.csv | sort | uniq -c > rs.csv
$ sed 's/  /,/g' rs.csv > rs1.csv
$ sed 's/ /,/g' rs1.csv > rs2.csv
$ csvcut -c 2,3 rs2.csv > rs.csv
```

```python
>import pandas as pd
>import matplotlib.pyplot as plt
>import numpy as np
>import matplotlib.patches as mpatches
>blue = mpatches.Patch(color='blue', label='Den Haag')
>red = mpatches.Patch(color='red', label='Amsterdam')
>green = mpatches.Patch(color='green', label='Rotterdam')
>black = mpatches.Patch(color='black', label='Total')
>df = pd.read_csv('amsterdamyears.csv', index_col='lot_sale_year')
```
Instead of a total line (too messy), I plotted a line with the mean.
The data on the amount of recorded sales of The Hague, Amsterdam and Rotterdam at the begin of the eighteenth century is visible, but the mean line does not visualize what I want to communicate, instead I did choose the graph with the total number of sales in this period. Next I zoomed in on the data that we have got about the period between 1690 and 1700. First looked at the statistics of a view of the columns regarding sellers and auction houses in The Hague.

```
$ csvcut -e utf-8-sig -c 8 joined.csv | csvstat
 1. "auc_house_name_1"
  | Type of data: Text
```
Contains null values: False
Unique values: 10
Longest value: 24 characters
Most common values: [Anonymous] (7385x)
                      Jan Pietersz. Zomer (2001x)
                      Pieter Raket (134x)
                      J. Magnus (131x)
                      Hendrik Kerfly (114x)

$csvcut -e utf-8-sig -c 6 joined.csv | csvstat
1. "sell_auth_name_1"

  Type of data: Text
  Contains null values: True (excluded from calculations)
  Unique values: 91
  Longest value: 55 characters
  Most common values: None (3038x)
                      Meyers, Jacques (265x)
                      Six, Willem (258x)
                      Biesum, Quiryn van (223x)
                      Huls, Samuel van (209x)

$csvcut -e utf-8-sig -c 27 joined.csv | csvstat
1. "sell_name_1"

  Type of data: Text
  Contains null values: False
  Unique values: 392
  Longest value: 66 characters
  Most common values: _ (7187x)
                      Cornelis van Dyck (147x)
                      David Grenier (137x)
                      Petronella de la Court (120x)
                      Philips de Flines (100x)

I now noticed that the column ‘sale_location’ is a cleaned up column with information about the city of sale. Only the notation of ‘Den Haag’ is used instead of both ‘Den Haag’ and ‘The Hague’. This column is easier to use for reference.

$csvgrep -c 9 -m 'Den Haag' joined.csv > dh.csv
There is no plotable information about buyers in The Hague, they are all notated as ‘Anonymous’ or data is missing. Therefore, I plotted the information about buyers in the whole of the Republic.

```python
>df = pd.read_csv('joined.csv')
>df['buy_name_1'].value_counts().plot(kind='barh')
>plt.show()
```

The chart shows that for almost every row of the 9000+ records, there is no information on the buyer. The ‘_’ (absence of data) distorts the distribution of the bar chart, so I deleted it to get a better view of the data on buyers.

```bash
$csvgrep -c 31 -r "_" -i joined.csv > buyers.csv
```

```python
>df['buy_name_1'].value_counts().plot(kind='barh')
>plt.title('Recorded buyers in the Republic, 1676-1740')
>plt.show()
```
I also made two bar plots on columns that I found interesting regarding the sellers, it is:

```python
import pandas as pd
import matplotlib.pyplot as plt

df = pd.read_csv('dh.csv')

# Title_PG_Sell_1
df['title_pg_sell_1'].value_counts().plot(kind='barh')
plt.title('Visualization of column Title_PG_Sell_1 of Den Haag')
plt.show()
```

---

**Recorded buyers in the Republic, 1676-1740**

- Reinier vander Wolf
- D. Potter
- Van der Meer, advocaat van Justitie in Hollandt
- Marinus de Jeude, Drossard of den Ed. Hoven van Holland
- Ond. van der Meere
- Johan van Schuylenburg, Burgemeester
- Coenraad Baron Droste
- Jacques Jordens
- den Wel Ed. Heer Joan de Vries, Burgemeester der Stadt Amsterdam
- Cornelis van Dyck
- den Heer Adriaen Bout, Raad en Agent van zijn C:F:D: van Trier
- Mr. Samuel van Hul, Burgemeester van 's Gravenhage
What do the contents of these columns exactly mean:

**Title_pg_sell_1:**
“Verbatim name or other identifying information about the first seller found on the title page of the catalog. This information can be very specific, i.e., the actual name and title of a seller, or just the seller’s profession. Other information may include the location (either street address, city, or estate name) of the seller or the collection, the location where the collection was purchased, or whether the seller was deceased or had declared bankruptcy. In most cases, multiple names will appear in a single field, i.e., title_pg_sell_1. If nothing about the seller or collection is mentioned on the title page, the field has None, Keine, or Aucun.”

**Sell_auth_name_1:**
“Authority name of seller identified in title_pg_sell_n, auc_copy_seller_n, or other_seller_n.”

While the second notation covers a bigger part of the dataset, there is no notable difference between the two graphs. The
first one gives us more information about the occupation of
the sellers.
For example, the seller who sold the most lots (in his name)
was Samuel van Huis, the major of Den Haag. This is why I used
the chart based on this column.

Zooming in on the years 1690 – 1700, based on the graph
showing the recorded sales in The Hague there is only two
years in this decennium with records: the year 1692 and 1693.
I’m first looking at the records of 1692.

```
$csvgrep -c 16 -r "1692" dh.csv > select_dh.csv
$csvcut -e utf-8-sig -c 5 select_dh.csv | csvstat
  1. "title_pg_sell_1"
    Type of data: Text
    Contains null values: False
    Unique values: 1
    Longest value: 77 characters
    Most common values: Johan van Tongeren, Advocaet voor de
respective Hove van Justitie in Hollandt (84x)
```

The painters with most works represented in this dataset:

```
$csvcut -e utf-8-sig -c 19 select_dh.csv | uniq -c | sort -r | head
  8 "PietervanLaer,aliasBamboots"
  6 MichielAngelodellaBataille
  6 Crabbe
  5 Brouwer
  5 "PetitJean,aliasBiche"
  3 JanBoth
  3 JanBot
  3 Gerards
  3 GasparPoussin
  3 FranciscoMosa
```

Now looking at the contents of the dataset of 1693:

```
$csvgrep -c 16 -r "1693" dh.csv > select_dh1.csv
$csvcut -e utf-8-sig -c 5 select_dh1.csv | csvstat
  1. "title_pg_sell_1"
    Type of data: Text
    Contains null values: False
    Unique values: 1
```
The painters with most works represented in this dataset:
$csvcut -e utf-8-sig -c 19 select_dh1.csv | uniq -c| sort -r
 2 FranchescoParmiggiano
 2 Bambootz
 1 artist_name_1
 1 [Italian]
 1 ParisPordono
 1 Manfredo
 1 JacobPinas
 1 Guartzyn
 1 Calcar
 1 Bassan

The art sale in 1692 concerns one auction, under supervision of the mentioned Johan van Tongeren. His occupation was ‘Advocaet voor de respective Hove van Justitie van Hollandt’, or lawyer of the Court of Justice of the province of Holland. It is very likely that this was an auction following on a bankruptcy, Johan van Tongeren is not known as a art collector or art dealer himself. There is no information on buyers or the specific auction house.

For the art sale in 1693: Van der Werf passed away in 1679, the auction of a part of his collection took place in 1693. The auctioned collection of Van der Wolf consists of Italian painters and Dutch painters who painted in the Italian style.

It makes sense to compare the results of The Hague with Amsterdam.

$csvgrep -c 9 -m 'Amsterdam' joined.csv > amst.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>df = pd.read_csv('amst.csv')
>df['title_pg_sell_1'].value_counts().plot(kind='barh')
>plt.title('Visualization of column Title_PG_Sell_1 of Amsterdam')
>plt.show()
The visualization above shows all the sellers over the years 1676 – 1740. It is clear that there are more records of sales in Amsterdam. I plotted again with the dataset on Amsterdam, this time on the column ‘sell_auth_name_1’.

```python
>import pandas as pd
>import matplotlib.pyplot as plt
>df = pd.read_csv('amst.csv')
>df['sell_auth_name_1'].value_counts().plot(kind='barh')
>plt.title('Visualization of column Sell_Auth_Name_1 of Amsterdam')
>plt.show()
```
The 34th bar in the first graph shows ‘Van het Loo’, or the Loo Palace, already hinting at the seller. In the second graph the name of the seller is revealed: ‘Orange, William III of, King of England’. This must refer to the auction of the royal collection of the Stadholder-King William III. It is interesting to see, that the sales are recorded in Amsterdam, and not in The Hague.

These graphs only show information about the sellers in Amsterdam, not the buyers.

I wanted to show the years of the sales, to get a better understanding of which seller was active in what year.

```python
>import pandas as pd
>import matplotlib.pyplot as plt

>df = pd.read_csv('amst.csv')
>df = df.groupby(['lot_sale_year', 'sell_auth_name_1'])['title'].count()
>df.plot.barh()
>plt.title('Amount of works sold per seller, sorted on year')
>plt.show()
```
Next, I compared the sellers in the period prior to 1700. For some reason awk does not work with the amst.csv file so I selected all the recorded sales prior to 1700 in the joined.file and then selected all the sales that took place in Amsterdam.

$ awk -F ',' '$16 < 1700' joined.csv > join1700.csv
$ csvgrep -c 9 -m 'Amsterdam' join1700.csv > amst1700.csv
Manually added the header row in again.

>import pandas as pd
>import matplotlib.pyplot as plt

>df = pd.read_csv('amst1700.csv')
>df = df.groupby(['lot_sale_year', 'sell_auth_name_1'])[['title']].count()
>df.plot.barh()
>plt.title('Amount of works sold per seller, sorted on year')
There are 558 rows without information about the seller, I plotted the sellers that are recorded prior to the year 1700. Regarding the amount of paintings sold per seller in a year, I assume these numbers represent auctions where a certain amount of paintings were sold in one go. There is no information about auction houses, if applicable.

I compared the ‘sell_auth_name_1’ and ‘title_pg_sale_1’ columns with each other to see if there would be additional info about, for example, the profession of the sellers.
$csvcut -c 5,6 amst1700.csv | uniq

title_pg_sell_1,sell_auth_name_1
Graaf van Arondel,"Norfolk, Henry Howard, 6th Duke of"
Antony Hoevenaar,"Hoevenaar, Antony"
"Dissius, Jacob"
Henrietta Popta,"Popta, Henrietta"
Herman van Swoll,"Swoll, Herman van"

$csvgrep -c 6 -r "Norfolk, Henry Howard, 6th Duke of" amst1700.csv |
$csvcut -c 19 | uniq -c | sort -r | head
  4 J.Ovens
  3 AnthonyvanDyck
  2 RomboutUylenburgh
  2 OttoMerseus
  2 J.Ovens
  2 J.Ovens
  2 CoenraedAlbin
  2 Bamboots
  2 AdriaenBrouwer
  1 eenItaliaen

$csvgrep -c 6 -r "Dissius, Jacob" amst1700.csv | csvcut -c 19 | uniq -c | sort -r | head
  12 J.vanderMeervanDelft
   7 J.vanderMeervanDelft
   5 P.deLaar(anders)Bamboots
   4 SimondeVlieger
   3 JanSteen
   3 EmanueldeWit
   3 Ayala
   2 [Italian]
   2 Vermeer
   2 MoucherondeOude

$csvgrep -c 6 -r "Swoll, Herman van" amst1700.csv | csvcut -c 19 | uniq -c | sort -r | head
  6 GerardLaresse
  4 N.Berghem
  4 Laresse
  3 SimonVerelst
  3 NicolaesBerghem
  3 M.AngelodelaBatallie
  3 Gerards
Most recorded painters:

15 Carelotti
12 J.vanderMeervanDelft
 7 J.vanderMeervanDelft
 6 GerardLaresse
 5 [Anonymous]
 5 P.deLaar(anders)Bamboots
 4 deWet
 4 [Italian]
 4 SimondeVlieger
 4 PhilipWouwerman

There are no contents in the ‘genre’ column unfortunately, so I searched for patterns roughly matching the common genres in the files containing the data of Amsterdam, The Hague and the total and count them. I will put the results for the total, the period prior to 1700 and after 1700.
$echo "Landscape,total,\$(csvgrep -c 18 -r ".*[Ll]andschap.*" joined.csv | csvcut -c 18 | wc -l)" > genre.csv
$echo "Stillife,total,\$(csvgrep -c 18 -r ".*[Ss]tilleven.*" joined.csv | csvcut -c 18 | wc -l)" >> genre.csv
$echo "Historical,total,\$(csvgrep -c 18 -r ".*[Hh]istori.*" joined.csv | csvcut -c 18 | wc -l)" >> genre.csv
$echo "Scene with Christ,total,\$(csvgrep -c 18 -r ".*[Cc]hrist.*" joined.csv | csvcut -c 18 | wc -l)" >> genre.csv
$echo "Scene with Maria,total,\$(csvgrep -c 18 -r ".*[Mm]aria.*" joined.csv | csvcut -c 18 | wc -l)" >> genre.csv
$echo "Marines,total,\$(csvgrep -c 18 -r ".*[Zz]ee.*" joined.csv | csvcut -c 18 | wc -l)" >> genre.csv
$echo "Scene with Farmers,total,\$(csvgrep -c 18 -r ".*[Bb]oer.*" joined.csv | csvcut -c 18 | wc -l)" >> genre.csv
$echo "Italian scene,total,\$(csvgrep -c 18 -r ".*[Ii]talia.*" joined.csv | csvcut -c 18 | wc -l)" >> genre.csv

Repeated these steps for the following files:
join1700.csv
joinafter1700.csv
amst.csv
amst1700.csv
amstafter1700.csv
dh.csv
dh1700.csv
dhafter1700.csv

Had to manually rearrange the columns from vertical to horizontal. Plotted the results:

csvcut -c 2,5,8 genre2.csv > genretotal1.csv
csvcut -c 6-7 genre2.csv > amsterdampcompare.csv
csvcut -c 9-10 genre2.csv > denhraagcompare.csv

Manually made genre3.csv and genre3total.csv with the amount of paintings before and after 1700.

> import pandas as pd
> import matplotlib.pyplot as plt
> import numpy as np
```
> df = pd.read_csv('genretotal1.csv')
> df.plot(kind='bar'); plt.legend(loc='best')
> plt.title("Sample of genres in recorded sales")
> plt.xticks(np.arange(8), ('Landscape', 'Stillife', 'Historical', 'Scene with Christ', 'Scene with Maria', 'Marines', 'Scene with Farmer', 'Italian scene'), rotation=90)

> df = pd.read_csv('amsterdamcompare.csv')
> df.plot(kind='bar'); plt.legend(loc='best')
> plt.title("Sample of genres in recorded sales in Amsterdam")
> plt.xticks(np.arange(8), ('Landscape', 'Stillife', 'Historical', 'Scene with Christ', 'Scene with Maria', 'Marines', 'Scene with Farmer', 'Italian scene'), rotation=90)

> df = pd.read_csv('denhaagcompare.csv')
> df.plot(kind='bar'); plt.legend(loc='best')
> plt.title("Sample of genres in recorded sales in The Hague")
> plt.xticks(np.arange(8), ('Landscape', 'Stillife', 'Historical', 'Scene with Christ', 'Scene with Maria', 'Marines', 'Scene with Farmer', 'Italian scene'), rotation=90)

> df = pd.read_csv('genre3total.csv')
> df.plot(kind='bar'); plt.legend(loc='best')
> plt.title("Sample of genres in recorded sales, prior and after 1700")
> plt.xticks(np.arange(8), ('Landscape', 'Stillife', 'Historical', 'Scene with Christ', 'Scene with Maria', 'Marines', 'Scene with Farmer', 'Italian scene'), rotation=90)

> plt.show()
```
The genres I used are just a sample of the real genres of the works in the database. The total of records for Amsterdam in the database is 6623, my sample covered 1924 works, the total of records of The Hague is 1401, covered by 409 works in my sample. It is safe to assume that a big part of the historical and religious scenes have very specific titles, not easy to filter out with just one identifier. Also, a fair share of paintings are mentioned with ‘een dito scene’, when multiple similar scenes were bought in one go. The shift before and after 1700 regarding landscapes is remarkable, seen the fact that a lot of landscapes were identified and recorded as just a landscape. Other identifiers like ‘gezicht’ (view) is only mentioned 4 times and ‘bos’ (forest) 25 times by comparison. Identifiers that are also worth mentioning: Haven (100x), Bloem (301x), Tronie/Trony (129x).

I plotted a bar chart for the distribution of recorded sales regarding landscape and marine paintings between 1676 and 1740.

```bash
$csvgrep -c 18 -r ".*[Ll]andschap.*" joined.csv | csvcut -c 16,18 > landscapeyear.csv

$csvgrep -c 18 -r ".*[Zz]ee.*" joined.csv | csvcut -c 16,18 > marineyear.csv
```

```python
>import pandas as pd
>df = pd.read_csv('landscapeyear.csv')
>df['lot_sale_year'].value_counts().sort_index().plot(kind='line', color='green', legend=True)
>plt.title('Sample recorded sales "Landscapes" in period 1676 - 1740')

>df = pd.read_csv('marineyear.csv')
```
And plotted against the total:

> black = mpatches.Patch(color='black', label='Total')
> csv('joined.csv')
> df['lot_sale_year'].value_counts().sort_index().plot(kind='line',
linestyle='dashed', color='black', legend=True)
Because I shifted perspective a view times already, I grabbed the original files again to select some other columns to plot. I first wanted to look briefly at the profits.

```
$ csvcut -c 1-4,20,22,73,108,109 sccomined.csv > pricecombine.csv
$ csvcut -c 1,13,22,48,56,57,60 sales_descriptions.csv > descriptcombine.csv
$ csvjoin -c 1,2 descriptcombine.csv pricecombine.csv > allprices.csv

$ csvgrep -c 5 -m "Den Haag" allprices.csv > pricesdh.csv
$ csvgrep -c 10 -m "1692" pricesdh.csv > auction1692.csv
$ csvcut -e utf-8-sig -c 15 auction1692.csv | csvstat

Returns an error code, the contents of "price_amount_1" are seperated by ":", replaced those with ".".

$ sed 's/:/./g' auction1692.csv > auction1692a.csv
$ csvcut -e utf-8-sig -c 15 auction1692a.csv | csvstat
1. "price_amount_1"

   Type of data:          Text
   Contains null values:  False
   Unique values:         71
   Longest value:         9 characters
   Most common values:    111.00.00 (3x)
                         72.00.00 (2x)
                         70.00.00 (2x)
                         460.00.00 (2x)
                         360.00.00 (2x)

1.
Data is read like text. Deleted the ":" this time.

```bash
$ sed 's/://g' auction1692.csv > auction1692b.csv
$ csvcut -e utf-8-sig -c 15 auction1692b.csv | csvs
```

1. "price_amount_1"

<table>
<thead>
<tr>
<th>Type of data:</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains null values:</td>
<td>False</td>
</tr>
<tr>
<td>Unique values:</td>
<td>71</td>
</tr>
<tr>
<td>Smallest value:</td>
<td>900</td>
</tr>
<tr>
<td>Largest value:</td>
<td>9,000,000</td>
</tr>
<tr>
<td>Sum:</td>
<td>136,950,320</td>
</tr>
<tr>
<td>Mean:</td>
<td>1,630,360,952</td>
</tr>
<tr>
<td>Median:</td>
<td>1,205,000</td>
</tr>
<tr>
<td>StDev:</td>
<td>1,492,410,846</td>
</tr>
<tr>
<td>Most common values:</td>
<td>1,110,000 (3x) 720,000 (2x) 700,000 (2x) 4,600,000 (2x) 3,600,000 (2x)</td>
</tr>
</tbody>
</table>

I do not know how the numbers in the original notation are meant to be read:

- 405:00:00
- 72:00:00
- 9:00
- 11:10
- 28:10:00

There are different types of notations, and I just assume that the pair of zeroes after the last ":" can be ignored, so sample of the prices above can be read as ‘405,00’, ‘72,00’, ‘9,00’, ‘11,10’ and ‘28,10’. But since I do not know for certain, the Github page of the Getty Provenance Index gives no further explanation of the notation and the currency is seldom noted. I will not use this column further on, and the estimates of prices of the paintings sold in this period are already covered by Montias in his researches.

Back to the original columns of interest, I plotted the total of recorded sales of Amsterdam and The Hague again, and highlighted key events of the life of William III on the x-axis.

```python
> import pandas as pd
> import matplotlib.pyplot as plt
```
>import matplotlib.patches as mpatches

>blue = mpatches.Patch(color='blue', label='Amsterdam')
>orange = mpatches.Patch(color='orange', label='Den Haag')

df = pd.read_csv('amsterdamyears.csv', index_col='lot_sale_year')
plt.plot(df, color='blue')

df = pd.read_csv('denhaagyears.csv', index_col='lot_sale_year')
plt.plot(df, color='orange')

plt.axvline(x=1689, color='gray', ymax=0.50, linestyle='--', label='Stadholder William III crowned as King of England')
plt.text(1689, 350, 'William III crowned King', horizontalalignment='center')
plt.axvline(x=1702, color='gray', ymax=0.75, linestyle='--', label='William III dies')
plt.text(1702, 525, 'William III dies', horizontalalignment='center')
plt.axvline(x=1714, color='gray', ymax=0.85, linestyle='--', label='Auction art collection William III')
plt.text(1714, 585, 'Auction William III', horizontalalignment='center')
plt.title('Recorded sales per year in Amsterdam and Den Haag, 1676 - 1739')
plt.legend(handles=[blue, orange])
plt.show()
After plotting the results above, I shifted to the dataset concerning sales in England:

```bash
$awk -F ',' '$4 < 1740' sales_contents_6.csv > sales1.csv
$awk -F ',' '$4 < 1740' sales_contents_7.csv > sales2.csv
$csvstack
$awk -F, '$1 ~ /BRITISHSALES/ {print}' salesstack.csv > britishsales_1740.csv
$awk -F, '$25 ~ /Dutch/ {print}' britishsales_1740 > artistsalesb.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>import matplotlib.patches as mpatches
>blue = mpatches.Patch(color='blue', label='Recorded sales in the Republic')
>orange = mpatches.Patch(color='orange', label='Recorded British sales of Dutch artworks')

>df1 = pd.read_csv('yearssales.csv', index_col='lot_sale_year')
>plt.plot(df1)

>df2 = pd.read_csv('artistsalesb.csv')
>df2 = df2.groupby(['lot_sale_year'])['title'].count()
>plt.plot(df2)
>plt.title('Amount of works sold per country between 1670-1740')
>plt.legend(handles=[blue, orange])
>plt.savefig('britishsales1.png')
This is a sample of the total of 60822 rows, filtered on the string ‘Dutch’ in the column ‘nationality_1’, based on the nationality of the artist. Gave 1518 results against 9936 of the Dutch sales total. The following graph is a sample of the total of 60822 rows, filtered on the string ‘Dutch’ in every column. Gave 8719 results against 9936 of the Dutch sales total.

$awk -F, '/Dutch/ {print}' britishsales_1740 > artistsalesb2.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>import matplotlib.patches as mpatches
>blue = mpatches.Patch(color='blue', label='Dutch sales')
>orange = mpatches.Patch(color='orange', label='British sales')
>df1 = pd.read_csv('yearssales.csv', index_col='lot_sale_year')
>plt.plot(df1)
>df2 = pd.read_csv('artistsalesb2.csv')
>df2 = df2.groupby(['lot_sale_year'])['title'].count()
>plt.plot(df2)
grep -l 'Dutch' britishsales_1740.csv > artistsalesb2.csv
Making a list of all the artists mentioned and occurrences in this file.
> import pandas as pd
> df = pd.read_csv('artistsalesb2.csv', low_memory=False)
> df = df['artist_name_1'].value_counts()
> print df.to_csv('artistsbritishsales.csv', sep=’,’, mode='a')

For the other files I have searched for the earliest occurring year.
$cut -d, -f4 sales_contents_5.csv | sort -n | head

Created the following list manually:

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1668</td>
<td>British sales</td>
</tr>
<tr>
<td>1715</td>
<td></td>
</tr>
<tr>
<td>1811</td>
<td></td>
</tr>
<tr>
<td>1760</td>
<td></td>
</tr>
<tr>
<td>1808</td>
<td>British sales</td>
</tr>
<tr>
<td>1676</td>
<td>British sales/Dutch sales</td>
</tr>
<tr>
<td>1657</td>
<td>Dutch sales/French sales</td>
</tr>
<tr>
<td>1742</td>
<td></td>
</tr>
<tr>
<td>1670</td>
<td>German sales</td>
</tr>
<tr>
<td>1930</td>
<td></td>
</tr>
<tr>
<td>1930</td>
<td></td>
</tr>
<tr>
<td>1928</td>
<td></td>
</tr>
</tbody>
</table>

For Germany
$awk -F ',' '4 < 1740' sales_contents_10.csv > salesgermany.csv
$awk -F, '$1 ~ /GERMANSALES/ {print}' salesgermany.csv > germansales_1740.csv
$awk -F, '{$25 ~ /Dutch/ {print}}' german_1740 > artistsalesg.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>blue = mpatches.Patch(color='blue', label='Recorded sales in the Republic')
>orange = mpatches.Patch(color='orange', label='Recorded German sales of Dutch artworks')

>df1 = pd.read_csv('yearssales.csv', index_col='lot_sale_year')
>plt.plot(df1)

>df2 = pd.read_csv('artistsalesg.csv')
>df2 = df2.groupby(['lot_sale_year'])['title'].count()
>plt.plot(df2)
>plt.title('Amount of works sold per country between 1670-1740')
>plt.legend(handles=[blue, orange])
>plt.savefig('germansales1.png')
For France:
$awk -F ',' '$4 < 1740' sales_contents_8.csv > salesfrench.csv
$awk -F, '$1 ~ /FRENCHSALES/ {print}' salesfrench.csv > frenchsales_1740.csv
$awk -F, '$25 ~ /Dutch/ {print}' frenchsales_1740 > artistsalesf.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>import matplotlib.patches as mpatches
>blue = mpatches.Patch(color='blue', label='Recorded sales in the Republic')
>orange = mpatches.Patch(color='orange', label='Recorded French sales of Dutch artworks')

>df1 = pd.read_csv('yearssales.csv', index_col='lot_sale_year')
>plt.plot(df1)
>df2 = pd.read_csv('artistsalesf.csv')
>df2 = df2.groupby(['lot_sale_year'])['title'].count()
>plt.plot(df2)
>plt.title('Amount of works sold per country between 1670-1740')
>plt.legend(handles=[blue, orange])
>plt.savefig('frenchsales1.png')
$awk -F ',' '$4 < 1740' sales_contents_10.csv > salesscandi.csv
$ awk -F, '$1 ~ /SCANDINAVIANSALES/ {print}' salesscandi.csv > scandisales_1740.csv
$ awk -F, '$25 ~ /Dutch/ {print}' scandisales_1740 > artistsaless.csv

>import pandas as pd
>import matplotlib.pyplot as plt
>blue = mpatches.Patch(color='blue', label='Recorded sales in the Republic')
>orange = mpatches.Patch(color='orange', label=' Recorded Scandinavian sales of Dutch artworks')

df1 = pd.read_csv('yearssales.csv', index_col='lot_sale_year')
plt.plot(df1)

df2 = pd.read_csv('artistsaless.csv')
df2 = df2.groupby(['lot_sale_year'])['title'].count()
plt.plot(df2)
plt.title('Amount of works sold per country between 1670-1740')
plt.legend(handles=[blue, orange])
plt.savefig('scandisales1.png')
List with occurrences of painters:

$csvgrep -c 4 -r '1690' britishsales.csv > 1690b.csv
$csvgrep -c 4 -r '1691' britishsales.csv > 1691b.csv
$csvgrep -c 4 -r '1692' britishsales.csv > 1692b.csv

import pandas as pd
import numpy as np

>df = pd.read_csv('1690b.csv', low_memory=False)
>df = df['sell_name_1'].value_counts()
>print (df.to_csv('sellers1690.csv', sep=',', mode='a'))

>df = pd.read_csv('1691b.csv', low_memory=False)
>df = df['sell_name_1'].value_counts()
>print (df.to_csv('sellers1691.csv', sep=',', mode='a'))

>df = pd.read_csv('1692b.csv', low_memory=False)
>df = df['sell_name_1'].value_counts()
>print (df.to_csv('sellers1692.csv', sep=',', mode='a'))