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A Scalable Perspective on Historical Cinema Cultures: Studying Movie Going in Amsterdam (1952–1972) with Digital Data and Tools

Introduction

The rapid digitization of archival holdings over the past decades has made a wealth of historical sources available to scholars in the field of media studies. At the same time, a broad variety of tools have become available as open or licensed software that can be employed to search, enrich, visualize, and analyze these sources. Newly emerging research infrastructures, such as the Media Ecology Project, Lantern, Distant Viewing Lab, or CLARIAH Media Suite, are aiming to provide sustainable access to such data and tools for the purpose of research and teaching.[1] And, in tandem, new methodologies are being developed to make sense of these historical data at various levels of analysis, including the suite of tools for cross-disciplinary research in the Media Ecology Project;[2] the use of mapping tools for the analysis of film distribution and consumption;[3] the Visual Annotation Tool to support the qualitative analysis of film color;[4] the "cinemetrics" approach to analyze shot duration as a marker of film style;[5] and the "distant viewing" framework for the automated, quantitative analysis of the content and style of films and television series.[6]

1 See https://mediaecology.dartmouth.edu/wp/; https://lantern.mediahist.org/; https://www.distantviewing.org/; https://mediasuite.clariah.nl/, accessed November 12, 2023.

2 Mark Williams and John Bell, "The Media Ecology Project: Collaborative DH Synergies to Produce New Research in Visual Culture History," *Digital Humanities Quarterly* 15, no. 1 (2021), accessed November 12, 2023, https://www.digitalhumanities.org/dhq/vol/15/1/000524/000524.html.

3 Laura Horak, "Using Digital Maps to Investigate Cinema History," in *The Arclight Guidebook to Media History and the Digital Humanities*, ed. Charles R. Acland and Eric Hoyt (Falmer: REFRAME Books, 2016), 65–102.

4 Gaudenz Halter et al., "VIAN: A Visual Annotation Tool for Film Analysis," *Computer Graphics Forum* 38, no. 3 (2019): 119–129, https://doi.org/10.1111/cgf.13676.

5 Yuri Tsivian, "Cinemetrics: Part of the Humanities' Cyberinfrastructure," in *Digital Tools in Media Studies: Analysis and Review, An Overview*, ed. Michael Ross, Manfred Grauer, and Bernd Freisleben (Bielefeld: Transcript, 2009), 93–100.

6 Taylor Arnold and Lauren Tilton, "Distant Viewing: Analyzing Large Visual Corpora," *Digital Scholarship in the Humanities* 34, issue supplement 1 (2019): i3–i16, https://doi.org/10.1093/llc/

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While generating exciting new opportunities for researching the history of film, radio, television, and online video and audio at an unprecedented scale and level of complexity, such digital media historical research also presents new challenges. In particular, the process of turning sources into data and processing them with various types of software raises questions about how to account for such transformations in the analysis of findings. As such, digital research demands a new kind of literacy from media scholars, who have to evaluate what historical "truths" emerge, and to what extent these are shaped by digital transformation and processing. In this chapter, I investigate the use of digital data and tools in film historical research, evaluating the opportunities and challenges. In particular, I investigate the epistemological and methodological implications of data-driven media historiography by asking what knowledge it brings and how scholars may negotiate the methodological challenges. I apply a "scalable research framework," which outlines how digital data and tools can be integrated in a research workflow that alternates between the macro level of identifying patterns in large datasets, across space and through time, and the micro level of one particular movie.

In order to explore the opportunities and challenges of digital film historiography in research practice, my contribution focuses on a central case study: the programming of Dutch fiction films in Amsterdam cinemas from 1952 until 1972.[7] The choice of period was partly motivated by the available data, which cover the period 1948–1995 (as an addition to the already available programming data for Dutch cinemas until 1947 included in Cinema Context[8]) and for which we produced clean programming data for the sample years 1952, 1962, and 1972 (in parallel with the sample years for which data are available on the programming of cinemas in Belgium[9]). Historically, this period includes the peak of cinema-going in the postwar period and its gradual decline from the 1960s. The year 1972 marks the end of the model of the single screen cinema, soon followed by multiplex cinemas that entailed new dynamics of programming and movie-going. Whereas the first decades of Dutch film and cinema history have been extensively studied,[10]

fqz013; Taylor Arnold and Lauren Tilton, *Distant Viewing: Computational Exploration of Digital Images* (Cambridge, MA: MIT Press, 2023).

7 This case study is part of the research for my current book project on digital methods for media historiography.

8 See https://cinemacontext.nl/, accessed November 12, 2023.

9 Vincent Ducatteeuw et al., "Critical Reflections on Cinema Belgica: The Database for New Cinema History in Belgium," *Journal of Open Humanities Data* 9, no. 1 (2023), https://doi.org/10.5334/johd.91.

10 Karel Dibbets and Frank van der Maden, *Geschiedenis van de Nederlandse Film en Bioscoop tot 1940* (Houten: Wereldvenster, 1986); Clara Pafort-Overduin, "Hollandse films met een Hol-

the period after WWII has been less well researched, particularly regarding the distribution and exhibition of Dutch films. The case study I am discussing therefore focused on the programming of Dutch fiction films in Amsterdam cinemas in the first decades after WWII in the context of the overall programming, on which data had become available due to the automatic extraction of programming data from the film listings in digitized Dutch newspapers.[11] The analysis focused on discovering geographical, thematic, and longitudinal patterns in the programming of the films in Amsterdam cinemas to investigate the relative share and topics of "national" content presented to local audiences. Following the trajectory of extracting film listings from digitized newspapers via the visualization and analysis of this data with Python notebooks and Gephi network analysis software, up until the interpretation and contextualization of the results, my contribution in the present chapter provides a methodological reflection on the practice of doing digital film historiography and outlines a proposed framework for "scalable film historical research."

Over the past decades, film scholars have critically examined the concept of national cinema.[12] As Marie Cronqvist and Christoph Hilgert have pointed out, media histories are not confined to national borders or media specificity; they plead for a more integrative approach to "entangled media histories."[13] In line with this, my case study is considered in the broader socio-cultural context of movie going, extending the analysis beyond the medium specific into the broader historical context of exhibition and reception. As the following analysis will demonstrate, understanding the programming of Dutch fiction films in Amsterdam in-

lands hart. Nationale identiteit en de Jordaanfilms 1934–1936" (PhD diss., Utrecht University, 2012), http://dspace.library.uu.nl/handle/1874/256372; Judith Thissen, "Understanding Dutch Film Culture: A Comparative Approach," *Alphaville: Journal of Film and Screen Media* 6 (2013): 1–14, accessed February 24, 2023, https://www.alphavillejournal.com/Issue6/HTML/ArticleThissen.html.

11 This was done at the University of Amsterdam's CREATE research program and lab in the context of the DIGIFIL project, which received support from the CLARIAH CORE project. See https://www.clariah.nl/nl/projecten/digifil-digital-film-listings, accessed November 12, 2023.

12 Tim Bergfelder, "National, Transnational or Supranational Cinema? Rethinking European Film Studies," *Media, Culture & Society* 27, no. 3 (2005): 315–331, https://doi.org/10.1177/0163443705051746; Thomas Elsaesser, "ImpersoNations: National Cinema, Historical Imaginaries and New Cinema Europe," *Mise Au Point. Cahiers de l'association Française Des Enseignants et Chercheurs En Cinéma et Audiovisuel* 5 (2013), https://doi.org/10.4000/map.1480; Andrew Higson, "The Concept of National Cinema," *Screen* 30, no. 4 (1989): 36–47, https://doi.org/10.1093/screen/30.4.36; Jerry White, "National Belonging: Renewing the Concept of National Cinema for a Global Culture," *New Review of Film and Television Studies* 2, no. 2 (2004): 211–232, https://doi.org/10.1080/1740030042000276653.

13 Marie Cronqvist and Christoph Hilgert, "Entangled Media Histories," *Media History* 23, no. 1 (2017): 130–141, https://doi.org/10.1080/13688804.2016.1270745.

vites a comparison with films from other production countries, which ensures a more transnational perspective on this local cinema culture. Finally, as the analysis will show, a data-driven approach to such a case raises questions about the definition of national cinema and thus ultimately leads to a deconstruction and rethinking of the whole idea of national film. As such, in addition to exploring the use of digital methods for film historiography, this chapter aims to evaluate how a data-driven research approach may shed new light on the intricacies of researching historical transnational media cultures.

Conceptual and Methodological Frameworks for Digital (Media) Historical Research

The focus on the ways in which digital technologies impact historical research is especially relevant for the field of media studies. As Jentery Sayers argues, it is important to acknowledge that all technologies have values embedded in them that influence how we interpret their output: "practitioners should be cognizant of not only the values and histories embedded in technologies, but also how those values and histories shape interpretation."[14] Technologies "are intricately interlaced with labor and knowledge production in and beyond the academy,"[15] and it is, in fact, hard to separate our analysis from them, as "we are entangled with the media we produce and research."[16] For example, Adrian Mackenzie in his ethnographic study of "machine learners" has shown how specific subject positions are generated in the design and operation of machine learning technologies.[17] Jasmijn Van Gorp et al. also demonstrate how the development of a digital media research infrastructure is the result of a co-development approach between scholars' needs, technological affordances, and development skills, which invites reflection on the mediating role of digital technology.[18] In fact, as Sayers indicates, "media

14 Jentery Sayers, "Introduction: Studying Media Through New Media," in *Routledge Companion to Media Studies and Digital Humanities*, ed. Jentery Sayers (London: Routledge, 2018), 1.

15 Sayers, "Introduction: Studying Media Through New Media," 2.

16 Sayers, "Introduction: Studying Media Through New Media," 2.

17 Adrian Mackenzie, *Machine Learners: Archaeology of a Data Practice* (Cambridge, MA: MIT Press, 2017).

18 Jasmijn Van Gorp, Liliana Melgar Estrada, and Julia Noordegraaf, "Involving Users in Infrastructure Development: Methodological Reflections from the Research Pilot Projects Using the CLARIAH Media Suite," *TMG Journal for Media History* 24, nos. 1–2 (2021): 1–10, https://doi.org/10.18146/tmg.809.

studies and digital humanities work through new media as means and modes of inquiry."[19]

Based on my case study, the present chapter focuses on the practice of doing film historical research with digital data and tools in order to understand the various processes of cultural transcoding that are taking place, and that impact what we can know about historical cinema cultures. In this way, it hopes to contribute to the literacy that working with digital data and tools for media historiography requires. Over recent years, scholars have started developing conceptual frameworks for grasping the impact of digital technology on the access to and use of data in historical research. After outlining two such frameworks, I will in the subsequent section apply them to the case study to demonstrate how they can be used in the context of a digital cinema research project.

In their paper "Data scopes for digital historical research," Rik Hoekstra and Marijn Koolen present the concept of the "data scope" to reflect on and describe the various steps that researchers take in a data-driven research workflow, and the impact these steps have on research findings and their interpretation.[20] As they indicate, when using digital collections, historians interact with their data in an iterative fashion, enriching and enlarging them over the course of the research process. Each step of selection, enrichment, and classification involves choices based on the exploration and interpretation of the data.[21] Data interaction should be seen as an integral part of doing digital research and the creation of data scopes is a crucial part of the digital source criticism that is required to make all forms of digital historiography transparent and accountable.[22]

A data scope "represents the process through which different views on research data are created that are relevant to a specific research question."[23] Data scoping as a research method requires that the researcher answers a set of questions. These include the question of how the dataset itself, as well as the subsets obtained through queries, relates to the original source data; the question of how the transformations observed can be taken into account when analyzing findings in the light of both the research question and the source material; and the question of how to describe the data scope, so that others can retrace the steps taken by the

19 Sayers, "Introduction: Studying Media Through New Media," 2.

20 Rik Hoekstra and Marijn Koolen, "Data Scopes for Digital History Research," *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 52, no. 2 (2019): 79–94, https://doi.org/10.1080/01615440.2018.1484676.

21 Hoekstra and Koolen, "Data Scopes for Digital History Research," 79.

22 Hoekstra and Koolen, "Data Scopes for Digital History Research," 92–93.

23 Hoekstra and Koolen, "Data Scopes for Digital History Research," 80.

researcher.[24] In collecting the answers to these questions, the data scope becomes the place that links "different resources that were compiled with different purposes" and describes how these data have been extended and contextualized.[25]

The second framework for analyzing the impact of digitization on media historical research data was developed in a collaboration among interdisciplinary researchers at the University of Wisconsin-Madison and Concordia University. There, Eric Hoyt, Charles Acland, and their collaborators have built a tool (Arclight) and a critical framework for what they call "Scaled Entity Search" (or SES): the search for and analysis of specific entities in the contents of the Media History Digital Library.[26] They used the knowledge obtained in building and using the Arclight tool to develop a framework that alerts us to elements in a digital workflow that influence the knowledge we can obtain from the data on the phenomenon studied.[27] SES is thus both a method for performing searches and a critical framework for interpreting their results.[28] It is this framework that I will focus on here, as it provides a useful conceptual tool for assessing the impact of digitization on the research process and the interpretation of the findings. The SES framework was developed specifically for search, but its components are also relevant for critically reflecting on the impact of working with film programming data extracted from a digitized newspaper corpus.

The framework focuses on three key elements: the entities (people, objects, places, events), the corpus (the collection of sources from which the data derive), and the digital (the technological processing of the sources and data). For each, it presents a set of questions that alert users to the impact that choices made for each element have on their findings.[29] For the *entities*, the SES framework asks users to reflect on how the list of entities was developed and formed: which terms have been selected, based on which sources, and which ones have been omitted? For the *corpus*, researchers should reflect on the size and scope, the context of its creation, what it covers, and – importantly – what aspects of the topic it does *not* reflect. Concerning the *digital*, the framework invites researchers to question the origin and quality of the metadata used and the impact of the soft-

24 Hoekstra and Koolen, "Data Scopes for Digital History Research," 92.
25 Hoekstra and Koolen, "Data Scopes for Digital History Research," 81.
26 See https://projectarclight.org/; https://mediahistoryproject.org/, accessed August 25, 2023.
27 Eric Hoyt et al., "Scaled Entity Search: A Method for Media Historiography and Response to Critiques of Big Humanities Data Research," in *2014 IEEE International Conference on Big Data (Big Data)* (Washington, DC: IEEE, 2014), 51–59, https://doi.org/10.1109/BigData.2014.7004453.
28 Eric Hoyt et al., "Searching, Mining and Interpreting Media History's Big Data," in *Routledge Companion to Media Studies and Digital Humanities*, ed. Jentery Sayers (London: Routledge, 2018), 414.
29 Hoyt et al., "Searching, Mining and Interpreting Media History's Big Data," 417.

ware and settings employed to transform analogue sources into digital ones (e.g., how the quality of the transcription with Object Character Recognition software (OCR) impacts the search results). Finally, the SES framework asks how these three elements relate to one another and how in combination they impact the search results.

Corpus and Methods

How were the conceptual frameworks of data scopes and Scaled Entity Search operationalized for the research I conducted on the programming of Dutch films in local cinemas? In my case study, the entities are the film screenings in Amsterdam cinemas as advertised in dedicated listings in national and local newspapers. This choice was based on a focus on the film screening event, following Karel Dibbets, who argues that the screening (When) is what brings together all the elements of a local film culture: Who (people, companies), What (films), and Where (cinemas).[30] From the perspective of data scopes, this focus on the film screening event was the basic unit of the model. The sources for these film listings were national newspapers, which, during the research period, contained advertisements for film screenings in dedicated sections in local editions for Amsterdam, Rotterdam, The Hague, and Utrecht. These newspapers had been collected by the National Library of the Netherlands, which provided detailed information on the selection and completeness of the newspaper collection and on the selection for and processing of the corpus for digitization, including the quality of the OCR.[31] For our three sample years, the corpus was complete in its coverage.

The nature of the listings, which are highly structured, and the relatively good quality of the OCR allowed for automatic extraction of the data, although a fair amount of semi-manual cleaning was required to obtain a usable dataset.[32] The screenings as advertised in the local and national newspapers are generally a good proxy for what films historical audiences actually saw in Amsterdam in

30 Karel Dibbets, "Cinema Context and the Genes of Film History," *New Review of Film and Television Studies* 8, no. 3 (2010): 331–342, https://doi.org/10.1080/17400309.2010.499784.

31 See https://www.kb.nl/onderzoeken-vinden/bijzondere-collecties/kranten; https://www.metamorfoze.nl/boeken-kranten-en-tijdschriften/digitalisering-kranten; https://www.kb.nl/en/research-find/datasets/delpher-newspapers; https://www.delpher.nl/over-delpher/wat-zit-er-in-delpher/wat-zit-er-in-delpher/kranten#cc362, accessed August 20, 2023.

32 Ivan Kisjes et al., "DIGIFIL Final Report" (Amsterdam: University of Amsterdam/CREATE, 2020), https://doi.org/10.21942/UVA.12651683.V1.

those three sample years.[33] Together, the process of extraction and cleaning generated a comprehensive dataset documenting the phenomenon. At the same time, it should be acknowledged that the coverage of the cleaned dataset is limited to the three sample years, meaning that screenings of the same film in the periods in between may have been missed.[34] It was also restricted to screenings in the commercial circuit of cinema theatres that operated under the umbrella of the National Cinema Union (NBB). The alternative circuit of screenings that took place in the context of ideologically driven associations (e.g., Catholic, Protestant, and Communist) were not included and thus not visible in this corpus.[35] Thus the modeling choice to focus on the film screening event as the moment when audience members encounter a film with a specific local profile did not fully account for the impact of the organization of the exhibition sector.

In line with the existing approaches to digital source criticism outlined above, I will in the following analysis elaborate on the process of selecting, collecting, cleaning, linking, visualizing, analyzing, and interpreting data on the exhibition of Dutch films in the context of the overall cinema culture in Amsterdam in the period 1952–1972.

Dataset

The starting point for the extraction of the data on film screenings in Amsterdam for the three sample years was the Cinema Context database: a collection of structured data on films, cinemas, people, and companies, which allows one to reconstruct the "DNA" of Dutch film culture.[36] Upon its launch in 2006, Cinema Context contained screening data on films screened in cinemas in major Dutch cities up until 1948. In order to expand this data to the post-WWII period, the research team in the DIGIFIL project (a programmer, four senior researchers (including

33 Except in cases where titles have been wrongly advertised, as in the case of a film starring actress Lizabeth Scott that had been advertised as screened in Hollandia with only her name as the title in the *Algemeen Handelsblad* of August 1, 1952, https://resolver.kb.nl/resolve?urn=KBNRC01:000088512:mpeg21:a0035, accessed November 8, 2023.

34 How we compensated for this in the analysis is outlined in the Dataset section below.

35 See Thunnis van Oort, "Industrial Organization of Film Exhibitors in the Low Countries: Comparing the Netherlands and Belgium, 1945–1960," *Historical Journal of Film, Radio and Television* 37, no. 3 (2017): 475–498, https://doi.org/10.1080/01439685.2016.1157294.

36 Dibbets, "Cinema Context and the Genes of Film History," 336; Thunnis van Oort and Julia Noordegraaf, "The Cinema Context Database on Film Exhibition and Distribution in the Netherlands: A Critical Guide: Arts and Media," *Research Data Journal for the Humanities and Social Sciences* 5, no. 2 (2020): 91–108, https://doi.org/10.1163/24523666-00502008.

myself), and two research assistants), which was conducted between 2018 and 2020, experimented with the automatic extraction of film screening data from the film listings in the digitized newspapers in the Delpher database at the KB National Library of the Netherlands.[37]

We started by sourcing the major national newspapers for the period 1948 (the first year for which we lacked comprehensive screening data in Cinema Context) until 1995 (the last year for which newspapers were available in Delpher). This resulted in a collection of around 20,650,000 articles from *De Tijd*, *De Telegraaf*, *De Volkskrant*, *De Waarheid*, *Algemeen Handelsblad*, *Trouw*, *Het Parool*, and *NRC*. In order to be able to automatically extract the film screenings from the OCR-ed newspaper advertisements, we had to take three subsequent steps, for which a processing pipeline was created: (1) Locating the listings in newspapers: classifying the articles in the corpus as a film listing or other; (2) Parsing the listings: identifying the entities in them (film titles, names of cinemas, screening times, etc.); (3) Linking the film titles: linking extracted titles with entries in external databases such as the Internet Movie Database for identification.[38]

The result was a set of about 200 lists of cinema programs for the four largest cities of the Netherlands (Amsterdam, Rotterdam, The Hague, and Utrecht) for every year from 1948 until 1995. The evaluation of the results of the automatically extracted data against a "golden standard," a manually created dataset of Rotterdam film screenings 1951–1953, showed that the data was far from clean; the identification of film titles was especially problematic. In order to be able to use them for the analysis of the distribution of Dutch films, seen against the total number of films screened, therefore, the data had to be cleaned. For this, we devised a semi-manual process, combining Python scripts for matching extracted titles against reference databases with manual checking of the scans of the newspapers on the Delpher portal or other online sources (e.g., Wikipedia) for the film titles that were unidentified or for which the match seemed problematic.

The amount of work involved in semi-manually cleaning such a big dataset required a selection in the scope of the corpus. We decided to focus on the programming of the cinemas in Amsterdam, the capital city, for which we had programming data up to 1948 but on which academic research for the post-WWII era was still lacking. The three sample years – 1952, 1962, 1972 – were chosen to facilitate comparative research with the Cinema Belgica database, which contains similar

37 Kisjes et al., "DIGIFIL Final Report."

38 All the steps are fully described in Kisjes et al., "DIGIFIL Final Report," which also includes links to the scripts stored in https://gitlab.com/uvacreate/digifil, accessed September 22, 2023.

data on film screenings in Flanders and Brussels for the same three years.[39] In order not to miss films that premiered in the first week of January, we added the newspapers of the last week of the year prior to the sample years. The cleaning operation yielded a dataset with 8,608 lines of film screenings for the cinemas active in Amsterdam in the three sample years.[40] The resulting dataset thus severely restricted the analysis to commercially operating cinemas in the capital city and to three sample years, which may not be representative for the period nor for the country as a whole. So, in the end, this data allowed for a snapshot of a specific, local urban cinema culture.

Methods

In order to analyze the data for trends at the level of the city and the cinemas, a "ranking and counting"[41] method was used, in combination with data visualization for qualitative analysis.[42] For both we ran Python scripts on the data in a Jupyter notebook environment on the Google Colab service.[43] The workflow entailed a close dialogue between a programmer (Ivan Kisjes) and researcher (me) on the questions for which the scripts retrieved relevant subsets of the data and generated visualizations. As my own literacy is limited to a basic level of reading Python code, such a dialogue with the programmer was required to understand how the code retrieves and visualizes which subset of the data was relevant for a specific research question. The Jupyter notebook provided an excellent support for such a dialogue, as it contains both the code and a space to explain in normal language

39 See https://www.cinemabelgica.be/, accessed on September 22, 2023. See Ducatteeuw et al., "Critical Reflections on Cinema Belgica"; Julia Noordegraaf et al., "Discovering Cinema Typologies in Urban Cinema Cultures: Comparing Programming Strategies in Antwerp and Amsterdam, 1952–1972," in *The Palgrave Handbook of Comparative New Cinema Histories*, ed. Daniela Treveri Gennari, Lies Van de Vijver, and Pierluigi Ercole (Cham: Palgrave Macmillan, 2023), 239–262, https://doi.org/10.1007/978-3-031-38789-0_12.

40 The dataset and scripts are published in an open repository: https://gitlab.com/uvacreate/cinema-context/scalable-perspective-on-historical-film-cultures.

41 Dibbets, "Cinema Context and the Genes of Film History"; Julia Noordegraaf, Kathleen Lotze, and Jaap Boter, "Writing Cinema Histories with Digital Databases: The Case of Cinema Context," *TMG Journal for Media History* 21, no. 2 (2018): 106–126, https://doi.org/10.18146/2213-7653.2018.369.

42 Ben Fry, *Visualizing Data: Exploring and Explaining Data with the Processing Environment* (Sebastopol, CA: O'Reilly, 2007).

43 The notebook file is available at https://gitlab.com/uvacreate/cinema-context/scalable-perspective-on-historical-film-cultures.

which function it performs.[44] As such, it also responds to the growing demand for open scholarship, allowing others to inspect and replicate the analyses.[45]

For the meso-level analysis of the content of the films from the different countries of production, we conducted a qualitative Visual Network Analysis[46] of co-occurring plot keywords using Gephi software.[47] This again was a collaboration, with the programmer (Kisjes) proposing the idea and generating the visualizations, and the researcher (me) interpreting the results via qualitative content analysis. The micro-level analysis of the content of the films shown was conducted by myself, using qualitative interpretation of contextual information on the films and their content.

The "Glocality" of Amsterdam Cinema Culture in Numbers

This section analyses the screenings of Dutch films seen against the total of films from other parts of the world screened in Amsterdam in 1952 (35 cinemas), 1962 (38 cinemas), and 1972 (32 cinemas). The dataset contains 8,608 screenings in total, of which 230 are screenings of unidentified film titles. The latter generally relates to films that were screened as part of dedicated afternoon programming for children (e.g., "Woody Woodpecker cartoon festival" at Cineac Reguliersbreestraat in 1972) and night screening programs (e.g., "Highlights from the erotic film festival" at The Movies in 1972), which were left out of the analysis. In total, 2,991 unique known film titles were shown in the three sample years, of which 53 were Dutch films, including five co-productions (with Germany [3], Belgium [1], Brazil [1]). The 53 Dutch films were screened 285 times (amounting to 1.7% of the total

44 Mari Wigham, Liliana Melgar, and Roeland Ordelman, "Jupyter Notebooks for Generous Archive Interfaces," in *2018 IEEE International Conference on Big Data (Big Data)* (Seattle, WA: IEEE, 2018), 2766–2774, https://doi.org/10.1109/BigData.2018.8622203.

45 Bernadette M. Randles et al., "Using the Jupyter Notebook as a Tool for Open Science: An Empirical Study," in *2017 ACM/IEEE Joint Conference on Digital Libraries (JCDL)* (Toronto, ON: IEEE, 2017) 1–2, https://doi.org/10.1109/JCDL.2017.7991618.

46 Mathias Decuypere, "Visual Network Analysis: A Qualitative Method for Researching Sociomaterial Practice," *Qualitative Methods* 20, no. 1 (2020): 73–90, https://doi.org/10.1177/1468794118816613.

47 Mathieu Bastian, Sebastien Heymann, and Mathieu Jacomy, "Gephi: An Open Source Software for Exploring and Manipulating Networks," in *Proceedings of the Third International Conference on Weblogs and Social Media* 3, no. 1 (2009): 361–362, accessed February 24, 2023, http://aaai.org/ocs/index.php/ICWSM/09/paper/view/154.

number of unique films and 3.4% of the total number of 8,378 screenings, so the few Dutch films were screened relatively often).

Overall, in those three sample years, Amsterdam cinemas screened films from 49 countries of production (see Table 1). The distribution of the films from those countries is very skewed: films produced in the United States had by far biggest share of the market (1,412 titles, 47.2% of all unique film titles screened in Amsterdam in the sample years), followed by films produced in the United Kingdom (12%), France (11.8%), Italy (10%), and Germany (6.6%), with Sweden (2.1%) and the Netherlands (1.7%) leading the "long tail" of titles from all other countries, many of which had less than ten titles screened in the sample years, and some figuring in the list only as co-producing country (see Figure 1).

Table 1: Number of unique films shown in Amsterdam cinemas in 1952, 1962, 1972, per country of production (co-productions are counted per equal share in the production); omitting films from countries with less than ten screenings in total. The totals per country do not always add up as some films have been screened in multiple years.

Country	1952	1962	1972	Total	% of total # unique films
USA	472.0	613.5	424.0	1,411.5	47.2
GBR	54.5	186.0	138.8	359.2	12.0
FRA	45.5	202.7	120.1	353.8	11.8
ITA	32.0	119.8	160.7	300.0	10.0
DEU	35.5	116.2	50.4	197.6	6.6
SWE	7.0	27.0	39.8	62.8	2.1
NLD	9.0	22.0	29.5	50.5	1.7
ESP	1.5	11.5	29.9	40.4	1.4
SUHH	3.0	12.0	16.2	29.2	1.0
JPN	0.0	6.2	22.2	28.5	1.0
AUT	5.0	17.0	1.7	23.7	0.8
DNK	7.0	8.5	7.0	21.0	0.7
MEX	2.0	7.5	5.5	14.5	0.5
BEL	1.0	3.5	4.8	9.3	0.3
YUG	0.0	1.7	7.5	9.1	0.3
CHE	2.0	2.7	1.5	6.2	0.2
CAN	1.0	0.0	5.5	6.5	0.2
HUN	1.0	1.0	4.5	5.5	0.2
GRC	0.0	3.8	4.5	7.3	0.2
POL	0.0	2.0	4.0	6.0	0.2
GHN	0.0	0.0	5.0	5.0	0.2
PHL	1.0	2.5	1.5	4.0	0.1
ARG	1.0	2.1	1.1	4.2	0.1
HKG	1.0	2.0	1.0	4.0	0.1
ROM	0.0	1.0	1.0	2.0	0.1
DZA	0.0	0.0	1.8	1.8	0.1

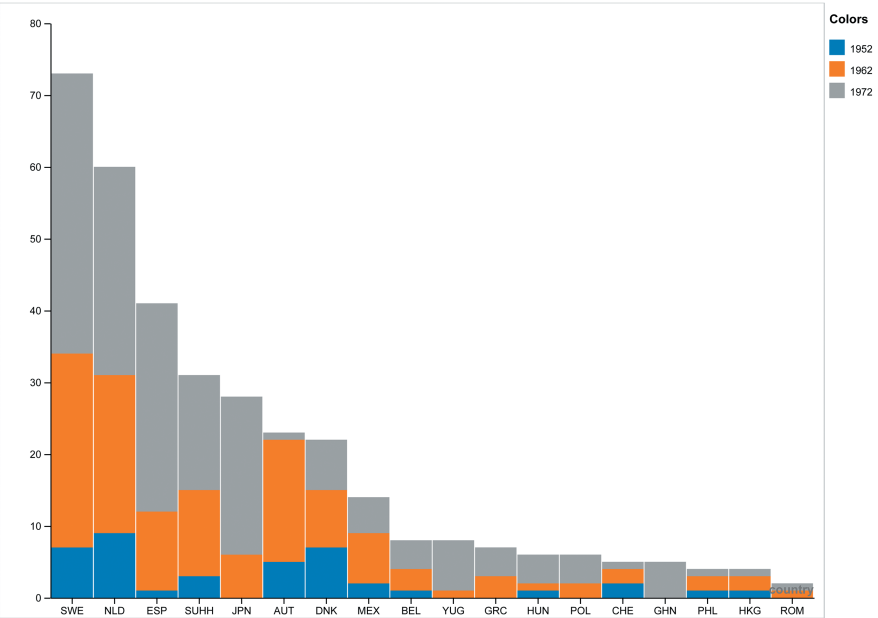


Figure 1: The "long tail" of the number of unique films per country of production (co-productions are split equally over the countries) screened in Amsterdam cinemas in 1952 (blue), 1962 (orange), and 1972 (grey), excluding the USA, GBR, FRA, ITA, DEU and countries with less than 10 screenings.

In addition to the number of unique titles for each country of production, their market share is defined by the number of screenings (Table 2). For example, there are only two Romanian films in our dataset (PUSTIUL [Elisabeta Bostan, 1962] and SERATA [Malvina Ursianu, 1972]) but these have in total been screened 10 times, giving Romania a larger market share than Canada (in total 8 films of which 3 are co-productions, so weighted as 6.5 unique titles, shown only 9 times in total).

Looking at the developments over time in the screenings, we do not observe spectacular changes in the market share of the different countries. However, we can clearly identify a decline of the share of productions from the United States, from 63.1% in 1952 to 45.8% in 1962 and 41.4% in 1972, with a clear growth in the share of films from Italy (from 5.1% in 1952 and 9.8% in 1962 to 11.9% in 1972) and a more modest growth for films from Sweden (from 1.7% in 1952 and 1.9% in 1962 to 3% in 1972) and the Netherlands (from 0.9% in 1952 and 2.9% in 1962 to 5.5% in 1972). If the top five production countries (United States, Great Britain, France, Italy, and Germany) are left out, we see little variation except for the screenings of Dutch films, which steadily increase from 9 films shown in 1952 to 22 in 1962

Table 2: Number of screenings in Amsterdam cinemas in 1952, 1962, 1972, per country of production (co-productions are counted per equal share in the production) and their share (%) of the total amount of screenings.

Country	1952	1962	1972	Total	1952 (%)	1962 (%)	1972 (%)
USA	1,132	1,648	1,237	4,017	63.1	45.8	41.4
FRA	147.5	508	281	937	8.2	14.1	9.4
GBR	168.5	419	434	1021	9.4	11.7	14.5
SWE	31	68	90	189	1.7	1.9	3.0
DEU	129.5	269	120	518	7.2	7.5	4.0
ITA	91	352	357	800	5.1	9.8	11.9
ESP	6.5	27	54	88	0.4	0.8	1.8
DNK	16	28	20	64	0.9	0.8	0.7
NLD	17	104	164	285	0.9	2.9	5.5
MEX	6	11	8	25	0.3	0.3	0.3
CHE	4	8	4	17	0.2	0.2	0.1
PHL	4	6	3	13	0.2	0.2	0.1
CAN	1	0	8	9	0.1	0.0	0.3
SUHH	16	24	39	79	0.9	0.7	1.3
AUT	15	48	4	67	0.8	1.3	0.1
BEL	1	15	17	33	0.1	0.4	0.6
ARG	1	3	3	6	0.1	0.1	0.1
HKG	2	5	3	10	0.1	0.1	0.1
HUN	5	1	19	25	0.3	0.0	0.6
YUG	0	8	16	24	0.0	0.2	0.5
BRA	0	1	2	3	0.0	0.0	0.1
IND	0	3	2	5	0.0	0.1	0.1
GRC	0	9	6	15	0.0	0.2	0.2
JPN	0	10	43	53	0.0	0.3	1.4
IRN	0	1	3	4	0.0	0.0	0.1
CZE	0	2	6	8	0.0	0.1	0.2
EGY	0	4	2	6	0.0	0.1	0.1
POL	0	4	6	10	0.0	0.1	0.2
ZAF	0	1	0	1	0.0	0.0	0.0
HRV	0	2	0	2	0.0	0.1	0.0
ROM	0	2	8	10	0.0	0.1	0.3
AUS	0	1	1	1	0.0	0.0	0.0
NOR	0	3	0	3	0.0	0.1	0.0
ISR	0	1	0	1	0.0	0.0	0.0
DZA	0	0	7	7	0.0	0.0	0.2
LUX	0	0	1	1	0.0	0.0	0.0
PRI	0	0	1	1	0.0	0.0	0.0
TUN	0	0	3	3	0.0	0.0	0.1
TUR	0	0	1	1	0.0	0.0	0.0
HTI	0	0	1	1	0.0	0.0	0.0
BOL	0	0	1	1	0.0	0.0	0.0
PRT	0	0	1	1	0.0	0.0	0.0

Table 2 (continued)

Country	1952	1962	1972	Total	1952 (%)	1962 (%)	1972 (%)
GHA	0	0	2	2	0.0	0.0	0.1
KOR	0	0	1	1	0.0	0.0	0.0
GHN	0	0	15	15	0.0	0.0	0.5
SYR	0	0	1	1	0.0	0.0	0.0
AND	0	0	0	0	0.0	0.0	0.0
IRL	0	0	1	1	0.0	0.0	0.0
Total	1,794	3,594	2,990	8,378	100	100	100

and 32 in 1972 (Table 1). Some films were shown in two of the three sample years: in particular older films from the 1930s, which were shown in both 1952 and 1962: De Jantjes (Jaap Speyer, 1934), Bleeke Bet (Richard Oswald, 1934), and Merijntje Gijzen's Jeugd (Kurt Gerron, 1936). This may be due to the lack of film production in the 1940s and the slow take-up of the industry after the war.[48]

The increase in screenings of Dutch films is also visible in the full programming data for the period 1948–1994 for Amsterdam, The Hague, Utrecht, and Rotterdam (see Figure 2). We can identify the upward trend, with some shared peaks in each city for specific years, which may indicate the release of specific titles. The increase is strongest in the period after 1970, which saw a wave of productions by Dutch filmmakers that emerged from the newly established film school.[49] We also can observe some minor variations between the cities, with Rotterdam having slightly fewer screenings of Dutch films in the period 1980–1994 than the other three cities, suggesting that Rotterdam audiences may have appreciated these national productions less. As such, the visualization is heuristically interesting and allows one to identify points for further analysis. However, the differences are very small and, as the data from this period have not been manually checked, the dataset may contain misidentified titles and thus not be fully representative. Hence, the graph below should be interpreted with care and checked with more in-depth, qualitative analysis for specific sample years.

48 In the period 1940–1959, 21 fiction films were produced in the Netherlands (an average of 1 per year), against 36 in the period 1934–1939 (an average of six per year). Source: Henk van Gelder, *Hollands Hollywood: Alle Nederlandse speelfilms van de afgelopen zestig jaar* (Amsterdam: Luitingh Sijthoff, 1995).

49 Hans Schoots, *Van Fanfare Tot Spetters (1956–1980)* (Amsterdam: Bas Lubberhuizen, 2004).

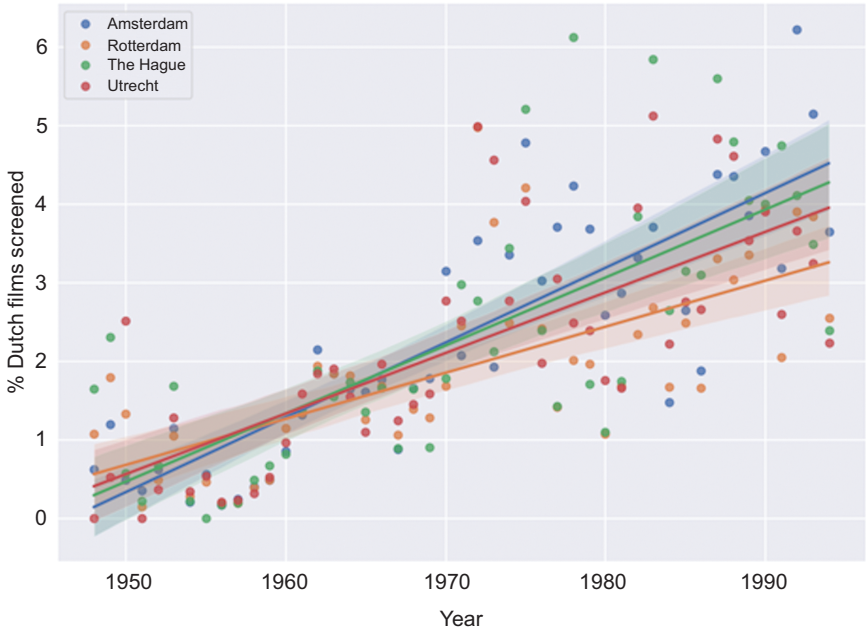


Figure 2: Percentage of screenings of Dutch films between 1948–1994 in Amsterdam (blue), The Hague (green), Utrecht (red), and Rotterdam (orange). As these percentages are very low, differences between the cities are small and the trend lines should be interpreted with care.

Zooming In: Venues

From the macro-level of general statistics on the "glocality" of the Amsterdam film screenings we can zoom in to the level of individual cinemas. The share of Dutch film screenings in the programs of the Amsterdam cinemas ranges from 0% (e.g., Nöggerath in 1952) to 25% (Rialto in 1972). Pie chart visualizations of the screening data provide a sense of the share of the countries of production per theatre and allow for a quick overview of the place of Dutch films in the overall internationality of each one's profile.

In 1952, the Capitol cinema at Rozengracht in the middle of the "popular" Jordaan neighborhood, in addition to a majority of Hollywood films, had a relatively large percentage of Dutch film screenings: 11.1% (see Figure 3). This so-called "neighborhood" cinema, a theatre that catered for local audiences, screened relatively older films, including the already mentioned "Jordaan" films from the 1930s. As most of these films are set in the neighborhood, it is perhaps not surprising that

they had a continued appeal to local audiences. But another neighborhood cinema, the Odeon in Zeeburg in Amsterdam East, also showed older titles such as De Jantjes, Malle Gevallen (Jaap Speyer, 1934) and Pygmalion (Ludwig Berger, 1937) in 1952 and 1962 (although there it amounts to only 3.8% of the screenings in 1952, compared to 11.1% at Capitol).

The pie chart visualizations of arthouse cinemas such as De Uitkijk and Kriterion show that these theatres are clearly compensating for the dominance of Hollywood films by showing films from European countries, in particular Germany, Great Britain, and France (see Figure 4). The arthouse theatres do not program many Dutch films, however. For example, Kriterion did not program any Dutch film in 1952 or 1962, and only two in 1972 (Woensdag [Bas van der Lecq, 1972] and Wat zien ik!? [Paul Verhoeven, 1971]), in which year De Uitkijk only showed one Dutch-Belgian co-production (Mira [Fons Rademakers, 1972]). Perhaps the Dutch films produced in the period did not meet the ambitions of these arthouse theatres to show only "quality films."[50]

The Dutch fiction film production is known to include a large share of children's films, which reached the cinemas once traveling cinema entrepreneur Henk van der Linden started to make children's films with his production company Rex films. Although often critiqued for their lack of quality and one-sided focus on adventure and mischief, his films were very popular among local audiences. For example, De nieuwe avonturen van Dik Trom [The new adventures of Dik Trom] (Henk van der Linden, 1958) was shown in at least one cinema in the Netherlands every week during a period of 28 years, reaching 1,263,250 viewers in the Netherlands and over two million viewers when including the screenings in Surinam and the Dutch Caribbean and 16mm screenings at schools and other venues.[51] In Amsterdam, children's films were shown mostly in neighborhood cinemas, often in afternoon programs alongside evening programming of regular feature films. An example is the Ambassade cinema, a small neighborhood cinema (360 seats) that programed mainstream feature films in the evening (e.g., The Seven Year Itch [Billy Wilder, 1955] with Marilyn Monroe in the week of August 16, 1962), accompanied by Dutch children's films at 2.00 pm in the afternoon (in the week

50 Richard van Bueren, *Saturday Night at the Movies. Het grote Amsterdamse bioscopenboek. Deel 2+3 E–Z* (Amsterdam: Lecuona, 1998), 176, 360.

51 Eye Filmmuseum, "Kleine kijkers, groot publiek: de kinderfilms van Rex Film," Eye Filmmuseum, accessed September 24, 2023, https://www.eyefilm.nl/nl/collectie/collecties/film/dossiers/kleine-kijkers-groot-publiek-de-kinderfilms-van-rex-film. In Amsterdam, the film was shown at Hallen and Rialto in 1962 and again at Rialto and at Victoria in 1972.

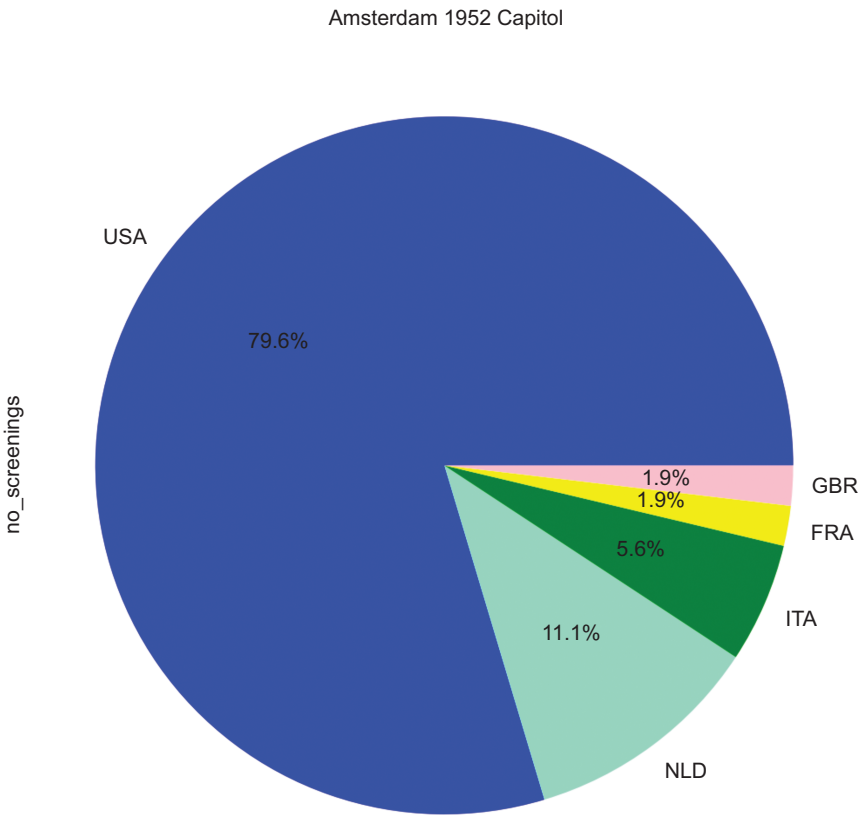


Figure 3: Pie chart visualizations showing the percentage of film screenings per country of production in Capitol and Odeon cinemas in 1952.

of August 16, 1962, Sjors van de Rebellenclub [Henk van der Linden, 1955]).[52] Such films circulated around the neighborhood cinemas owned by the Van Royen family.[53] Some theatres deliberately made "youth cinema" part of their profiles, such as the Rialto cinema at Ceintuurbaan in Amsterdam South and the Bio neighborhood cinema in Amsterdam East, which around the mid-1950s received a "guaran-

52 *De Telegraaf*, August 15, 1962, 8; retrieved from Delpher.nl, https://resolver.kb.nl/resolve?urn=ddd:011204397:mpeg21:p008, accessed September 24, 2023.
53 Noordegraaf et al., "Discovering Cinema Typologies in Urban Cinema Cultures: Comparing Programming Strategies in Antwerp and Amsterdam, 1952–1972."

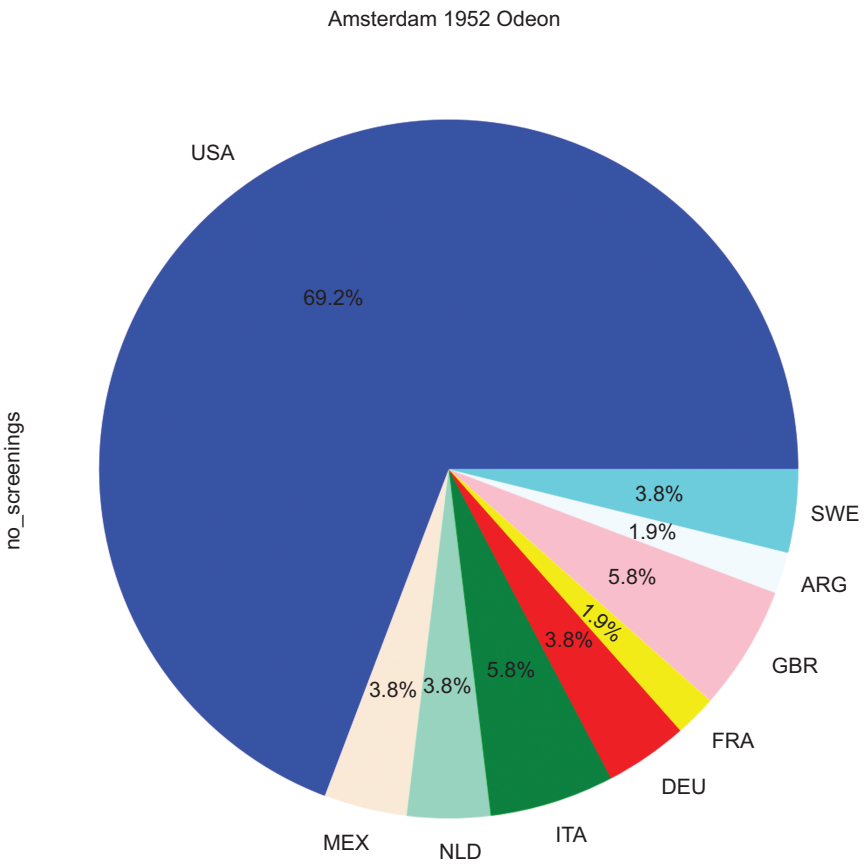


Figure 3 (continued)

tee seal" from the Amsterdam Youth Council.[54] By 1972, the share of Dutch films at Rialto had grown to 25%; these were exclusively children's films (see Figure 5).

Zooming In: Shared Themes

As becomes clear from the above discussion of the (intern)national profile of the Amsterdam cinemas, the visualization of the programming data invites zooming in

54 Richard van Bueren, *Saturday Night at the Movies. Het grote Amsterdamse bioscopenboek. Eerste Deel A–D* (Oss: NCAD uitgeverij, 1996), 46.

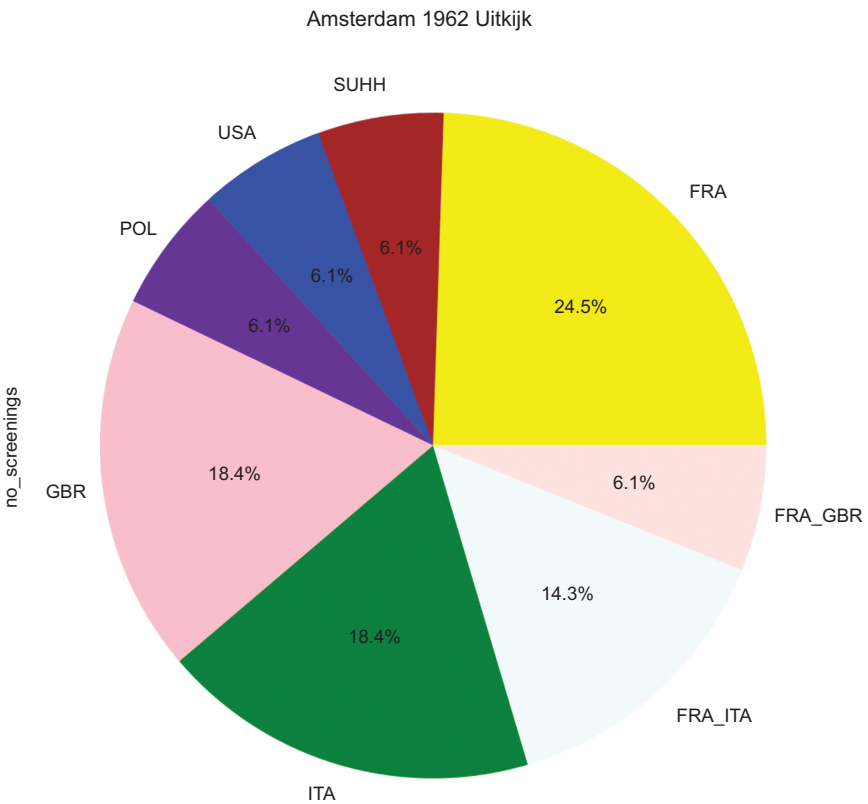


Figure 4: Pie chart visualizations showing the percentage of film screenings per country of production in De Uitkijk cinema in 1962 and 1972.

further to get an impression of the kind of films that make up this profile. Before analyzing the individual film titles in the dataset, we looked at the plot keywords assigned to the films in our dataset in the Internet Movie Database.[55] For this analysis we grouped all films from the same production country that were shown in Amsterdam in any of the sample years (co-productions occur once for each country of production). With the help of the network visualization tool Gephi,[56] we visualized these keywords in a network graph per country of production, where the plot keywords are the nodes, which are linked to each other via keywords shared between

55 This analysis was conducted by Ivan Kisjes at UvA-CREATE. We scraped the plot keywords from the IMDb site and deleted plot keywords that appear in less than three of the films in our dataset.
56 Bastian, Heymann, and Jacomy, "Gephi: An Open Source Software for Exploring and Manipulating Networks."

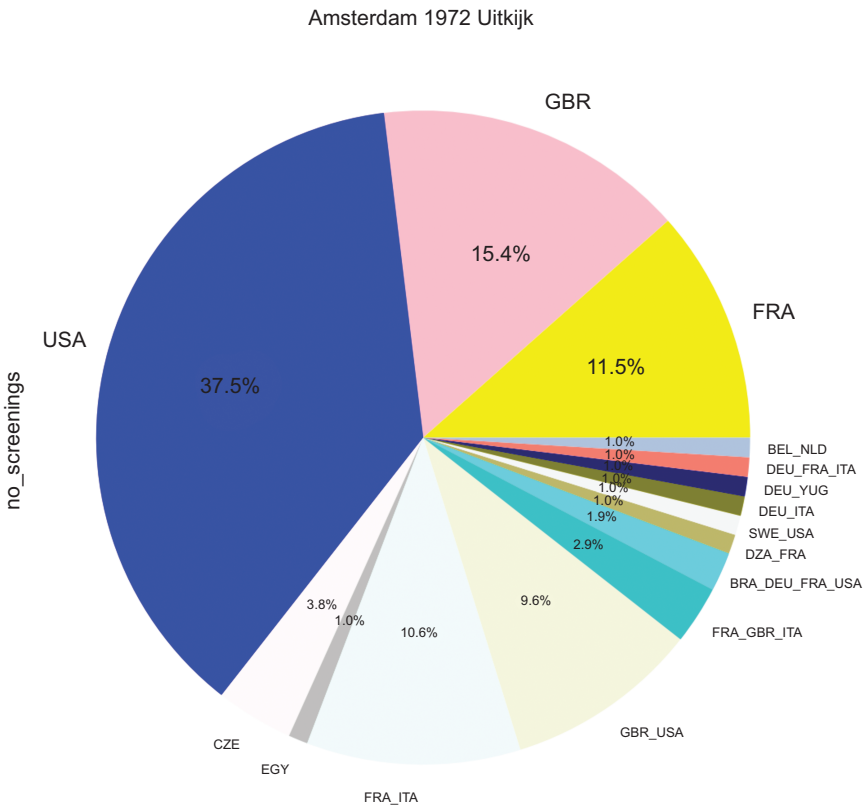


Figure 4 (continued)

the films (edges). The resulting visualization provides a hint of the themes or genres that the films from a specific country of production share, whereby similar keywords shared by various films form clusters with some density, distinguished from each other by different colors, and a larger font indicates keywords shared by more films. The further apart the clusters are positioned, the less overlap there is in the keywords that describe the films in the clusters.

For example, the visualization of the 29 Japanese films of the in total 32 shown in Amsterdam in the sample years for which plot keywords are available on IMDb, shows six large and three smaller separate clusters (Figure 6). The keywords in each cluster give an indication of the thematic of the films they describe. The orange cluster contains "epic" films involving "horseback riding," "campfires," and "forbidden love." It is closely related to the large pink cluster, which at the center appears to reference Samurai martial arts films, with keywords such as "samurai," "battle," "sword," "stabbed with a spear," and "death." On the right-hand side, the pink clus-

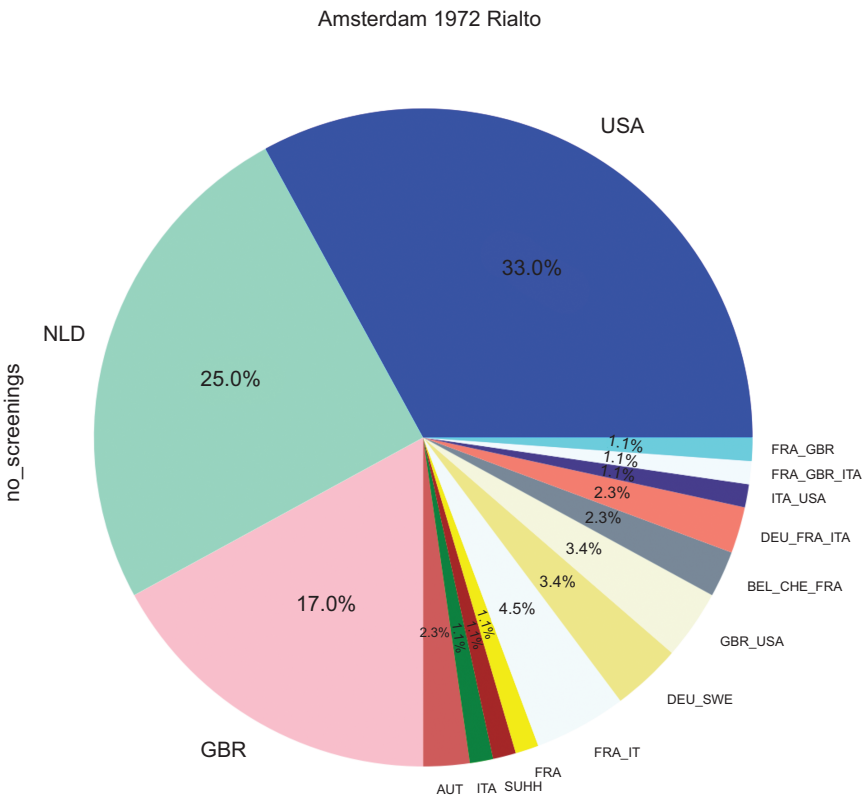


Figure 5: Pie chart visualization showing the percentage of film screenings per country of production at Rialto in 1972.

ter literally references the films from the "Japanese new wave," including "surrealism," "slow motion scene," and naked or undressing characters. The turquois cluster at the top links to the Japanese new wave films but specifically focuses on "neo-noir" films, with "envy," "attempted suicide," and "long takes." The green cluster signals exploitation films including "giant monsters" in the genre of the "psychotronic film"; the fact that it appears separate from the other clusters signals that it concerns a genre of films to which quite distinct keywords apply. The grey cluster contains keywords related to WWII ("u boat," "us soldier"); the blue cluster to "psychological dramas" and "psychological thrillers" (including many drugs-related keywords and style elements such as "long take"); and the light blue cluster to the right Westerns ("saloon," "sheriff's office," "shootout"). The yellow cluster to the right of the green cluster appears to reference dramas set at the beach with the occurrence of broken hearts, bathing suits and a ukulele.

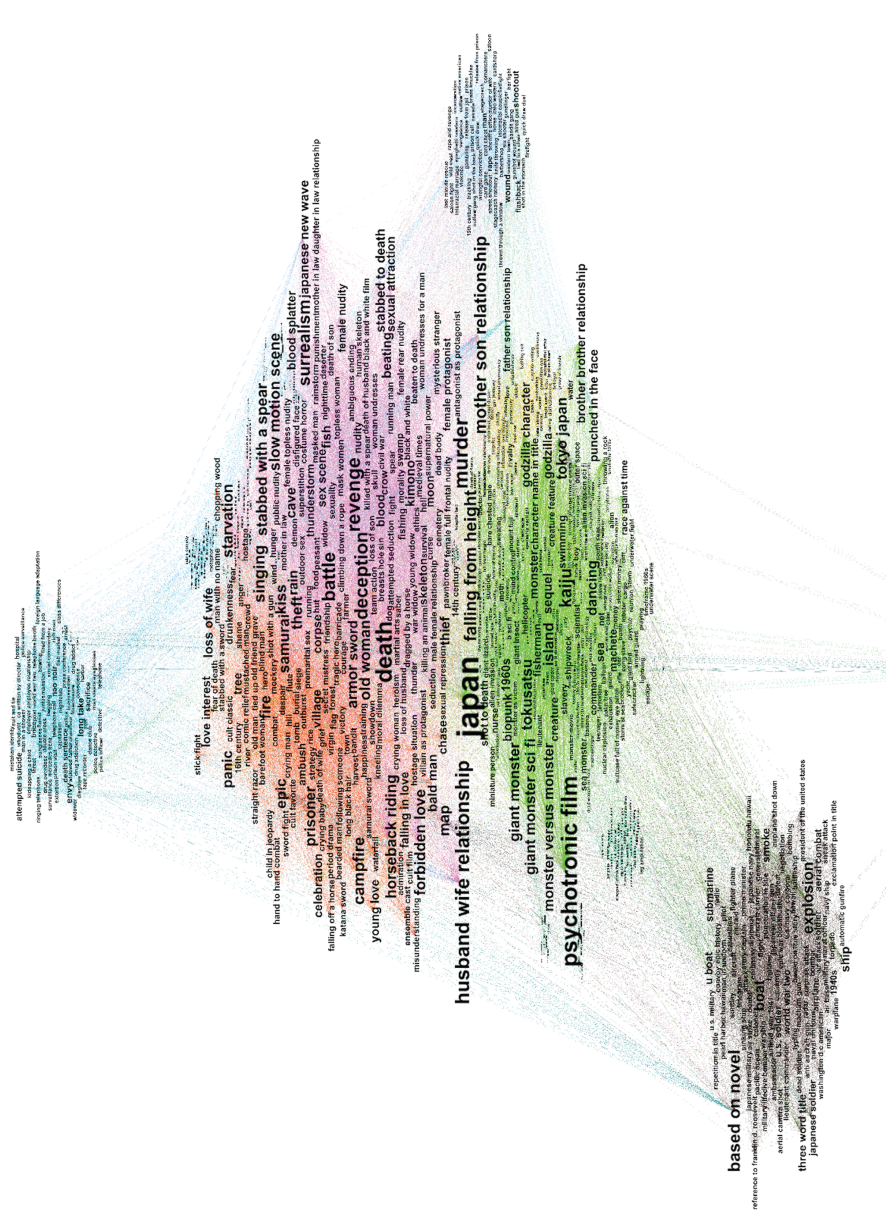


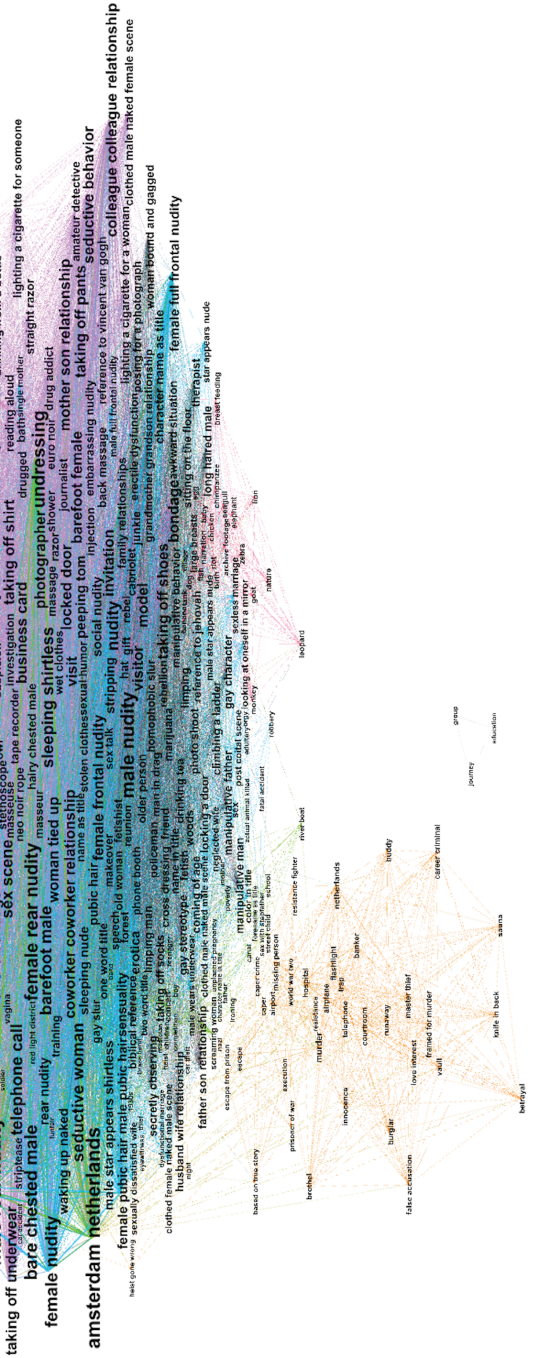
Figure 6: Network visualization of co-occurring plot keywords for 29 (of the in total 32) films (co-) produced in Japan that were screened in Amsterdam cinemas in 1952, 1962, and 1972. Each cluster unites films that are described in similar keywords. Visualization made in Gephi and available at https://gitlab.com/uvacreate/cinema-context/scalable-perspective-on-historical-film-cultures.

The network visualization of the plot keywords for the films produced in the Netherlands shows less well-defined clusters, indicating that the keywords used to describe them are relatively close in meaning (Figure 7). The one outlier is the orange cluster at the bottom that appears to reference war movies and thrillers ("murder," "courtroom," "world war two," "resistance"). Of the 53 Dutch films in our dataset, only 36 have plot keywords on IMDb. Of those keywords, the majority reference nudity and sex ("male nudity," "female nudity," "bondage," "female/male rear nudity," etc.). When examining the dataset, it becomes clear that this signals a clear bias in the IMDb plot keywords: close reading of the actual list of titles reveals that the majority of films screened in Amsterdam theatres in the three sample years were pre-WWII classics or children's films; the plot keywords in the visualization are attributed to the six explicitly sexual films in the corpus. Clearly, the films with sexual content attract most attention by the users of IMDb but that does not provide a reliable picture of what Amsterdam audiences saw of their national film production. This demonstrates the need to conduct proper source and data criticism and to always combine close and distant methods of analysis.

Conclusion and Discussion

What new knowledge may be obtained on the distribution of Dutch films, seen in the context of the overall programming? The scalable analysis of the films screened in Amsterdam presented above shows that Dutch films, although small in number compared to the "big" film countries, were consistently shown to local audiences. Of course, with under 2% of unique titles and just over 3% of the screenings, their market share is comparatively very small, but Dutch films were on the program in every sample year and their absolute number steadily increases over time (the numbers triple between 1952 and 1972). It is striking that the first successful sound films from the 1930s were shown in 1952 and still shown in 1962, indicating that they remained popular for a long time.[57] As discussed, this may partly be explained by the fact that during and after WWII, film production in the Netherlands came almost to a standstill; of the Dutch films screened in 1952 and 1962, only one was made after the war: Een Koninkrijk voor een huis (A Kingdom for a House) (Jaap Speyer, 1949). This had changed by 1972 as a result of the new wave of film makers that had graduated from the newly established film academy.

57 Clara Pafort-Overduin, "Distribution and Exhibition in The Netherlands, 1934–1936," in *Explorations in New Cinema History*, ed. Richard Maltby, Daniel Biltereyst, and Philippe Meers (Hoboken, NJ: Wiley-Blackwell, 2011), 125–139.


female topless nudity
male rear nudity
taking off underwear
bare chested male
female nudity
amsterdam netherlands
female rear nudity
sex scene
female bondage
listening to music
telephone call
sleeping shirtless
photographer undressing
seductive woman
coworker relationship
female frontal nudity
male nudity
colleague colleague relationship
seductive behavior
mother son relationship
taking off pants
barefoot female
boyfriend girlfriend relationship
cheating boyfriend
flashback
one male two females threesome
cheating wife
private investigation
manipulative father
manipulative man
gay character
male star appears nude
female full frontal nudity
bondage
taking off shoes
visitor
model
father son relationship
husband wife relationship
female star appears nude
long haired male
therapist
sitting on the floor
reference to vincent van gogh
lighting a cigarette for a woman
clothed male naked female scene
woman bound and gagged
character name as title
female full frontal nudity
lighting a cigarette
drinking from a bottle
lighting a cigarette for someone
straight razor
reading aloud
drugged
bathtub
mother
drug addict
taking off shirt
business card
tape recorder
neo noir
rape
hairy chested male
wet clothes
stolen clothes
sex talk
stripping
nudity
invitation
social nudity
peeping tom
locked door
injection
embarrassing nudity
back massage
male full frontal nudity
erectile dysfunction
lighting a cigarette for someone
grandmother
grandson relationship
sex
sleeping
journalist
drug
earring
woman in a bathtub
dead body
fainting woman
suspicion
voyeurism
voyeur
taxi
gramophone
pawnshop
prison
wrist sitting
tied hands
female bondage
one eyed man
psychotherapy
jumping into water
drug addiction
investigative journalist
being followed
feet on table
key
dream sequence
photograph
photo studio
strong female character
reference to john wayne
carrying someone
carrying someone in one's arms
wrapped in a towel
animal in a cage
binoculars
riding a motorcycle
following someone
open marriage
mysterious woman
mysterious man
flashback
sex scene
stethoscope
owl
masseur
training
woman tied up
sleeping nude
coworker relationship
seductive woman
barefoot male
female rear nudity
female frontal nudity
male nudity
male star appears nude
female full frontal nudity
sensuality
speech
woman fetishist
manipulative father
manipulative man
gay character
gay stereotype
fetish
wedding
screaming
screaming woman
woman weeping
woman weeping
woman weeping
woman undressing
woman undressing
woman undressing

It is also clear that the largest share was made up by films focused on children and families; overall 29 (55%) of the 53 Dutch films screened in the sample years were children's films (in 1972 this applied to 18 out of the 32 films), primarily shown at neighborhood cinemas and self-declared "youth cinemas." This confirms the conventional wisdom that the Dutch are good at making documentaries and children's films and less so at making fiction.[58] The attempt to analyze the content of the films screened via the IMDb plot keyword co-analysis demonstrates the need to carefully assess the source and scope of the data; in the case of the Dutch films, the keywords were heavily skewed to the six sexually explicit films (only 11% of the total). This demonstrates the nature of IMDb as a user-generated database, which does not fully adopt the standards of completeness and transparency of institutional repositories such as the National Library of the Netherlands, which houses the Dutch historical newspaper collection.

When zooming out, the analysis shows that there are differences between cinemas in their profiles; in particular, arthouse cinemas countered the U.S. dominance in the other cinemas.[59] Over time, however, the data for all the cinemas show a decline of the share of Hollywood films, with more room for films produced in European countries (in particular from the United Kingdom, Germany, France, and Italy). Overall, films produced in other parts of the world had a very small market share; Amsterdam audiences were not widely exposed to films produced outside the United States and Europe.

At the same time, the use of country of production as an indicator of the "locality" of the films is quite limited. For example, a film such as WATERLOO (Sergey Bondarchuk, 1970) is listed as an Italian-Russian co-production (involving Dino de Laurentiis and Mosfilm), but, while having a Russian director, a Russian co-producer, and Ukraine as a shooting location, the story is set in present-day Belgium and is in English. New approaches, based on the Linked Open Data approach, provide promising avenues to approach the locality of films in a more nuanced way: connecting the screening data to Wikidata allows for the inclusion of narrative location (the country or region in which the film is set), the filming location, the country of birth and nationality of all known cast members, and the language(s) spoken in the film.[60]

58 Peter Verstraten, *Humour and Irony in Dutch Post-War Fiction Film* (Amsterdam: Amsterdam University Press, 2016), 13–14.

59 The same applies to the sex cinemas Parisien and Centraal, see Noordegraaf et al., "Discovering Cinema Typologies in Urban Cinema Cultures: Comparing Programming Strategies in Antwerp and Amsterdam, 1952–1972."

60 For a first attempt, see Julia Noordegraaf et al., "Cinema Context HoMER 2023," University of Amsterdam Library Linked Open Data, July 2023, accessed November 12, 2023, https://lod.uba.uva.nl/Cinema-Context/-/stories/cinema-context-homer-2023.

To what extent then do digital data and "scalable" research methods contribute to media historiography? On the one hand, a data-driven approach entails a renewed focus on national film culture. This is so, first, because easily extractable data are mostly available for large cities in countries with a high level of digitization, such as the Netherlands. In this sense, a data-driven approach reinstates the focus on the center at the expense of the periphery (the [capital] city versus the province; a Western European country versus the rest of the world). Secondly, the available datasets for film history also reduce the complexity of film as an artistic medium to the level of clearly demarcated data points; e.g., using the label of country of production as a marker of locality of the films. In this sense, the data used in this analysis, such as the country of production or plot keywords in IMDb, are clearly "captured" in the sense that Johanna Drucker describes,[61] and should be approached with care, as the bias in the plot keywords for the Dutch films demonstrates.

My analysis shows how difficult it is to define and capture a national cinema culture with digital data and tools. The quantitative approach, here primarily a matter of ranking and counting structured data on the films screened in Amsterdam cinemas in the three sample years, provides a macro-level image of how Dutch national film production reached local audiences in comparison to the films from other countries of production and how this trended over time. The plot keywords analysis generates a very rough indication of national film production which, as the Dutch case shows, is heavily biased towards specific genres, and as such can only be used heuristically, as an invitation to zoom in to the level of the actual films shown, which can then be analyzed qualitatively. The Linked Data analysis showed avenues for further research that complicate the idea of national cinema by taking into account more fine-grained aspects of locality, such as the nationality of cast members, the language spoken, and the narrative and filming locations. And even then the need for proper source criticism in the traditional historiographical sense remains a requirement, as user-generated content (IMDb, Wikidata) is never complete nor flawless.

A scalable research framework should allow researchers to navigate between different levels of analysis, from the detailed level of the scanned source to the visualization of trends in the data in graphs and charts. At the same time, it should be transparent in providing information on the origin and processing of the data used for such visualizations. It should function as a heuristic tool, identifying areas to explore via in-depth, qualitative research. The Arclight tool developed by Hoyt et al. is based on such an approach. Arclight presents graphs that show how entities

61 Johanna Drucker, "Humanities Approaches to Graphical Display," *Digital Humanities Quarterly* 5, no. 1 (2011), http://www.digitalhumanities.org/dhq/vol/5/1/000091/000091.html.

trend in the overall Media History Digital Library corpus, over time and in combination with other entities, while its connection with the search environment Lantern allows users to see results lists with snippets of the texts and the option to view the scan of the original source page. As such, Arclight facilitates a research process that "combines abstraction and granularity; users can read fine details while situating them within the larger corpus and in relation to other entities."[62] In this sense, Arclight has incorporated the need of most humanities scholars to be able to do some form of reading of the data, "zooming in and out of details [. . .] alternating between distant reading and close reading."[63] As I have shown in this chapter, such a scalable research process is essential for understanding local historical cinema cultures in a digital workflow.

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62 Hoyt et al., "Searching, Mining and Interpreting Media History's Big Data," 417.

63 Hoekstra and Koolen, "Data Scopes for Digital History Research," 82.

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