Foreign and Domestic Interaction in the Early Modern Printmaking Network

Matthew Lincoln
Department of Art History & Archaeology
University of Maryland, College Park

Research Questions

As printmaking became more and more popular in the Netherlands between 1500 and 1750, how did large-scale patterns of connection change between designers, plate cutters, and publishers? Specifically, when did Dutch artists tend to connect with foreign, versus domestic collaborators? How does the Dutch pattern of connection compare to other national schools?

Method: Print Collection to Network

From the *Small Landscapes* series, designed by Peter Paul Rubens, engraved by Schelte à Bolswert, published by Gillis Hendricx, c. 1638. British Museum.
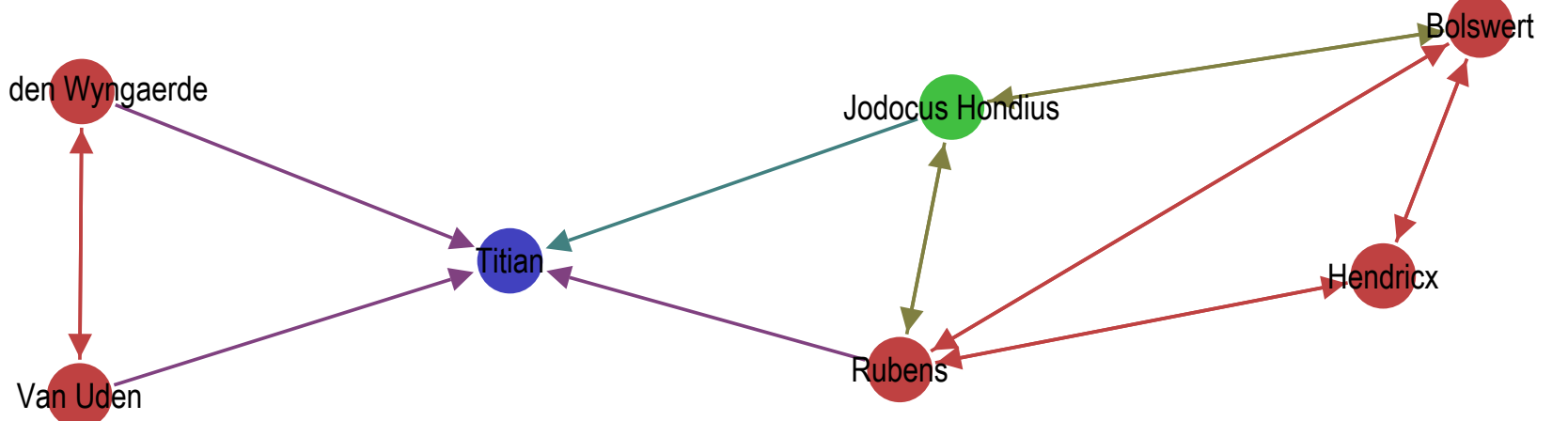
A small network inferred from four prints. The nodes are colored according to nationality.

Drawing from the British Museum's Linked Open Data repository, I created a dynamic network model in which artists are connected when they are associated with the production of a print in one of three roles: designer (either as an active participant, or simply "made after"), printmaker, and/or publisher.

Using the `iGraph` package for R, I created subsets of the network using a ten-year-long rolling window. For each "time slice" of the network, I calculated certain measures at the network, national, and individual scales.[1] Plotting the trends in these measures helps us understand changes in network structure over time.
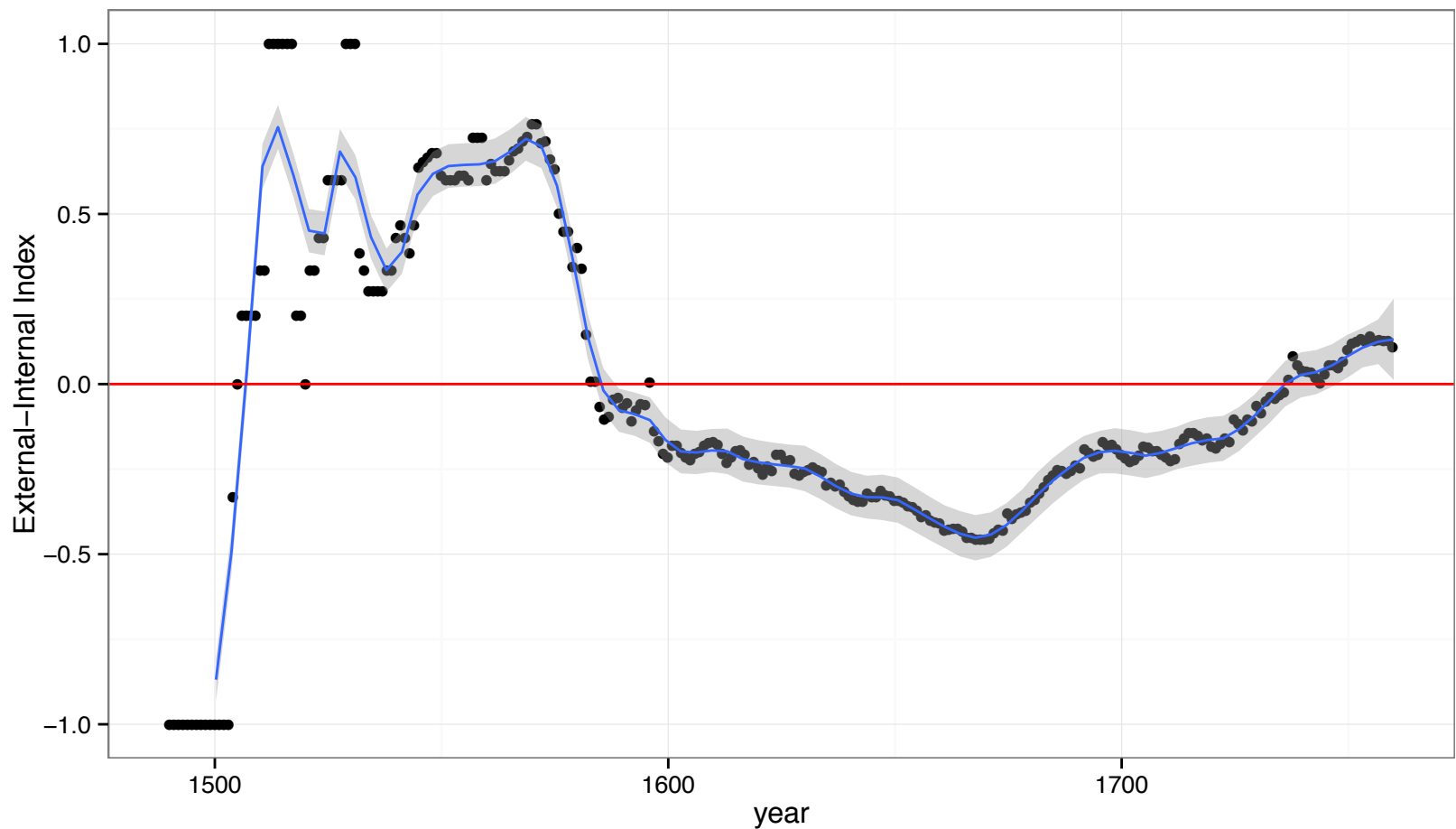
Group-External/Group-Internal Index

The group-external/group-internal index measures the balance between connections actors make within a given group (e.g. artist nationality) versus those they make to actors outside that group.[2]

$$\text{E-I index} = \frac{e - i}{e + i}$$

e: number of external connections
i: number of internal connections

- EI index = 1: Only external connections
- EI index = 0: Equal number of internal and external connections.
- EI index = -1: Only internal connections

[1] Csardi, G., and T. Nepusz. "The Igraph Software Package for Complex Network Research." *InterJournal Complex Systems* (2006): 1695. http://igraph.org

[2] Krackhardt, David, and Robert N. Stern. "Informal Networks and Organizational Crises: An Experimental Simulation." *Social Psychology Quarterly* 51, no. 2 (June 1, 1988): 123–40. doi:10.2307/2786835.

Results

The EI index of Dutch artists between 1500-1750. Positive values indicate more external connections, while negative values indicate more internal connections.

Dutch artists primarily connected to foreign collaborators up until the 1570s. While the number of prints produced in each year increased only gradually, Dutch printmakers *rapidly* shifted inwardly during the 1580s. Between ½ to ¾ of their connections would be to fellow Dutch printmakers during the seventeenth century.
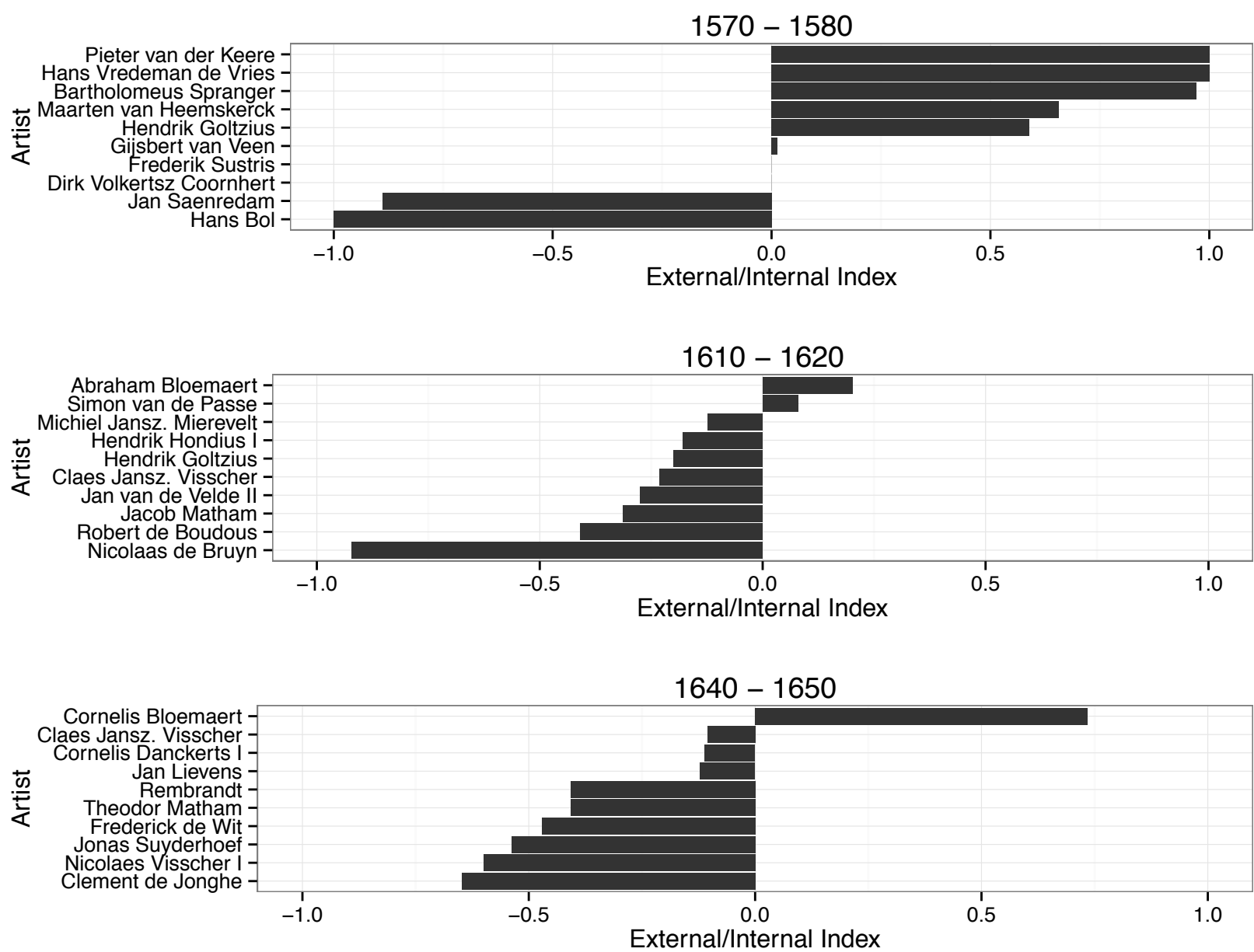
The ten most central artists in the Dutch printmaking network between 1570-1580, 1610-1620, and 1640-1650, with their mean EI indicies for each period.

Plotting the EI indicies of the most central artists over this time period illustrates how this balance of However, some artists defied national trends in any given period. Although Dutch printmakers made the majority of their connections in 1570 with foreign collaborators, some like Hans Bol worked exclusively with fellow Dutch artists. On the other hand, in the 1640s, Cornelis Bloemaert, an engraver who did most of his work in Rome, made far more foreign connections than did his contemporaries.

International Comparisons
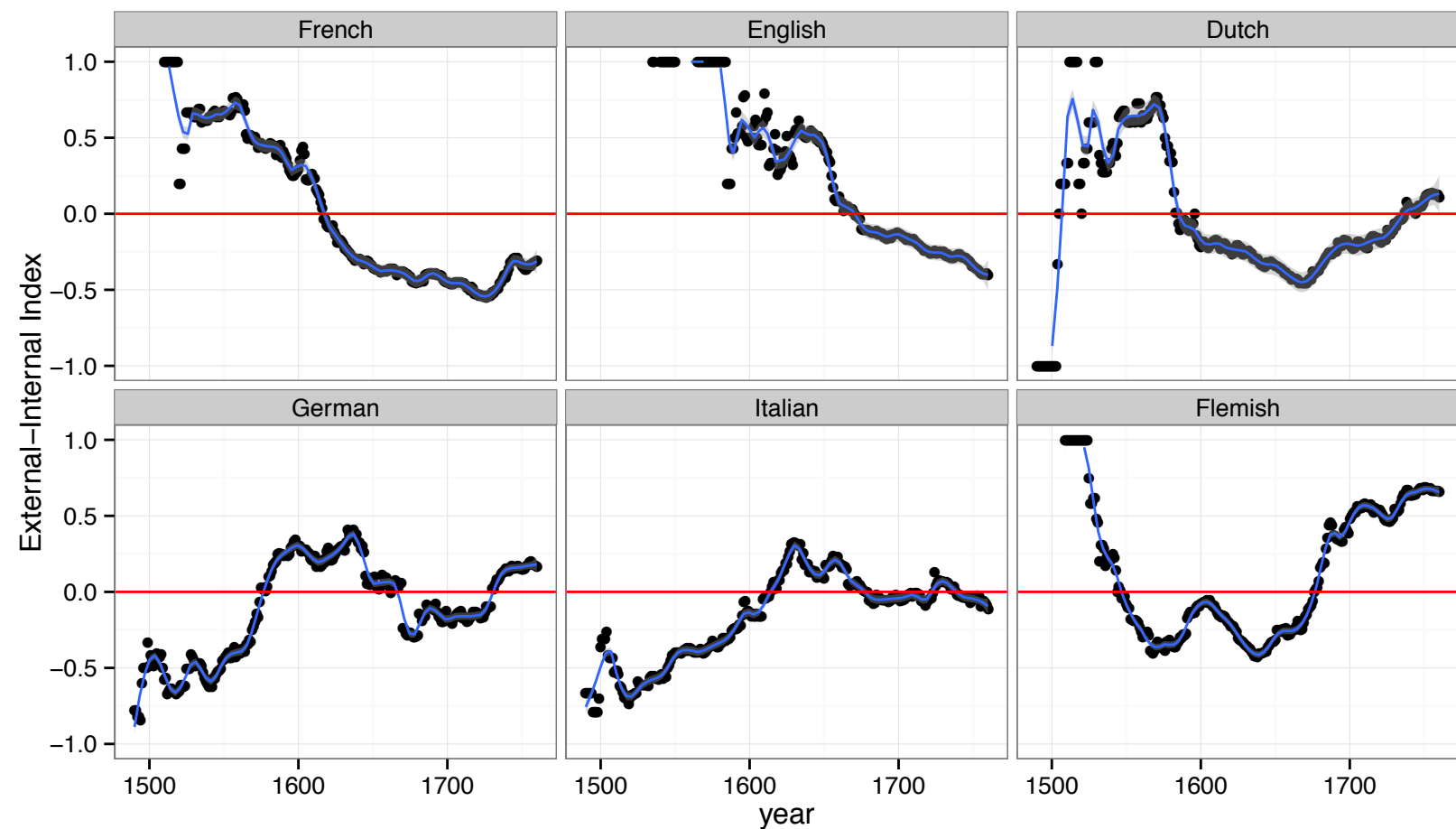
Comparison of the EI indicies of French, British, Dutch, German, Italian, and Flemish artists between 1500-1750.

We observe the same rapid shift from majority-external to majority-internal connections in the French, English, and Flemish printmaking networks as well, each occurring at slightly different points. Conversely, German and Italian printmakers initially connected mostly inwardly, only gradually shifting towards majority-external connections around the turn of the seventeenth century.

Conclusions

These results suggest that artists from regions associated with the birth of printmaking tended to connect inwardly, while artists in areas *without* an established print infrastructure initially had to look beyond their home countries to find collaborators, at least until a critical mass of domestic printmaking potential had developed. Art historians should take these structural constraints into account when considering why particular artists pursued styles or subjects attractive to an international audience, versus those attractive to a domestic one.

(L) Hendrick Goltzius after Bartholomeus Spranger, *The Wedding of Cupid and Pysche*, 1587. National Gallery of Art.
(R) Simon Frisius after Matthijs Bril, published by Hendrick Hondius, *Topographia Variarum Regiorum*, 1614. British Museum.

It is also remarkable that shifts towards majority-domestic connections were precipitous, rather than gradual. Early modern printmaking networks tended towards a *punctuated equilibrium* pattern of structural change similar to many other types of complex systems.[3] The seemingly-gradual growth and decline of print production between 1500–1750 masks more dramatic structural changes that should be taken into account when interpreting individual artists' strategies.

[3] Gersick, Connie J. G. "Revolutionary Change Theories: A Multilevel Exploration of the Punctuated Equilibrium Paradigm." *The Academy of Management Review* 16, no. 1 (January 1, 1991): 10–36. doi:10.2307/258605.