

# Graeco-Egyptian Naming Practices: A Network Perspective

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**R**EGARDING GRAECO-ROMAN EGYPT, there is a long-standing tradition of onomastic research in Leuven. At the basis lie the enormous efforts put into the *Prosopographia Ptolemaica*, a Who's Who of people in the Ptolemaic empire that started out in the 1950s, and, since 2010, its successor, the *Trismegistos People* database, which incorporates all individuals attested in documentary texts from Egypt between 800 B.C. and A.D. 800. Personal names are the result of conscious choices made by parents, and were used strategically to place an individual in a family and social context. In antiquity, their meaning and etymology played an important role, expressing qualities as well as religious and cultural affinities. Just as today, certain trends can be discerned, e.g. the popularity of double names among the local elite in Roman Egypt, or the rise of Biblical names linked with the spread of Christianity in the fourth century.<sup>1</sup> Onomastics therefore provides an interesting approach, not only for the study of personal identities, but also of society at large.

In the last decade research has leaped forward, thanks to the large amount of data made available in open access repositories. With the help of Named Entity Recognition,<sup>2</sup> over

<sup>1</sup> Y. Broux, *Double Names and Elite Strategy in Roman Egypt* (Leuven 2015); M. Depauw and W. Clarysse, "How Christian was Fourth-Century Egypt? Onomastic Perspectives on Conversion," *VigChr* 67 (2013) 407–435.

<sup>2</sup> M. Depauw and B. Van Beek, "People in Greek Documentary Papyri: First Results of a Research Project," *JfurP* 39 (2009) 31–47; see now also Y. Broux and M. Depauw, "Developing Onomastic Gazetteers and Proso-

375,000 references to Greek, Egyptian, and Latin names were distilled from the full text of some 50,000 Greek papyri and ostraca found in the Duke Databank of Documentary Papyri,<sup>3</sup> and were added to the Trismegistos database. Quantification in the form of traditional line or bar graphs portraying chronological, geographical, and thematic distributions have allowed us to chart the spread and evolution of certain types of names and other identification methods on a large scale.<sup>4</sup>

The Trismegistos team is now ready to take things another step further. My colleague Silke Vanbeselaere and I have started to explore the possibilities of network visualization and analysis for the Trismegistos data. Social Network Analysis [SNA] was developed in 1960s mathematics, anthropology, and sociology; it measures structural forms of relations between individuals.<sup>5</sup> Over the past couple of decades this method has found its way into numerous other fields, such as physics, neuroscience, and recently also (modern) history. SNA is slowly picking up momentum in ancient history as well, with networks distilled from cuneiform archives, ancient authors (on Pericles and Alexander the Great), and Byzantine papyri.<sup>6</sup>

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pographies for the Ancient World through Named Entity Recognition and Graph Visualization: Some Examples from Trismegistos People,” in L. M. Aiello and D. McFarland (eds.), *Social Informatics. SocInfo 2014 International Workshops* (Heidelberg 2015) 304–313.

<sup>3</sup> Now incorporated in the Papyrological Navigator: [www.papyri.info](http://www.papyri.info).

<sup>4</sup> See n.1 above, and e.g. S. Coussement, *Because I am Greek: Polyonymy as an Expression of Ethnicity in Ptolemaic Egypt* (Leuven, forthcoming); Y. Broux and M. Depauw, “The Maternal Line in Greek Identification: Signalling Social Status in Roman Egypt,” *Historia* 64 (2015) 467–478.

<sup>5</sup> For an introduction to SNA see A.-L. Barabási, *Linked: The Science of Networks* (Cambridge [Mass. ] 2002).

<sup>6</sup> C. Waerzeggers, “Social Network Analysis of Cuneiform Archives: A New Approach,” in H. D. Baker and M. Jursa (eds.), *Proceedings of the Second S'TART Conference* (forthcoming); D. Cline, “Six Degrees of Pericles: Social Network Analysis in Ancient History,” ([https://www.academia.edu/1991098/Six\\_Degrees\\_of\\_Pericles\\_Social\\_Network\\_Analysis\\_in\\_Ancient\\_History](https://www.academia.edu/1991098/Six_Degrees_of_Pericles_Social_Network_Analysis_in_Ancient_History)), and “Six Degrees of Alexander: Social Network Analysis and

The application of these techniques is not restricted to social networks of individuals, however. In archaeology, network analysis is used to reconstruct settlement and trade patterns on the basis of pottery, for example, and Collar has examined the cult of Jupiter Dolichenus and its link to military networks of the Roman Empire by analyzing the distribution of inscriptions dedicated to the god.<sup>7</sup>

This paper applies SNA to names. It explores the possibilities of a network approach and how this can provide a fresh perspective on the study of names and naming practices. This implies a different method of quantification and visualization, with centrality measures, edge weight, reciprocity, etc. Looking at names from this angle can provide us with new insights into the cultural identity and the social status of their bearers.

### *The data*

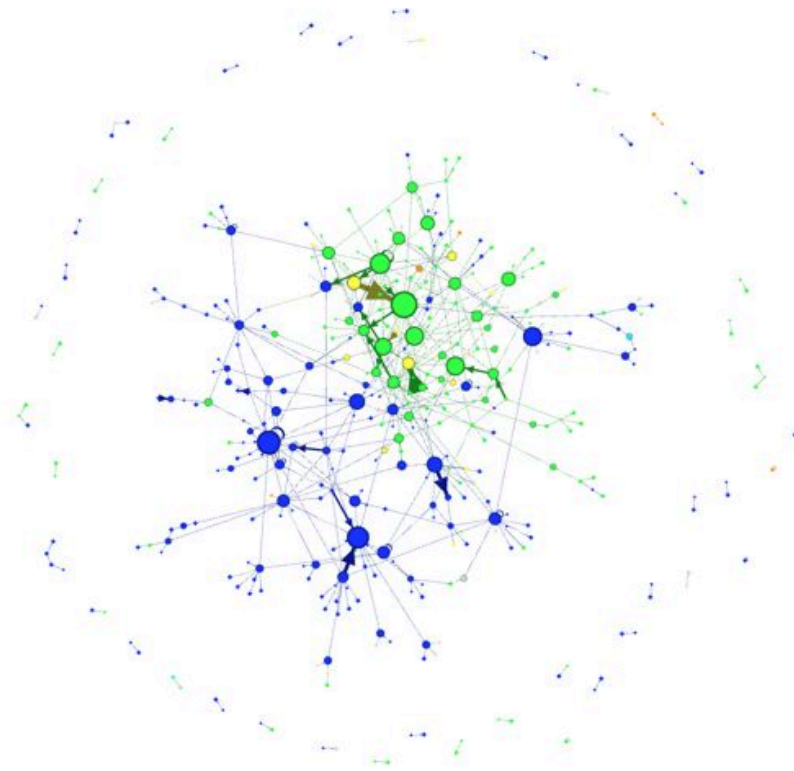
To illustrate the possibilities of SNA for onomastics, I set up a network of names from Hermopolis derived from papyri dating to A.D. 101–130. Hermopolis Magna was a district capital (metropolis) on the border of Upper and Lower Egypt. Enough texts survive for a decent sample survey, dealing with both the metropolis and the countryside belonging to this district. The choice of A.D. 101 and A.D. 130 was deliberate. By the beginning of the second century, the reformation of the internal structure of the *Aegyptii*, the lowest legal class in Egyptian society, had been accomplished. ‘Those of the gymnasium’ and the *metropolitai* were by then required to register in the metropolis, a fact which, interestingly enough, seems to be reflected in the data set. Second, the Greek polis Antinoopolis was founded in A.D. 130 facing Hermopolis on the opposite bank of the Nile. After this date, it is not always

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Ancient History,” *AHB* 26 (2012) 59–70; G. Ruffini, *Social Networks in Byzantine Egypt* (Cambridge 2008).

<sup>7</sup> A. Collar, “Military Networks and the Cult of Jupiter Dolichenus,” E. Winter (ed.), *Von Kummuh nach Telouch: Historische und archäologische Untersuchungen in Kommagene* (Bonn 2011) 217–245.

clear which texts originate from Hermopolis and which from the polis. Since Antinoopolis was populated by people from all over Egypt (Greeks from the Arsinoite district, veterans of the Roman army, citizens of other Greek cities), their different onomastic habits could distort the Hermopolitan data. However, the method is of course applicable to other areas and time periods as well.



*Figure 1: Hermopolite network of names, without isolates (nodes are sized according to their number of links [i.e. their frequency], and colored according to the linguistic origins of the names)*

The 337 texts from this period mention 1628 individuals.<sup>8</sup> They carry 606 different names,<sup>9</sup> which form the basis of the network (= the nodes).<sup>10</sup> Links (= edges) are formed by genealogical connections on the level of the individual, and the network is directed: there is an edge from name A pointing to name B if a person with name A chose name B for his/her child. E.g. in a contract from A.D. 121 there is a Dios son of Heron,<sup>11</sup> so there is a link from the name Heron to the name Dios in our network. In a private letter is found a Heraïdous daughter of Apollonios and Aline,<sup>12</sup> so there is a link from both names Apollonios and Aline to the name Heraïdous. If a person carries a double name, the two names are each linked to the related name(s) individually as well; e.g. with Menodoros-Ammonios son of Dioskoros there is a link from Dioskoros not only to Menodoros but also Ammonios.<sup>13</sup> Finally, the network is also weighted, meaning that some links are attested more than once, since it is possible that, for example, several men called Horion named a son Hermaïos.<sup>14</sup>

Of these 606 names, 180 appear to be isolates, i.e. they are not linked to any other name, or the genealogical information of the people with these names is simply not attested in our

<sup>8</sup> People have been identified across texts as far as the evidence permits. Some individuals, however, are known only by name, so when the identification is not certain, they are counted separately. For the actual analysis, these isolates are filtered out (see below).

<sup>9</sup> Names that are too damaged for onomastic analysis have been left out.

<sup>10</sup> I.e. names, not persons, form the basis of the network. The links between the names are distilled from personal (family) relations, however, so in this respect prosopography does play a part.

<sup>11</sup> [www.trismegistos.org/person/119674](http://www.trismegistos.org/person/119674).

<sup>12</sup> [www.trismegistos.org/person/260005](http://www.trismegistos.org/person/260005).

<sup>13</sup> [www.trismegistos.org/person/119682](http://www.trismegistos.org/person/119682).

<sup>14</sup> If however a person and his father are attested multiple times (e.g. Hermaïos-Phibion son of Ammonios appears in four different texts), the link between these names is only counted once, since the bestowal of a name by a parent is generally a once-in-a-lifetime event.

documentation. After removing these isolates from the original network, 426 different names remain, based on 514 individuals with at least one genealogical identifier.<sup>15</sup> These names are connected by means of 546 links (*fig. 1*).<sup>16</sup>

#### *Network structure*

To get a better overview of the structure of the network, the nodes were colored according to the linguistic origins of the names (*fig. 1*): blue for Egyptian names, green for Greek, yellow for hybrid (names combining elements of different languages, e.g. Ὠρίων, where the Egyptian *Hr* [the god Horos] is combined with the Greek ending *-ιων*; or Σεναπολλῶς, a theophoric name where the Egyptian prefix *Sen-* [‘the-daughter-of’] is added to the Greek god Apollo), orange for Latin names, turquoise for Semitic, and grey for names of unknown linguistic origin.<sup>17</sup> This results in a clear division of the giant component (i.e. the main connected cluster in the center) into a predominantly Egyptian (left) and a predominantly Greek zone (right). The Egyptian part is more homogeneous, with only a couple of Greek names and a single Latin one, while the Greek part contains more names of varied linguistic origin. Many of the most popular names are also situated in the latter component.

While this is a directed network, name popularity is measured by the in-degree of a name, i.e. the number of links pointing to it, since this is the direction indicating the name choice by parents.<sup>18</sup> Hermaios is the most popular name in this

<sup>15</sup> 478 with a patronymic (the standard identifier), 4 with a metronymic, and 36 with a patronymic and metronymic, or 1072 name attestations in all.

<sup>16</sup> The visualization of the final network can be found at [www.trismegistos.org/network/1](http://www.trismegistos.org/network/1), where it is possible to zoom in on specific names and their surroundings.

<sup>17</sup> All visualizations and measures were performed in Gephi, a free, open-source software designed specifically for network analysis.

<sup>18</sup> The in-degree is also weighted: if a link between two names is attested more than once, it is counted multiple times.

network. This comes as no surprise, since Hermes was the patron god of the metropolis, called *Hermou polis* in Greek. Other common names, like Ammonios, Sarapion, and Achilles, were popular all over Egypt. The popularity of Orsenouphis and Pachoumis (and its female counterpart Senpachoumis) on the other hand is unexpected. These names were more popular to the south of Hermopolis, i.e. in the Panopolites district.

On closer inspection, almost half of the texts from this period belong to the archive of Apollonios, a Hermopolitan who at one point in his career took up the office of *strategos* in the Apollonopolites Heptakomias district, some 100 kilometers to the south. After his term there ended, he took a great many official reports home with him, and they ended up in his personal archive. The dichotomy in this network is therefore an indication of different naming practices in the metropolis and in the countryside. The Egyptian component mainly represents the naming patterns found in the texts from the Apollonopolites Heptakomias countryside, while the Greek component reflects the traditions as recorded in Hermopolitan documents. Furthermore, this network can help us determine how names were perceived by their contemporaries.

#### *Naming patterns*

In what follows, the characteristics of the two components are set out, to see whether specific naming patterns can be discerned. To determine which nodes belong to which of the two components exactly, I used the Louvain community detection algorithm<sup>19</sup> to demarcate the two clusters in the giant component (*fig. 2*). The Egyptian segment (the red nodes) is the bigger of the two, with 175 names. The predominantly Greek part (the purple nodes) is smaller, with 157 names, but seems slightly more connected. Its degree measures and the local clustering coefficients confirm this.

<sup>19</sup> See <http://spaghetti-os.blogspot.be/2014/04/community-detection-in-networks-and.html>.



*Figure 2:* Community detection in the giant component:  
Egyptian (red) vs Greek (purple)

The average degree (i.e. the average number of links that a name has)<sup>20</sup> of the Greek component is slightly higher than that of the Egyptian one (1.66 vs 1.33 respectively), a first clue for more cohesion in this part of the network. In other words, people with Greek names chose from a more limited onomastic set. However, the average degree does not take into account the direction of the links. The direction is important here, however, for it is an indication of the popularity and common-

<sup>20</sup> Again, the weighted in-degree has been calculated, to take into account links that are attested more than once.



ality of a name. The in-degree of the names (i.e. the names of the children) is therefore more revealing. In the Greek part, the in-degree ranges between 0 and 18, and 18 of the names in this component (11%;  $n = 157$ ) have an in-degree of 5 or higher. The in-degree of the names in the Egyptian component ranges between 0 and 15, and there are only 9 names (9%;  $n = 175$ ) with an in-degree of at least 5.

Comparing the density of these two components, i.e. the percentage of possible links that are actually present in each section, yields no significant results (1.4% for the Egyptian component vs 1.9% for the Greek part).<sup>21</sup> The local clustering coefficient, however, is more meaningful in this respect. It measures the cohesion within parts of a network, by calculating how connected the neighbors of a given node A are. This results in a figure between 0 and 1, whereby 0 means that none of node A's neighbors are connected to each other (only to A itself), while a clustering coefficient of 1 implies that all neighbors are connected to both A and each other. Only 10% of the names in the Egyptian part have a clustering coefficient higher than 0, ranging between 0.003 and 0.5, while in the Greek component 19% of names range between 0.02 and 1. This higher local clustering again suggests that in families with a preference for Greek names there was a higher tendency to stick to the same set of names.

Additionally, in the Greek component there are more edges with a weight of more than 1 (13 as opposed to only 6 in the Egyptian part; see Table 1). This means that two different persons called Dios, for example, named their sons Heroides. The higher edge weight of these name combinations indicates that they appear in different generations and families. Reciprocity is also higher in this part of the graph, with 10 name pairs with reciprocated ties, against 5 among the Egyptian component.

<sup>21</sup> For the mathematics behind SNA measures see S. Wasserman and K. Faust, *Social Network Analysis: Methods and Applications* (Cambridge 1994).

<b>GREEK COMPONENT</b> <b>157 names – 243 links</b>	<b>EGYPTIAN COMPONENT</b> <b>175 names – 224 links</b>
<b>Edge weight &gt;1</b>	
Dios → Heroides (2)	Psenosiris → Psehathyris (2)
Heroides → Sarapion (2)	Miysis → Trompkoimis (2)
Achillion → Hermaios (2)	Thotsytmis → Herieus (2)
Achilleus ↔ Esoeris (2)	Petosiris → Orsenouphis (3)
Achilleus → Hermas (2)	Horos → Mersis (3)
Apollonios → Eudaimon (2)	
Hermaios → Eudaimon (2)	
Ammonios → Horion (2)	
Ammonios → Ammonios (2)	
Ammonios ↔ Totoes (2)	
Harpaesion → Achilleus (2)	
Horion → Hermaios (4)	
<b>Reciprocal ties</b>	
Eutychides ↔ Sarapion	Pachoumis ↔ Hartbos
Achilleus ↔ Esoeris	Pachompsais ↔ Psenosiris
Totoes ↔ Ammonios	Pnasis ↔ Petemenekysis
Ammonios ↔ Hermaios	Ophieus ↔ Horos
Hermaios ↔ Kastor	Horos ↔ Pachomios
Eudaimon ↔ Hermas	
Achilleus ↔ Eudaimonis	
Dioskoros ↔ Harpokration	
Sarapion ↔ Areios	
Kastor ↔ Panechotes	

Table 1: Edge weight and reciprocal ties in the Greek vs the Egyptian components

This reflects the tradition of passing names down from grandfather to grandson, e.g. Dioskoros, son of Harpokration, grandson of Dioskoros.

These characteristics could be explained from a social point of view. The Greek component reflects the naming traditions in the documents from the metropolis, where the local elite

mainly resided. From the 60s A.D. onwards, elite membership was strictly hereditary,<sup>22</sup> so descent was of prime importance to these people. Since family names did not exist, limiting themselves to a specific collection of names was a way of expressing family and community ties. The clustering of common names, the greater cohesion, and the higher reciprocity in this segment could all point to such a motive. Moreover, by choosing Greek names the local elite could be making a statement that they considered themselves to be Greeks and thus culturally superior to Egyptians, who did not have access to the gymnasium or the metropolitan offices.<sup>23</sup>

The onomastic pool of the Apollonopolites Heptakomias region is, on the other hand, more varied. It consists of more names, and the degree is more evenly spread, with less-common names. The lower cohesion and reciprocity suggests that there was more freedom in the choice of names, and that these people were less bound to status and convention.

*Linguistic origin vs linguistic affiliation*

In Trismegistos, names are classified according to their linguistic origins on the basis of their semantics, morphology, and syntax: an Egyptian name refers to Egyptian gods by means of Egyptian lexemes and morphemes. Some names, however, especially some Egyptian ones, were clearly not perceived as such by contemporaries, and were even accepted by the local elite. Networks like these can therefore help us evaluate the perception of names in antiquity on the basis of their location in the graph.

Names such as Totoes, Mireses, and Panechotes are classified in the Greek component, but they have just as many links with names in the Egyptian section, so these are clearly borderline

<sup>22</sup> Y. Broux, "Creating a New Local Elite: The Establishment of the Metropolitan Orders of Roman Egypt," *ArchPF* 59 (2013) 145 ff.

<sup>23</sup> Even though there was no actual connection with Greece, as the local elite descended from immigrants that intermarried with Egyptians hundreds of years before, or even from promoted Egyptian families.

cases—perhaps remnants of promoted Egyptian families? Esoeris, on the other hand, is linked to Greek names only, and thus seems to be accepted as a ‘proper’ name by the metropolitan community. Moreover, many of these Egyptian names belong to women (Taseus, Senhyris, Taumesis...): they account for 36% (n = 25) of all female names in the Greek component, while among the male names only 19% (n = 114) are Egyptian. Bingen had already noticed this discrepancy, which can be related to status;<sup>24</sup> now it can be quantified.

The Greek names found in the Egyptian component can be classified in two ways: those referring to Egyptian gods, like Paniskos, Hierax, and Hierakion,<sup>25</sup> and hypocoristics of popular Greek names, e.g. Achillas (> Achilleus), Alexas (> Alexandros), Asklas (> Asklepiades). There are no female Greek names in this component.

Hybrid names, i.e. composed with elements of different languages, such as Horigenes (a compound referring to the Egyptian god Horos and the Greek element -γενης), form another interesting category. Only two are exclusively connected to Egyptian names; these are again hypocoristics (Osarpasas and Harpokras). Those situated mainly in the Greek component generally consist of an Egyptian god with the Greek derivational suffix -ίων, e.g. Anoubion, Harpokration, or Horion. Hybrid names are clearly also a metropolitan phenomenon. Moreover, the practice arises only in the Roman period, and follows the same chronological evolution as double names,<sup>26</sup> so they might perhaps also be linked to elite naming practices.

<sup>24</sup> J. Bingen, “Notables hermopolitains et onomastique féminine,” *ChrEg* 66 (1991) 324–329: women belonged to the private sphere, which, even among the local elite, was often more Egyptianized than the public façade leads us to suspect. The same disparity between male and female naming practices is noticeable for double names in the Roman period (see Broux, *Double Names*).

<sup>25</sup> The falcon (ἰέραξ) was the sacred bird of Horos.

<sup>26</sup> Broux, *Double Names* 101–104.



Figure 3: Central part of the Hermopolite network  
(nodes are sized according to betweenness centrality)

Names with high betweenness centrality form bridges between the two components of the network. Betweenness centrality does not measure how many direct links a node has, but rather how often other nodes have to go through it to reach each other.<sup>27</sup> Names like Hermaios and Ammonios, with a high degree centrality, obviously also score high when it comes to betweenness, since they are linked to many names (*fig. 3*). But as they are embedded in the Greek component only, it is more interesting to look for those with high betweenness connecting the two components. Totoes, Horion, Horos, Apollonios, and Dioskoros all refer to popular (Graeco-) Egyptian gods (i.e. Tutu, Horos/Apollo, and the twins Kastor and Pollyx respectively); their intermediate position is therefore unsurprising. The same applies to Hermias and Pathotes, as they refer to

<sup>27</sup> E.g. the name Pankollauthes is not linked directly to the name Harpokration, but has to go through Aphrodisios (so there is a Harpokration, son of Aphrodisios, grandson of Pankollauthes).

the patron god of the metropolis and the district, Hermes/Thoth. In a way, these central names offer the ‘best of both worlds’, not as hybrid names in grammatical form, but rather pragmatically. It would be interesting to compare these results with networks from other regions to check whether this was indeed a global Egyptian phenomenon, and if these intermediary names can perhaps be linked to a specific population group, such as the *metropolitai*.

Finally, this network could in a similar way also help determine the linguistic value of those names whose the meaning is unclear (they are now marked as ‘unknown’). Names like Spagies/Spagietes, Tenanes, and Koulo contain no recognizable morphological elements, but they are situated deep in the Egyptian component, and so are most likely also Egyptian in origin. Psynis was classified as ‘uncertain’: short names beginning with ψ, like Ψυχῆς and Ψύλλας, are often Greek, yet its location in the Egyptian component suggests otherwise. Perhaps it is a hypocoristic of a Ψσεν-, Greek rendering of the Egyptian element *P3-šr-n-* (‘the-son-of-’)? The same might apply to Pemous, which resembles Egyptian names, such as Petemounis.

Unclassified names in the Greek component include Skimbix, Eskas, and Kilminos, which have a Greek ring to them, while Thetoperis and Apiteios seem to contain Egyptian elements (*T3-di-* [‘the-one-given-by’] and the Apis bull respectively). Still others, such as Narch and Epis, are abbreviated, and they indeed resemble Greek names the most (Nearchos or Narcheros? Epistratos?). For cases like these, a more elaborate network, including names from more districts, could provide a clearer picture.

A more comprehensive and thorough analysis of this collection of names is obviously possible. Networks like this one can be used to compare the relations between the theophoric names and the local pantheons in multiple districts, or even, once similar onomastic databases are available for other parts of the Mediterranean, in multiple regions. The hybrid names and hypocoristics briefly discussed here could form the object

of a study in itself. The relation between names and status could be explored more in depth by focusing on specific archives or types of document and by adding more details concerning the social class of the bearers to the network. And by generating more networks on the basis of earlier and later data, changes in these religious and social identities can be plotted over time. The purpose of this paper, however, was simply to demonstrate the possibilities of SNA and how it can enhance onomastic research in addition to traditional methods. This approach, moreover, is not restricted to the Egyptian data presented here. It can be applied to any substantial onomastic corpus, regardless of its chronological and geographical framework. In Leuven, Trismegistos will certainly explore this path further, and hopefully this survey will persuade others to give networks a try as well.

*March, 2015*

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