

Invisible Agents: Networks of Learning in Late Antiquity

1. INTRODUCTION

In late antiquity, a pedagogue was a carer and teacher introduced to young children. Studies on late antique education systems have not fully explored their position within their large educational networks, though scholars such as Noel Lenski have laid the foundations for this enquiry. This project started to look at the numerous letters of one well-connected teacher of rhetoric, Libanius (c. 314-c. 393), and create visual representations of his connectivity and that of the pedagogues around him, particularly unnamed pedagogues. As Libanius wrote approximately sixteen hundred letters, many of which have been translated into English by scholars, his letters offer a unique amount of detail. By studying his letters in conjunction we can begin to understand much about the role of unnamed pedagogues in late antiquity.

2. AIMS

The broad aims of this project were to begin to understand how these low-status, often unnamed individuals functioned within the broader educational network of late antiquity. To achieve this, there were smaller aims established:

1. Read through Libanius' letters, as translated and grouped together by Raffaella Cribiore and chart them into a Microsoft Excel spreadsheet with as much detail as possible. The information is already more accessible in this format and summarises key details.
2. Next, we aimed to visualise this information and Libanius' networks by learning how to use ConnectTheDots, which creates graphs from spreadsheets allowing easy network analysis (examples below in Fig. 1. and Fig. 2.), and assess the value of network analysis for this.
3. With these graphs, we aimed to begin making conclusions about how educational networks interlinked with the social, and how connected pedagogues were, and the nature of their role.

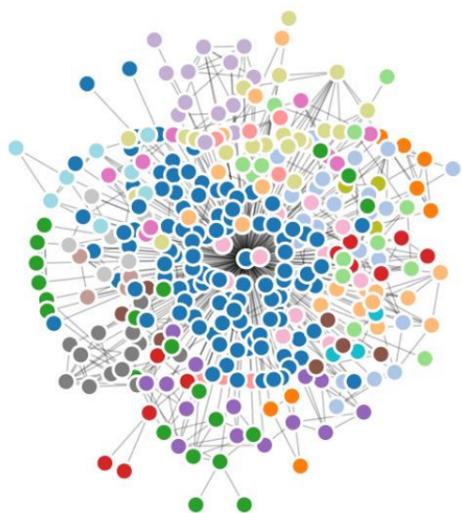


Fig. 1. (above) A ConnectTheDots graph illustrating every connection that was recorded from every letter read over the course of this study. Each node is an individual.

Node	Degree	Centrality
Libanius	304	0.982
Albanus	15	0.001
Hyperechius i	12	0.001
Dionysius	10	0
Caesarius ii	8	0

Fig. 2. (above) Fig. 1.'s accompanying information. Degree is the number of immediate connections, centrality scores how much of a 'connector' each node is (the higher, the more connected).

3. METHODOLOGY

First, I read through a selection of letters which featured the word 'pedagogue' when filtered. Information about these letters was plotted into the Excel spreadsheet, with particular care paid to the relationships mentioned within the text. Every relationship mentioned was plotted on a separate line so that it would map properly when pasted into ConnectTheDots. For example, one letter's input looked like Fig. 3, with nine separate relationships mentioned

	A	B	C	D	E	F
1	Cribiore Ref	Summary	Letter Cat eg. ????	Source	Target	Nature of Relationship (target is ...?)
176	177	g S' son and his pe	Report, praise	Libanius	Stratonicus	Addressee
177	177			Libanius	Stratonicus' son	Student
178	177			Stratonicus	Stratonicus' son	Son
179	177			Stratonicus' son	Unnamed Pedagogue 1	Pedagogue of S' son
180	177			Libanius	Unnamed Pedagogue 1	Mentioned in letter
181	177			Stratonicus	Unnamed Pedagogue 1	Pedagogue of his son
182	177			Libanius	Priscianus 1/i	Mentioned in letter. P1/i is
183	177			Stratonicus	Priscianus 1/i	Mentioned in letter, 'Relative and governor'
184	177			Stratonicus' son	Priscianus 1/i	Mentioned in letter, 'Relative and governor'

Fig. 3. (above) A section of the spreadsheet illustrating how relationships were input on separate rows, with some surrounding information. More columns exist for referencing, geographical information, and notes which are not present in the screen capture.

- After that, letters were examined and plotted into the spreadsheet in order of appearance within Cribiore, resulting in a spreadsheet of over 800 lines. Then, I began to group the letters relevant to our current interests. In Cribiore, the letters were often grouped in a dossier. Often, an unnamed pedagogue would be mentioned in a letter within a dossier, but not the others, although the others inform us about the students' connections and hence the pedagogue's. For example, Unnamed Pedagogue 1 features in one letter within the Dossier of the Son of Stratonicus, but the other letters within the dossier explain more about Stratonicus' son's connections and need to be linked.
- By grouping dossiers, we can understand the shape of a pedagogue's network more fully. Finally, I took each group and plotted it with ConnectTheDots. For example, Unnamed Pedagogue 1's group of relevant letters created the graph of Fig. 4.
- The final step was to examine these graphs and see what they tell us in relation to pedagogues in late antiquity, comparing them to one another.

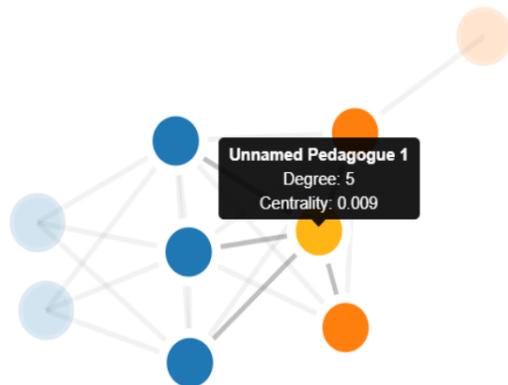


Fig. 4. (left) The graph generated from Unnamed Pedagogue 1's group of letters.

Fig. 5. (right) The accompanying information from the graph generated from Unnamed Pedagogue 1's group of letters.

Node	Degree	Centrality
Libanius	7	0.128
Stratonicus' son	7	0.128
Leontius	6	0.259
Stratonicus	6	0.083
Unnamed Pedagogue 1	5	0.009
those with whom Stratonicus' son was	4	0
Priscianus 1/i	3	0
Theodotus	3	0
Leontius' son	1	0

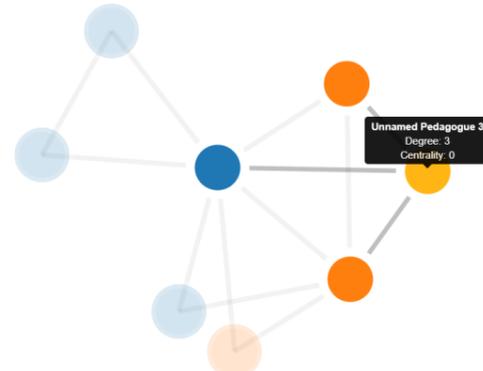
4. RESULTS AND FINDINGS

Fig. 6. (right) The graph generated from Unnamed Pedagogue 3's group of letters.

Comparing the graphs tells us much at a glance. For example, when we compare the degree (5) and centrality (0.009) of Unnamed Pedagogue 1 (Figs. 4. and 5.) to that of Unnamed Pedagogue 3 (Fig. 6.), it becomes apparent that the centrality of pedagogues can change significantly, and these graphs create more questions about why that is.

This project revealed to us that pedagogues could hold a central position within their local networks. Even the unnamed pedagogues seemed to be able to influence students, parents, and Libanius himself, although when we look at them in the broader scale they are on the fringes of Libanius' networks. Through the approach of network analysis, we can now understand the true connections of unnamed pedagogues beyond what Libanius says in his speeches. It allows us to see beneath the surface, illustrating the true value of network analysis and in representing data such as this visually.

This project has also pathed the way for further investigations with different foci. Having the letters digitised in a spreadsheet format allows for this kind of research to be easily pursued, and for varying amounts of detail to be accessed quickly depending on the needs of the researcher. Many more visual representations of this data can now be created and analysed to understand late antique educational networks, such as maps and timelines. Visual representations of texts, particularly classical texts, are more accessible to a range of scholars with various interests, encouraging research in different fields. It also makes collaborative research easier.



5. CONCLUSIONS, LIMITATIONS, REVIEW & THE FUTURE

- Due to issues with scheduling and technical difficulties, not all letters were examined. There is therefore still much that can be learned about pedagogues from looking at Libanius' remaining letters in this manner, and much that can be learned about letter-writing practices, familial relations, geographical connectivity, political connectivity and much more from the data already compiled.
- Network analysis as a method can tell us more than raw texts, but it also often results in data being overly simplified or misinterpreted. However, the spreadsheet created contains summaries which aid conclusions without omitting important information. In conclusion, network analysis is valuable for this type of enquiry despite its limitations.
- ConnectTheDots as a tool does seem simplistic compared to other tools such as Gephi or GraphCommons, so more comprehensive tools could create even more informative and visual data. This can be investigated in future studies.
- This project has laid strong foundations for future enquiries and illustrates the value of network analysis and visual data. Next, one should finish putting all of Libanius' relevant letters into the spreadsheets so that we can more fully create and analyse the networks using visual tools.

REFERENCES: - Cribiore, Raffaella. *The School of Libanius in Late Antique Antioch* (Princeton, 2007).
- Lenski, Noel. 'Searching for Slave Teachers in Late Antiquity', *ποιμνὴ λαῶν. Studies in Honor of Robert J. Penella. Revue des études Tardo-Antiques* 12.8 (2019), 127-191.

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