FACEBOOK-ING VERGIL'S *AENEID:*

SOCIAL NETWORK ANALYSIS OF A CLASSICAL EPIC

Emma Vanderpool

Presented to the Monmouth College
Classics Department
In Partial Fulfillment of the
the requirements for Departmental Honors

Dr. Thomas J. Sienkewicz,

Senior Thesis Advisor

May 10, 2017

Table of Contents

Abstract

In the summer of 2012, popular news media made note of Pádraig Mac Carron and Ralph Kenna's academic article, "Universal Properties of Mythological Networks." News of innovative – and, moreover, quantitative – evidence supporting the plausibility of Homer's *Iliad* quickly spread.[1] This claim to authenticity was based not on archaeological evidence but on *social network analysis*. This type of quantitative study of social relations between a set of actors, in terms of classical literature, has been used to reevaluate Homer's *Iliad* and *Odyssey*, various Greek tragedy, and Cicero's letters. Unfortunately, Vergil's *Aeneid* has been left to the wayside by current scholarship.

In this paper, I develop four different social networks from Vergil's *Aeneid*, a Roman epic from the first century AD about the journey of the founder of Rome, Aeneas. Static and dynamic conversational networks examine relationships between characters based on dialogue. Static and dynamic co-occurrence networks examine relationships based on the simultaneous appearance of two characters in a scene. The static networks provide a look at the *Aeneid* in its

[1] Pádraig Mac Carron and Ralph Kenna. "Universal Properties of Mythological Networks." *Europhysics Letters (EPL)* 99 (2012): 1-6. Nick Collins. "Beowulf and Iliad 'more plausible than Shakespeare,'" last modified July 25, 2012, http://www.telegraph.co.uk/culture/9423516/Beowulf-and-Iliad-more-plausible-than-Shakespeare.html. Emerging Technology from the airXiv, "The Remarkable Properties of Mythological Social Networks," last modified June 13, 2013, https://www.technologyreview.com/s/516081/the-remarkable-properties-of-mythological-social-networks/. David Meadows. "On the 'Plausibility' of the Iliad and Social Networks?" Last modified July 25, 2012. https://rogueclassicism.com/2012/07/25/on-the-plausibility-of-the-iliad-and-social-networks/. Science 2.0. "What the Iliad Can Tell Us About Science 2.0 And Networks," last modified July 25, 2012, http://www.science20.com/news_articles/what_iliad_can_tell_us_about_science_20_and_networks-92450. Joel Shurkin, "Using Social Networks to Analyze the Classics," last modified July 24, 2012, https://www.insidescience.org/news/using-social-networks-analyze-classics. John Sutherland, "Beowulf, Shakespeare and the plausibility of fiction," last modified July 25, 2012, https://www.theguardian.com/commentisfree/2012/jul/25/beowulf-shakespeare-plausible-fiction?newsfeed=true#comment-17351783.

entirety. The dynamic networks look at the individual books of the *Aeneid* and the various roles that a character may play at different points in the narrative.[2]

With these four networks in hand, four major questions are explored throughout the course of this paper.

1) What are the benefits of using quantitative social network analysis metrics and visualizations to study classical texts such as the *Aeneid*?

2) What are the benefits of using *both* static and dynamic networks to study a piece of literature?

3) Does the network in Vergil's *Aeneid* possess real-world characteristics that help to create a more convincing narrative?

4) What kind of insight can this type of analysis reveal about the roles and relationships in this epic?

Overall, I argue that the mathematical calculations involved with the generation of these networks and the accompanying visual representations can provide a more quantitative perspective on the *Aeneid*. Combined with the qualitative, close reading by scholars such as Gilbert Highet, these two approaches can provide a more holistic reading of this well-read and well-studied text.[3]

---

[2] Marjona Coll Ardanuy and Caroline Sporleder, "Clustering of Novels Represented as Social Networks," *Linguistic Issues in Language Technology (LiLT)* 12 no. 4 (Oct. 2015): 13.

[3] Gilbert Highet, *The Speeches in Vergil's Aeneid* (Princeton, New Jersey: Princeton University Press, 1972.

1. Introduction

In the beginning of the 21st century, scholars began to take advantage of the large digitized corpora of text and apply social network analysis metrics to these new aggregates of data in order to gain new perspectives. While there have been studies on Homer's *Iliad* and *Odyssey*, Vergil's classical epic, the *Aeneid* has been overlooked.[4] On the one hand, the application of social network analysis allows for new interpretations of and perspectives on character roles and relationships. On the other hand, texts such as Vergil's *Aeneid* offers the interesting opportunity to explore how a "purely artificial social network" might resemble real-life collaboration as Homer's *Iliad* and *Odyssey* have been shown to resemble.[5] A work of literature's ability to properly engage in a kind of mimesis allows the audience, who is limited in their ability to understand social cognition and how people relate to one another, to best follow the story.[6] In this paper I aim to offer quantitative analysis and visualizations of Vergil's *Aeneid* through social network analysis. Several questions drive the course of this paper, including

[4] Pádraig Mac Carron and Ralph Kenna, "Universal Properties of Mythological Networks." Ralph Kenna and Pádraig Mac Carron, "Math Meets Myths: Network Investigations of Ancient Narratives," *Journal of Physics: Conference Series* 681 (2016): 1-12, accessed April 16,2 017, doi: 10.1088/1742-6596/681/1/012002. Pádraig Mac Carron, "A Network Theoretic Approach to Comparative Mythology" (PhD diss., Coventry University, 2014).
Ralph Kenna and Pádraig Mac Carron, "A Networks Approach to Mythological Epics," in *Maths Meets Myths: Quantitative Approaches to Ancient Narratives,* ed. Ralph Kenna, Máirín MacCarron and Pádraig MacCarron. (Cham, Switzerland: Springer International Publishing, 2017). Dimitrios Kydros, Panagiotis Notopoulos, and Georgios Exarchos, "Homer's Iliad – A Social Network Analytic Approach," *International Journal of Humanities and Art Computing* 9 no. 1 (2015): 115-132. P.J. Miranda, M.S. Baptista, and S.E. de Souza Pinto, "Analysis of communities in a mythological social network," preprint. http://arxiv.org/abs/1306.2537.

[5] R. Alberich, J. Miro-Julia, and F. Rosselló, "Marvel Universe looks almost like a real social network," preprint. http://arxiv.org/pdf/cond-mat/0202174.pdf, 3.

[6] James Stiller, Daniel Nettle, and Robin I. M. Dunbar, "The Small World of Shakespeare's Plays," *Human Nature* 14 no. 4 (2003): 397-398.

1) What are the benefits of using quantitative social network analysis metrics and visualizations to study classical texts such as the *Aeneid*?

2) What are the benefits of using *both* static and dynamic networks to study a piece of literature?

3) Does the network in Vergil's *Aeneid* possess real-world characteristics that help to create a more convincing narrative?

4) What kind of insight can this type of analysis reveal about the roles and relationships in this epic?

The rest of the paper is organized as follows. In Section 2, I provide background information on social network analysis, including a survey of recent scholarship. In Section 3, I present the methods used, including key terminology, metrics, and the construction of the different types of networks. In Section 4, using these basic metrics, I define the structure of the networks used. In Section 5, I explore the question of whether or not Vergil accurately captures the real world relational characteristics in his epic by providing the necessary metrics, their results, and a close analysis and discussion of these results. In Section 6, I explore the insight that this type of analysis can provide on roles and relationships in the narrative by again providing the relevant metrics, their results, and a close analysis and discussion of these results. In Section 7, I summarize the conclusions reached as well as discuss future work.

2 Background

2.1 Introduction

Social network analysis is based upon the mathematical foundations of graph theory. In brief, this type of analysis studies individuals and their relationships. Through the study of these relationships, it is possible to trace the flow of information or resources. In this portion of the paper, there is a brief history of what social analysis is (section 2.2), a survey of the beneficial applications of these techniques (section 2.3), and lastly how it has been used with literature (section 2.4) and within the field of classics (section 2.5).[7] Lastly, there is a brief introduction to the works of Homer and, more specifically, the text at hand, Vergil's *Aeneid* (section 2.6).

2.2 What is Social Network Analysis?

Graph theory, a wide-spanning mathematical field, and *graphs* are pure mathematical tools that have been employed by social scientists in a utilitarian manner in order to produce a useful product. In the case of its application to social network analysis, the product is a new understanding of relationships. Graph theory can date its origins back to Leonhard Euler's 1735 paper on the bridges of Königsberg. By studying how one could traverse through the German city the quickest with the six bridges available, he laid the foundations for graph theory.[8] The earliest application of graph theory to social systems first appears in Jacob Moreno's 1934 book, *Who Shall Survive?: A New Approach to the Problem of Human Interrelations*. In this book, he maps out the friendships of school children.[9] He lays down the foundations for

---

[7] Diane Harris Cline, "Six Degrees of Alexander: Social Network Analysis as a Tool for Ancient History," *Ancient History Bulletin* 26 (2012): 59.

[8] Barabási, Albert-László, *Network Science*, sec. 2., p. 3. Pádraig Mac Carron, "A Network Theoretic Approach to Comparative Mythology" (PhD diss., Coventry University, 2014), 2.

[9] Pádraig Mac Carron, "A Network Theoretic Approach to Comparative Mythology," 2. J. L. Moreno, *Who Shall Survive?: Foundations of Sociometry, Group Psychotherapy and Sociodrama*. Beacon, NY: Beacon House, 1953.

sociometry, the precursor to social network analysis and the measurement of relationships in small groups, as well as for *sociograms*, basic visual depictions of relationships.[10] According to Albert-László Barabási, "rapid" growth in network science began only in the first decade of the 21st century. He credits the origins of this growth with papers by Paul Erdös and Alfréd Rényi in 1959 and Mark Granovetter's paper in 1973.[11]

Arguably the most culturally popular example of the application of social network analysis comes from psychologist Stanley Milgram. He attempted to measure the average number of steps separating two people, i.e., he attempted to discern how likely it was that, when two strangers met, they would find that they had a common friend. The average number came to six.[12] His results led to the expression, *six degrees of separation*.[13] This value can to be representative of how seemingly well-connected the world had become.

Social network analysis is also related to *network theory,* which distances itself from graph theory in terms of its empirical nature and its focus on data, function, and utility.[14] This analysis allows for the visualization and quantification of data. Network theory argues that "what happens to a group of actors is in part a function of the structure of the connections among them."[15] In other words, the relationships shared between people have an impact on the day-to-day events of their lives.

---

[10] Stanley Wasserman and Katherine Faust, *Social Network Analysis: Methods and Applications* (Cambridge: Cambridge University Press, 1994), 11-12.
[11] Barabási, Albert-László, *Network Science*, sec. 2., p. 3.
[12] Stanley Milgram, "The Small World Problem," *Psychology Today* (1967) 2: 60–67.
[13] Pádraig Mac Carron, "A Network Theoretic Approach to Comparative Mythology," 3.
[14] Barabási, Albert-László, *Network Science*, 1.4
[15] Stephen P. Borgatti, Martin G. Everett, and Jeffrey C. Johnson, *Analyzing Social Networks* (London: SAGE Publications Ltd., 2013), 1.

The underlying argument of network science is that

> the architecture of networks emerging in various domains of science, nature, and technology are similar to each other, a consequence of being governed by the same organizing principles. Consequently we can use a common set of mathematical tools to explore these systems.[16]

Underlying patterns have been extensively studied in order to create parameters for "real world" systems.[17] Besides being used to discover some sort universal system, this type of analysis is also used

> to express rationally defined theoretical concepts by providing formal definitions, measures and descriptions, to evaluate models and theories in which key concepts and propositions are expressed as relational processes or structural outcomes, or to provide statistical analyses of multirelational systems.[18]

Measures such as the degree of the network (see section 3.4.1) and the clustering coefficient (see section 3.4.4) help to describe not only the network as a whole but also the characters that make up the network. Moreover, they help us to test hypotheses concerning how these relationship structures allow for conversation. In short, network theory therefore provides a set of common definitions and measurements to describe and test these systems.

Social networks specifically refer to the "set of actors and the ties among them," and analysis of these networks can be used to study the structural variables and the relationship structures of these groups.[19] Furthermore, social network analysis focuses "on *relationships*

---

[16] Barabási, Albert-László, *Network Science*, sec. 1.3

[17] Luís A. Nunes Amaral, Antonio Scala, Marc Barthélémy, and H. Eugene Stanley, "Classes of behavior of small-world networks," *Proceedings of the National Academy of Sciences U.S.A.* 97 (2000): 111-149. Duncan J. Watts and Steven H. Strogatz, "Collective dynamics of 'small-world' networks," *Nature* 393 (June 1998): 440-442.

[18] Wasserman and Faust, 5.

[19] Wasserman and Faust, 9.

among social entities, and on the patterns and implications of these relationships."[20] It is the deliberate application of graph theory to the study of social relationships.

2.3 Benefits of Social Network Analysis

2.3.1 Use of Graph Theory & Social Network Analysis

There are a variety of different types of networks, and this is often decided by who makes up the networks and what relationships are measured.[21] As such, social network analysis has been used across a wide variety of disciplines to study an even wider variety of networks.[22] There have been network studies on

- World-Wide Web[23]
- Internet[24]
- Movie actor collaboration network
- Science collaboration graphs[25]
- Human sexual contacts[26]
- Cellular networks
- Ecological networks
- Phone-call networks

---

[20] Wasserman and Faust, 3.

[21] Carron and Kenna, "Universal Properties of Mythological Networks," 1. Jukka-Pekka Onnela, Daniel J. Fenn, Stephen Reid, Mason A. Porter, Peter J. Mucha, Mark D. Fricker, and Nick S. Jones, "Taxonomies of networks from community structure," arXiv:1006:573lv3 (May 18, 2012). L. A. Amaral, Barthélémy A. Scala, and H.E. Stanley. "Classes of small world networks." *Proceedings of the National Academy of Science USA* 97, no. 21 (Oct. 10, 2000): 11149-11152.

[22] For more examples see, Wasserman and Faust 5-6. S.N. Dorogovstev and J.F.F Mendes, "Evolution of Networks," *Physics Review E.* 65, no. 066122 (2002). Costa, Luciano da Fontoura, Osvaldo N. Oliveria Jr., Gonzalo Travieso, et al. "Analyzing and modeling real-world phenomena with complex networks: a survey of applications." *Advances in Physics* 60, no. 329 (2011): 329-412.

[23] Lawrence, S. and C. L. Giles, 1999, *Nature* 400, 107. Xeong, H., B. Tombor, R. Albert, Z. N. Oltvai and A.-L. Barabási, 2000, *Nature* 407, 651. Jéka Albert, Hawoong Jeong, and albert-László Barabási, "Internet: Diameter of the World-Wide Web," *Nature* 401 (Sept. 1999): 130-131. Lada A. Adamic and Bernardo A. Huberman, "Power-Law Distribution of the World Wide Web," *Science* 287, no. 5461 (March 2000): 2115. Andrei Broder et al., "Graph structure in the Web," *Computer Networks* 33, no. 1-6 (June 2000): 309-320.

[24] Faloutsos, Michalis, Petros Faloutsos, and Christos Faloutsos. "On power-law relationships of the internet topology." In *ACM SIGCOMM computer communication review*, vol. 29, no. 4, pp. 251-262. ACM, 1999.

[25] A. L. Barabási, H. Jeong, Z. Néda, E. Ravaz, A. Schubert, and T. Vicsek, "Evolution of the social network of scientific collaborations," *Revised Modern Physics* (2002): 47-61. Pádraig Mac Carron and Ralph Kenna, "Universal Properties of Mythological Networks," 1. Onnela et. al., "Taxonomies of networks from community structure. L. A. Amaral, Barthélémy A. Scala, and H.E. Stanley, "Classes of small world networks," *Proceedings of the National Academy of Science USA* 97, no. 21 (Oct. 10, 2000): 11149-11152.

[26] F. Liljeros et al., "The Web of Human Sexual Contacts," *Nature* 411 (2001) 907-908.

- Citation networks[27]
- Networks in linguistics
- Power and neural networks
- Protein folding
- Public Transportation[28]
- History[29]

Though the research questions and the exact methodologies may vary, "network science offers a language through which different disciplines can seamlessly interact with each other."[30] As such, social network analysis naturally allows for interdisciplinary opportunities as an intersection between mathematics and other disciplines, such as literature.

2.3.2 Why Use Social Network Analysis?

Wasserman outlines several reasons why graph theory is useful in social network analysis.

Graph theory

1) provides a vocabulary which can be used to label and denote many social structural properties
2) gives us mathematical operations and ideas with which many of these properties can be quantified and measured
3) gives us the ability to provide theorems about graphs, and hence about representations of social structures.[31]

Besides these advantages, graph theory also allows for a representation of a network as a "model of a social system."[32] This model shows a representation of the elements of a situation.

---

[27] M.E.J. Newman. "Scientific collaboration networks." *Proceedings of the National Academy of Sciences U.S.A* 98, no. 2 (January 2001): 404-409. For a key example on mathematician Paul Erdös' 15000 papers with 492 coauthors, see R. De Castro and J.W. Grossman. "Famous trails to Paul Erdös." *The Mathematical Intelligencer* 22, no. 2 (1999): 173-186. V. Batagelj and A. Mrvar. "Some Analyes of Erdös collaboration network." *Social Networks* 22, no. 2 (2000): 173-186.

[28] C. von Ferber, T. Holovatch, Yu. Holovatch, and V. Palchykov, "Public transport networks: empirical analysis and modeling," arXiv:0803.3514v1 (March 25 2008). Christian von Ferber, Taras Holovatch, and Yurij Holovatch, "Attack Vulnerability of Public Trasnport Networks," arXiv:0709.3206v1 (September 20, 2007). Christian von Ferber, Taras Holovatch, and Yurij Holovatch, and Vasyl Palchykov, "Modeling Metropolis Public Transport," arXiv:0709.3203v1 (September 20, 2007)

[29] J.F. Padgett and C.K. Ansell," Robust Action and the Rise of the Medici, 1400-1434" *American Journal of Sociology* 98, no. 6 (1993): 1259-1319.

[30] Barbasi, Section 1.4.

[31] Wasserman and Faust, 93.

Moreover, combining the approaches of a computer scientist and a literary scholar, i.e., quantitative and qualitative analyses, allow for the benefits of both to be used in the study of literature.[33]

While the quantitative analysis is certainly helpful, humanist academics have also praised the visual representations that result from the application of graph theory. Franco Moretti praises social network analysis for allowing the past to become as visible as the present by considering the relationships in their entirety.[34] He goes so far as to remark that while he did not necessarily need network theory, he probably needed networks and the accompanying visualizations. These visualizations allowed him to see "at a glance in a two-dimensional space" characters and their interactions."[35] Similarly, Jeff Rydberg-Cox praises social network diagrams for their ability to represent characters and relationships in Greek tragedies.[36] Opponents of the application of this type of methodology to literature have argued that the quantification of literature actually does little to aid our understanding of texts.[37]

---

[32] Wassmeran and Faust, 93.
[33] Sebastian Gil, Laney Kuenzel, and Caroline Suen, "Extraction and Analysis of Character Interaction Networks from Plays and Movies," Technical Report, Stanford University, 1. Jeff Ryberg-Cox, "Social Networks and the Language of Greek Tragedy," *Journal of the Chicago Colloquium on the Digital Humanities and Computer Science* 1, no. 3 (2011): 1. Prashant Arun Jayannavar, Apporv Agarwal, Melody Ju, and Owen Rambow, "Validating Literary Theories Using Automatic Social Network Extraction," *Proceeds of NAACL-HLT Fourth Workshop on Computational Linguistics for Literature*. Denver, Colorado, June 4, 2015: 32.
[34] Moretti, Franco. "Network Theory, Plot Analysis." *New Left Review* no. 68 (2011): 4. This stands more true for static networks (see section X).
[35] Moretti, 11.
[36] Ryberg-Cox, 1.
[37] Maria Konnikova, "Humanities Aren't a Science. Stop Treating Them Like One," *The Creativity* Post, last modified January 9, 2013, http://www.creativitypost.com/arts/humanities_arent_a_science._stop_treating_them_like_one. Richard Carrier, "Bad Science Proves Demigods Exist!," *Richard Carrier Blogs*, last modified July 27, 2012, http://www.richardcarrier.info/archives/2008.

2.4 Social Network Analysis & Literature

Though the number of studies involving social network analysis and literature has gradually increased, the application of these techniques and metrics have been limited. Kydros suggests that the reasons that these techniques have not been extensively utilized is in part because of the barrier that still prevails between different disciplines. The other difficulty arises because only texts with a large sample size of characters works best for "readable and credible results."[38] This qualification therefore limits the number of texts available for study.

The earliest piece of scholarship that implements these techniques to study literature is R. Alberich, J. Miro-Julia, and F. Rosselló's 2002 examination of the Marvel Universe. Their paper considers the relationships between different characters that have appeared in the decades-old comic book publishing company, Marvel Comics.[39] They study collaboration networks because of how meaningful these relationships are. The relationships in these networks are not only quantitative, but they are also meaningful in that characters, who work together, often genuinely know one another. Their study was a departure from previous network analysis in that it studied fictitious networks rather than those in the real world.

Moved by the work of Alberich et al., David K. Elson, Nicholas Dames, and Kathleen R. McKeown worked to automatically extract social networks from 60 nineteenth-century novels and serials from 31 different authors. These networks are based on dialogue interactions.[40]

---

[38] Kydros, 116.

[39] R. Alberich, J. Miro-Julia, and F. Rosselló, "Marvel Universe looks almost like a real social network," preprint. http://arxiv.org/pdf/cond-mat/0202174.pdf.

[40] Elson, David K. and Kathleen R. McKeown, "Automatic Attribution of Quoted Speech in Literary Narrative," in *Proceedings of the Twenty-Fourth Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence.* Atlanta, Georgia, 2010, 138. It should be noted that the authors define dialogue as when "(1) The characters are in the same place at the same time; (2) The characters take turns speaking; and (3) The

Looking at various properties of the various networks, they test the correlation of properties based on dialogue with general aspects such as setting and the number of characters. Moreover, they use these networks to test the prevailing literary theories concerning this possible literary relationship.

Five years later, Prashant Arun Jayannavar, Apoorv Agarwal, Melody Ju, and Owen Rambow revisited the work of Elson et al. They present a nuanced interpretation of their results by reconsidering the literary theories underlying their hypotheses. They base their study not on dialogue but rather on *observations* – "unidirectional social events in which *only one* entity is cognitively aware of the other – and *interactions* – "bidirectional social events in which *both* entities are cognitively aware of each other *and* of their mutual awareness."[41] Focusing more on the literary theory, they argue against the initial conclusions of Elson et al. Their paper demonstrated the need for strong perspectives from both sides of an interdisciplinary study.

Working on an even larger scale, Sebastian Gil, Laney Kuenzel, and Caroline Suen built networks from 580 movie scripts and 173 plays from *The Internet Movie Script Database* and *Project Gutenberg*. For these wide-sweeping projects, computational methods are relied upon as humans are limited by their ability to simultaneously analyze and compare hundreds or thousands of works.[42]

While Alberich et al. as well as Elson et al. have worked on large amounts of texts, others have worked to analyze individual texts or smaller groups of texts. M.E.J. Newman and

---

characters are mutually aware of each other and each character's speech is mutually intended for the other to hear. Elson 141.

[41] Jayannavar et al. 36.

[42] Gil, 2. For more on computational analysis, see: Geyong-Mi Park, Sung-Hwan Kim, Hye-Reon Hwang, and Hwan-Gue Cho, "Complex System Analysis of Social Networks Extracted from Literary Fictions," *International Journal of Machine Learning and Computing* 3 no. 1 (Feb. 2013): 107-111. DOI: 10.7763/IJMLC.2013.V3.282.

M. Girvan briefly analyzed *Les Miserables* in their study of network structure. Franco Moretti used character interaction networks to analyze *Hamlet*, whereas James Stiller, Daniel Nettle, and Robin I. M. Dunbar and Stiller and M. Hudson focuses different Shakespearean plays and find that the networks were reflective of small-world properties. George R. R. Martin's *A Storm of Swords*, the third book in his popular *Game of Thrones* series, has been analyzed in this text to provide insight in the relationships in the novel and the impact they may have on the future.[43] Apoorv Agarwal, Augusto Corvalan, Jacob Jensen, and Owen Rambow, focusing on *Alice in Wonderland*, were interested in the use of an automatic annotation scheme in the analysis of literary texts and the derivation of social networks from the gathered data set.[44] Most notably, they introduced the concept of dynamic network analysis for literature since static networks can alter the seeming importance of characters.

Mariona Coll Ardanuy and Caroline Sporleder looked at 238 novels obtained from *Project Gutenberg* and examine both static and dynamic networks.[45] Using the derived networks and data, they consider if the character structure of a novel can be indicative of its genre and/or the style of the author.[46] Their preliminary findings found that the representation of novels through social networks carried the "author fingerprints."[47]

---

[43]

[44] Apporv Agarwal, Augusto Corvalan, Jacob Jensen, and Owen Rambow, "Social Network Analysis in *Alice in Wonderland*," in *Workshop on Computational Linguistics for Literature, Montréal, Canada, June 8, 2012*: 88.

[45] Ardanuy and Sporleder, 1 and 19.

[46] Ardanuy and Sporleder, 1.

[47] Ardanuy and Sporleder, 24.

Table 1: Summary of SNA Scholarship on Literature				
Author	**Year**	**Topic**	**Network Type**	**Hypothesis**
Alberich, Miro-Julia, & Rosselló	2002	Marvel Universe	Static Co-Occurrence	I
M.E.J. Newman and M. Girvan	2003	*Les Misérables*	Static Co-Occurrence	I
Stiller, Nettle, and Dunbar	2003	Shakespeare	Static Co-Occurrence	II
Stiller and Hudson	2005	Shakespeare	Static Co-Occurrence	II
Elson, Dames, McKeown	2010	Nineteenth-Century British Novels	Static Conversational	III
Gil, Kuenzel, and Suen	2011	Plays & Movies		III
Franco Moretti	2011	Shakespeare's *Hamlet*	Static Conversational	I
Agarwal, Corvalan, Jesen, and Rambow	2012	*Alice in Wonderland*	Static Interaction & Observation	II
Jayannavar, Agarwal, Ju, and Rambow	2015	Nineteenth-Century British Novels	Static Interaction & Observation	III
Ardanuy and Sporleder	2015	American & British Novels	Dynamic & Static Conversational	III
Beveridge and Shan	2016	*Game of Thrones*	Static Co-Occurrence	III

These articles also show that that social network analysis is a means to an end as it is used to answer different questions and test different types hypotheses (Table 1). Generally, there are three different types of questions that are pursued. The first type (I) studies the roles of characters. The second type (II) studies whether or not the networks in the literature mirror those in the real world. The third type (III) are more focused on the discovery of an "authorial fingerprint."

2.5 Social Network Analysis & its Applications for Classics

Classics have always been at the forefront of the integration of text and technology. Roberto Busa's *Corpus Thomisticum* is often credited as the first project of "humanities computing," the predecessor of the digital humanities.[48] Begun in the 1940s and published finally in 1956, he

[48] For example, see Willard McCarty, "What Is Humanities Computing? Toward a Definition of the Field," (paper presented in Liverpool, 20 February 1998; Reed College (Portland, Oregon, US) and Stanford University (Palo Alto, California, US), March 1998; and Wüzburg (Germany), July 1998), December 15, 2015.

had begun work on a comprehensive concordance of the works of St. Thomas Aquinas.[49] While many classical texts and their translations are saved in electronic storehouses such as Google Books and Project Gutenberg, libraries of classical texts have also been carefully curated. Though the discussion of the discussion of classics and computers should wait for another paper, it should not be denied that the relationship between the two disciplines has been strong from the beginning.

Network theory has been used in the study of ancient material culture and archaeology. Scholars such as Tom Brughmans have written broadly on the use of this type of analysis in archaeology.[50] Network theory has also been tentatively applied to ancient history, most

---

http://www.mccarty.org.uk/essays/McCarty,%20Humanities%20computing.pdf. Willard McCarty, "Humanities Computing" in *Encyclopedia of Library and Information Science* (New York: Marcel Dekker, 2003), 1226. Svensson, "Humanities Computing as Digital Humanities."

[49] For more on Busa's work see Robert Busa, *Index Thomisticus* (Stuggart: Frommann-Holzboog, 1974); Robert Busa, "The Annals of Humanities Computing: The Index Thomisticus," *Computers and the Humanities* 14 (1980): 83-90. Robert Busa, "Complete *Index Verborum* of Works of St Thomas," *Speculum* 25, no. 3 (1950): 424–5; Robert Busa, "Half a Century of Literary Computing: Towards a 'New' Philology. Literary and Linguistic Computing," *Historical Social Research / Historische Sozialforschung* 7, no. 1 (1992): 69–72; Robert Busa, *La terminologia tomistica dell'interiorita; saggi di metodo per un'interpretazione della metafisica della presenza* (Milano: Fratelli Bocca, 1949).

[50] T. Brughmans, "Facebooking the past: a critical social network analysis approach for archaeology." In *Thinking beyond the Tool: Archaeological Computing and the Interpretative Process*, A. Chrysanthi, M.P. Flores, and C. Papadopoulos (eds). Oxford: Archaeopress, forthcoming; see previously idem, "Connecting the Dots: Towards Archaeological Network Analysis," *Oxford Journal of Archaeology* 29/3 (2010) 277–303; idem, "Thinking through networks: a review of formal network methods in archaeology," *Journal of Archaeological Method and Theory* (20 April 2012; available online at: http://dx.doi.org/10.1007/s10816-012-9133-8). Also look at T. Evans, R. Rivers, and C. Knappett, "Physical and Relational Networks in the Aegean Bronze Age." In *European Conference of Complex Systems - ECCS '06*. 2006 (available online at: http://theory.imperial.ac.uk/~time/TSEpaper/AegeanECCS06.pdf); C. Knappett, *An archaeology of interaction: network perspectives on material culture and society*. New York: Oxford University Press, 2011; C. Broodbank, *An Island Archaeology of the Early Cyclades*. Cambridge, UK: Cambridge University Press, 2002. F. Coward, "Small Worlds, Material Culture and Ancient Near Eastern Social Networks." In *Social Brain, Distributed Mind*, Robin Dunbar, Clive Gamble, and John Gowlett (eds.), 449-479. Oxford University Press, 2010. S. Graham, *EX FIGLINIS: The network dynamics of the Tiber Valley brick industry in the hinterland of Rome*. Oxford: Archaeopress, 2006; see also idem, "The Space Between: The Geography of Social Networks in the Tiber Valley." In *Mercator Placidissimus. The Tiber Valley in Antiquity. New Research in the Upper and Middle River Valley*, Filippo Coarelli and Helen Patterson (eds.), 671-686. Rome: Edizioni Quasar, 2009; idem, "Converting 2-mode Networks to 1-mode Networks," Electric Archaeology (8 Feb 2012; available online at: http://electricarchaeologist.wordpress.com/2012/02/08/converting-2-mode-networks-to-1-mode- networks/).

predominantly by Ian Malkin.[51] The first book-length treatment of the subject was Giovanni Ruffini's *Social Networks in Byzantine Egypt*.[52] Social network analysis has also driven the studies of Diane Cline. Though she has focused on the application of the visualizations rather than the mathematics, she has used the resulting images with great success in her studies of Pericles and Alexander the Great.[53]

As far as the use of social network analysis and literature, in 1990, Michael C. Alexander and James A. Dankowski examined 280 letters of Cicero in order to better discern the communication and social structure during the Roman Republic. They specifically focused on the interactions between patricians and equites.[54] Their study first appeared in a Dutch journal dedicated to social networks, and its publication went virtually unnoticed.[55] In 2011, Jeff Rydberg-Cox analyzed the Greek tragedies available through the *Perseus Digital Library* to study the underlying relationship structures of the plays.[56]

In terms of the application of social network analysis theories and methodologies to pieces of epic literature, there has been a particular focus on the epics of Homer, which loom more vividly in the minds of popular culture than that of Vergil. As noted above, in 2012, Pádraig Mac Carron and Ralph Kenna published an article, "Universal Properties of Mythological Networks." They explore Joseph Campbell's claim that mythological narratives share the same

---

[51] I. Malkin, C. Constantakopoulou, and K. Panagopoulou (eds.), *Greek and Roman Networks in the Mediterranean*. London: Routledge, 2009; I. Malkin, *A Small Greek World: Networks in the Ancient Mediterranean*. Oxford: Oxford University Press, 2011. Josiah Ober, *Democracy and Knowledge: Innovation and Learning in Classical Athens* (Princeton: Princeton University Press, 2008).

[52] Giovanni Ruffini, *Social networks in byzantine Egypt* (Cambridge: Cambridge University Press, 2008).

[53] Diane Harris Cline, "Six Degrees of Alexander: Social Network Analysis as a Tool for Ancient History," *Ancient History Bulletin* 26 (2012): 59-69. Diane H. Cline, "Social Network Analysis and Ancient History," paper presented at annual meeting for the American Philological Association (APA), Chicago, Illinois, January 3, 2014.

[54] Michael C. Alexander and James A. Dankowski, "Analysis of an Ancient Network: Personal Communication and the Study of Social Structure in a Past Society," *Social Networks* 12, no. 4 (December 1990): 313-335.

[55] Diane Harris Cline, "Six Degrees of Alexander: Social Network Analysis as a Tool for Ancient History," 60

[56] Ryberg-Cox, 1-11.

fundamental structure, i.e., the *monomyth*, by analyzing the Anglo-Saxon epic *Beowulf,* Homer's *Iliad*, and the Irish epic *Táin Bó Cuailnge* as well as four fictional narratives – Hugo's *Les Misérables,* Shakespeare's *Richard III*, Tolkein's *Fellowship of the Ring*, and Rowling's *Harry Potter*.[57] They find that the social network in the *Iliad* had properties that were related to real social networks. The seeming veracity of their relationships seemed to support the archaeological evidence that supported the historicity of some of the events in the *Iliad.* Expansions of this study appeared from the same authors in subsequent years.[58]

Appearing soon thereafter in 2013, P.J. Miranda, M.S. Baptista, and S.E. de Souza Pinto, analyzed Homer's *Odyssey* as a static network, based on co-occurrence relationships. They discovered that the *Odyssey's* social network was "small world, highly clustered, slightly hierarchical and resilient to random attacks" and thus reflective of real world networks.[59] Similar to Carron and Kenna they found that, in social topological terms, the *Odyssey* was more reflective of reality, and they concluded that the *Odyssey* may be a mixture of myth- and historically-based societies. In 2015, Dimitrios Kydros, Panagiotis Notopoulos, and Georgios Exarchos focused only on Homer's *Iliad.* Utilizing a static network, based off of co-occurrence relationships, where "corresponding actors *interact* in some way," this paper reaches a similar conclusion to Carron and Kenna.[60]

---

[57] Mac Carron and Kenna, "Universal Properties of Mythological Networks," 1-6. Joseph Campbell, *The Hero with a Thousand Faces* (Princeton: Princeton University Press, 1949).
[58] Pádraig Mac Carron, "A Network Theoretic Approach to Comparative Mythology." Ralph Kenna and Pádraig Mac Carron, "Math Meets Myths: Network Investigations of Ancient Narratives." Ralph Kenna and Pádraig Mac Carron, "A Networks Approach to Mythological Epics.
[59] Miranda, Baptista, and de Souza Pinto, "Analysis of communities in a mythological social network."
[60] Kydros, Notopoulos, and Exarchos, "Homer's Iliad – A Social Network Analytic Approach," 118.

Table 2: Summary of SNA Scholarship on Classical Literature				
Author	**Year**	**Topic**	**Network Type**	**Hypothesis**
Alexander and Dankowski	1990	Letters of Cicero	Static Co-Occurrence	III
Rydberg-Cox	2011	Ancient Greek Tragedy	Static Co-Occurrence	II
Carron and Kenna	2012	*Iliad* etc.	Static Co-Occurrence	I
Miranda, Baptistsa, and de Souza Pinta	2015	*Odyssey*	Static Co-Occurrence	I
Carron	2014	*Iliad* etc.	Static Co-Occurrence	I
Kydros	2015	*Iliad*	Static Co-Occurrence	I
Kenna and Carron	2016	*Iliad* etc.	Static Co-occurrence	I
Kenna and Carron	2017	*Iliad* etc.	Static Co-Occurrence	I

Following in the tradition of scholarship that focuses on the application of social network analysis to literature, the types of hypotheses asked and answered differ from one another (Table 2). Using the same notation from section 2.4, there is a distinct preference for an examination of whether or not classical epics are able to copy real-world models.[61] There is less of an examination of character roles and relationships. Overall, however, the application of this methodology to classical literature and, more generally, the classical world is limited in scope, far more so than in literature in general. This limitation may be because of the mathematical foundations of social network analysis well as the difficulties involved with analyzing Latin and Greek texts in their original languages, though all studies so far have relied on English translations.

[61] Hypothesis Type I ... Type II... Type III.

3 Method

3.1 Introduction

In this section of the paper, there is discussion of key terms that serve as the basis for the discussion of networks, in particular, what constitutes a "node" and a "link" (section 3.2). There is then a focus on how the networks were constructed for this study and a detailed description of the networks that were created (section 3.3). Lastly, social network analysis metrics that describe the general properties of these networks are provided in greater detail (3.4).

3.2 Terminology

In mathematical terms, a *graph, G,* consists of an ordered pair $G = (V, E)$ with a set of vertices V and a set of edges E.[62] As noted by Kydros and MacCarron, in recent scholarship, the two terms, graph and network, have become almost indistinguishable in nature (see Table 3).[63] A *network,* which is more often referred to as a *graph* in mathematical literature, possesses a certain

- *number of nodes*, indicated by N, which represents the number of components in the system, as well as a certain number of [64]
- *number of links*, indicated by L, which represents the total number of interactions between these nodes.[65]

[62] Mac Carron, "A Network Theoretic Approach to Comparative Mythology," 5. Jayannavar et al. 37. Kydros, Notopoulos, and Exarchos, 118. Agarwal, Corvalan, Jensen, and Rambow, 91. Wasserman and Faust, 71 and 95.
[63] Kydros, Notopoulos, and Exarchos, 118. MacCarron, "A Network Theorietc Approach to Comparative Mythology," 5.
[64] Barabási, 2.2.
[65] Barabási 5. M. E. J. Newman. *Networks: An Introduction* (Oxford: Oxford University Press, 2010), 109. Wasserman and Faust, 95.

Table 3: Terminology[66]			
Graph Theory	**Network Science**	**Physics**	**Sociology**
Graph	Network		
Vertex	Node	Sites	Actors
Edge	Link	Bonds	Ties

In terms of types of graphs, a *simple network* or *simple graph* has only a single link between a pair of nodes (see figure 1). A *multigraph* contains *multiedges*, which contain more than one link between a pair of nodes.[67] For the purpose of this paper, if multiple links existed between a pair of nodes, they have been condensed down to one and *self-edges* or *self-loops* were created. In these self-loops, nodes are connected to themselves, are present.[68] Nodes are representative of the characters in the *Aeneid* as well as collective groups that act as one. Links are representative of the different relationships, though the issues of what constitutes a node and a link is discussed in greater detail in **section 3.2**.

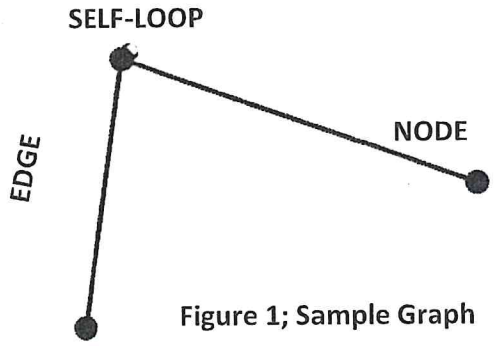


Figure 1; Sample Graph

[66] Barabási 6. Newman, 109.
[67] Newman, 110.
[68] Newman, 110. Examples of these self-loops represent soliloquies for the conversational network.

When considering simple networks, there is a further breakdown of types:

(1) When links connect individuals that regularly interact with one another at work, *organizational* or *professional networks* are derived
(2) When links connect friends to each other, *friendship networks* are derived
(3) When links connect individuals that have an intimate relationship, *sexual networks* are derived.
(4) When links connect individuals that email or call one another, *acquaintance networks* are derived.

The type of networks helps to determine the types of questions that may be asked of the data as well as the type of questions that can be answered.

(1) For professional networks, it is possible to use the present networks to discern the success – or failures – in the structure of the organization.
(2) For friendship networks, it is possible to see how ideas, products, and habits can be spread.
(3) For sexual networks, it is possible to study the spread of sexually transmitted diseases
(4) For acquaintance networks, it is possible to capture a mix of professional, friendship, or intimate links in the context of communication and marketing.[69]

For this study, the networks derived from the *Aeneid* are most similar to friendship networks.[70]

In many networks, the question of whether or not a link between two nodes is simply a "yes" or "no" question. A connection exists or there does not. When this situation arises, the network is said to be *unweighted*. Alternatively, networks can be *weighted*, in which the links have a strength, weight, or value to them.[71] The weight of the network may interact with the directionality, but these are two characters that can be included or excluded. A *directed network,* or *digraph*, is a network in which each link has a direction, pointing *from* one node *to*

---

[69] Barabási 6. Links can also be used in different types of network analysis. For example, they can be used in the "evaluation of one person by another," "transfers of material resources," "association or affiliation," "behavioral interaction," "movement between places or statuses", "physical connection," "formal relations," and "biological relationships." Wassermann and Faust, 18 and 37.
[70] Compare to Elson and McKeown, "Automatic Attribution of Quoted Speech in Literary Narrative."
[71] Newman, 112. Ardanuy and Sporleder, 13. In graph theory, these figures are known as *valued graphs* or *valued directed graphs* Wasserman and Faust, 140-141.

another. These links are referred to as *directed links*.[72] In figures, the direction is indicated by arrows.[73]

To represent the network mathematically, an *adjacency matrix,* otherwise known as a *sociomatrix*, can be created. The adjacency matrix A of a simple graph with elements A_{ij}. Note that, when network is undirected, this matrix is symmetric, i.e., if there is an edge between *i* and *j*, then there is an edge between *j* and *i*.[74] When a network is weighted, the elements in the adjacency matrix values equal the weights of the corresponding connections (see appendix I).[75]

3.3 Construction of Networks

The analysis of each book of the *Aeneid* was executed through the close analysis of the printed Latin text. Conversations and appearances of characters were not generated by computer, rather they were done by hand through a close reading of the text and all references and word counts have been generated by hand.[76] These by-hand annotations allow for a more certainty in terms of the importance of the relationships discovered. Graphs were generated through the open-source program, Gephi.[77] Stanley Lombardo's translation of the *Aeneid* and the Packard Humanities Institute text were used as points of reference. Word counts were derived from the text in the original language as presented in the Loeb Classical Library edition of the *Aeneid*.[78]

---

[72] Newman, 112-114. Wasserman and Faust, 121-122.
[73] Newman, 112-114.
[74] Newman, 111. Kydros, 120. Wasserman and Faust, 150-152.
[75] Newman, 110-113. Barabási, 11-12; 15.
[76] For the purpose of this analysis, the edition of the Latin text and its corresponding English translation was that of the *Loeb Classical Library*. Additionally, Stanley Lombardo's translation of the text was also closely examined. Other authors such as Agarwal and others, who executed studies of single texts or small groups of text, have also annotated texts by hand.
[77]
[78]

As noted by Kydros, two critical questions when constructing networks: (116)[79]

a) How is a character defined?
   The answer yields the set of nodes in the network.
b) How is the relationship between characters defined?
   The answer yields the set of links in the network.

With these two questions in mind, when examining Vergil's *Aeneid* a *conversational network* in which two character nodes are connected by an edge when there is explicit dialogue between the two was created.[80]

Each network comprises of nodes, which normally denote individual social entities and here represent the characters of the *Aeneid*.[81] Social entities may be individual, corporate, or collective social units.[82] As observed by Alberich and their study of the Marvel comic universe, some difficulties may arrive in the identification of characters – and therefore the labelling of nodes – due to the fact that the same person in the Marvel Universe make take on different personalities. Therefore, every "person" is assigned a node, independently of the nickname or personality under which it appears.[83] Similar issues arise in terms of the *Aeneid* because characters often masquerade as others. For example, in Book 12 of the *Aeneid*, Juturna, the sister of Turnus, assumes the guise of Metiscus in order to defend of her brother. In these situations, the awareness of those around the disguised were taken into account by listing the conversation as by the person and not the disguised identity. The question of who constitutes a character is also surprisingly difficult for, as Kydros notes, a character can represent a group of

[79] Wasserman and Faust, 5-12.
[80] Ardanuy and Sporleder, 12. Cf. Jayannvar et al., 36.
[81] Wasserman and Faust, 17.
[82] Wasserman and Faust, 17.
[83] Alberich, Miro-Julia, and Rosselló, 4. Elson and McKeown, 142.

humans, "especially when the group acts and reacts as a whole" (117). For example, when Aeneas addresses his troops, they are listed as a collective, "The Trojans."

In the case of the conversational networks, the networks are *directed*, i.e., who is addressing whom is noted.[84] There are *weighted nodes*, which are relative to the total number of words spoken by that character, and *weighted edges*, which are related to the total number of words exchanged between the two characters.[85] Following the example of Elson, Dames, and McKeown, the length of the quote is added to the edge weight because it is hypothesized that the number of words exchanged between characters is related to the strength of their relationship.[86] This edge weight is then normalized by the length of the Aeneid, which contains some 64,000 words. Appendix I lists all of the conversations within the *Aeneid*, sorted by book and then by line number. Appendix I also provides an adjacency matrix (see section 3.2) in which the rows and columns represent nodes and an entry in row *i* and column *j* represent a tie from *i* to *j*. The values correspond to the amount of words exchanged between characters.

Elson et al. define a dialogue interaction as such when they meet three criteria:

1. The characters are in the same place at the same time;
2. The characters take turn speaking; and
3. The characters are mutually are aware of each other and each character's speech is mutually intended for the other to hear.[87]

In order to define "speech" or "dialogue," let us turn to Gilbert Highet's definition:

---

[84] Gil et al. made use of an algorithm, which "considers an interaction to have occurred between two characters whenever the characters speak nearby lines in the same scene (4). "Nearby" means when two characters exchanged lines in the same scenes within a certain number of lines between one another. In this case, it was within 10 lines.[84]

[85] In interaction networks, interactions can be directly observed or reported on and examples of such activities such as who people talk to, watch movies with, hang out with , or communicate with. 31

[86] Elson, Dames, and McKeown, 143

[87] Elson, Dames, and McKeown, 141.

> A speech is one or more sentences supposed to be the actual words of a character, framed together on one single occasion – either spoken aloud, or directly reported as being spoken, or shaped in the mind without utterance.

Highet measures speech by line numbers because incomplete lines are not statistically equivalent to whole lines and because incomplete lines are not equal to one another.[88] Highet's speech lengths can be found in **Appendix I**. For the sake of this paper, there was a focus on the word length of speeches. There are 24,381 words of dialogue in the *Aeneid*, which represents only about 40% of the text. As such, the conversational networks, because they only focus on spoken interactions, fail to capture a huge part of the interactions in the epic.[89]

There are 334 speeches in the *Aeneid,* including dialogue quoted within the context of other speeches.[90] For example, in Book 2 and 3 where Aeneas is recounting his journeys to the Carthaginian queen Dido, reported speeches are treated as entities separate from Aeneas' overarching speech. If these speeches were not counted separately, there would only be 290 speeches. Figure 2 shows the distribution of speeches across the books of the *Aeneid*, and there is "variety in the ratio of speech to action, as in every other important structural principle."[91] On average, there are about 28 speeches per book. There are 98 characters who participate in conversation either as a receiver or transmitter.[92] Figure 3 also shows the distribution of the number of speakers in each book of the *Aeneid*. These distributions provide a new kind of

---

[88] Gilbert Highet, *The Speeches in Vergil's Aeneid* (Princeton, New Jersey: Princeton University Press, 1972), 18-19.
[89] Ardanuy and Sporleder, 12.
[90] Depending on the calculations of speech, these numbers can vary. For example, Highet found that there were 333 speeches.
[91] Highet, 20.
[92] Highet reports 90 different *speaking* characters (20).

insight into each book of the *Aeneid* as "Vergil conceived each book as an artistic unit, with its own special structural line."[93]

Figure 2:
Distribution of Speeches

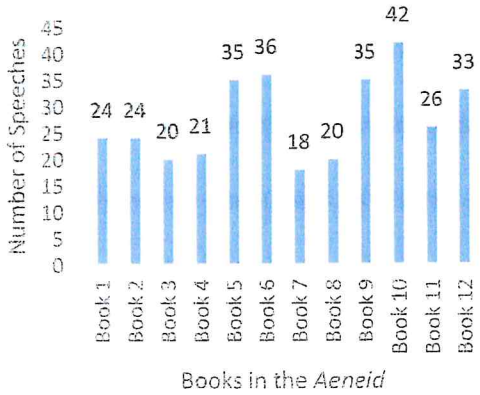
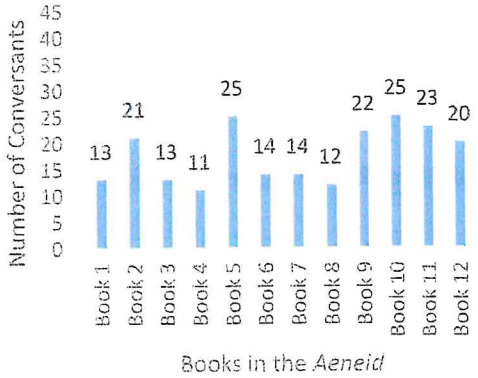


Figure 3:
Distribution of Conversants



From the conversational network, static and dynamic networks have also been derived. The *static networks* do not consider the factor of time, rather they look at the *Aeneid* in its entirety. As such they allow for insight into the relationship structures in the novel as a whole.[94] The *dynamic networks* in literature relatively recent developments, and they look at the *Aeneid* not holistically but rather in terms of its individual books.[95] By considering the temporal dimension of novels, it allows one to consider the development and the varying roles of characters.[96] For example, although Turnus only emerges as a big player in the latter half of the *Aeneid*, his role can seem to out shadow others when the *Aeneid* is considered in its entirety. On the other hand, by breaking down the *Aeneid* book by book, it becomes clearer that while Aeneas is a very active character, there are still moments when he is more inactive compared

[93] Highet, 20.
[94] Ardanuy and Sporleder, 13.
[95] Agarwal, Corvalan, Jensen, and Rambow, 90.
[96] Ardanuy and Sporleder, 13-14.

to others.[97] It is possible to build a fuller picture of the role played by a character (Argarwal 88). With the development of the dynamic and static networks, a total of two networks were constructed during the course of this paper. Subsequently, they are referred to as the **Static Conversational Network** (N_{ASC}) and the **Dynamic Conversational Network** (N_{ADC}).

3.4 Social Network Analysis Metrics

3.4.1 Degree, Average Degree, and Degree Distribution

The *degree, k,* is a key property of the node. It represents the number of links that a node has to other neighboring nodes.[98] In other terms, the degree of a node measures the "activity" of the actor.[99] The degree of the i^{th} node is denoted by k_i. For example, in the *Static Conversational Network*, the degree of a node represents the number of characters with whom that specific character converses with throughout the *Aeneid*.

In an undirected network, the *total number of links, L,* is expressed as the sum of the node degrees. It is calculated as:

$$L = \frac{1}{2}\sum_{i=1}^{N} k_i$$

While the degree is an important property of an individual node, the *average degree* is an important property of an entire network. It denotes the average number of links that a node has to other nodes.[100] In an undirected network, the *average degree* is calculated as:

$$\langle k \rangle = \frac{1}{N}\sum_{i=1}^{N} k_i = \frac{2L}{N}$$

---

[97] Agarwal, Corvalan, Jensen, and Rambow, 94.
[98] Barabási 8-10. Alberich, Miro-Julia, and Rosselló, 7. Kydros, Notopoulos, and Exarchos, 120-121.
[99] Wasserman and Faust, 100.
[100] Alberich, Miro-Julia, and Rosselló, 7. Wasserman and Faust, 100-101. Agarwal, Corvalan, Jensen, and Rambow, 91. Elson, Dames, and McKeown, 144. Kydros, Notopoulos, and Exarchos, 120-121. Beveridge, 20. Wasserman and Faust, 100-101.

To see the variability of nodal degrees, to find the variance of the degrees, S_D^2, is calculated as:

$$S_D^2 = \frac{\sum_{i=1}^{N} k_i - \langle k \rangle^2}{N}$$

A high variance suggests that the characters represented by the nodes differ in "activity," as demonstrated by the number of links to each character.[101]

In directed networks, such as the conversational networks, a node's *total degree,* k_i, is made up of the *incoming degree* or *indegree*, k_i^{in}, and the *outgoing degree* or *outdegree*, k_i^{out}. The incoming degree represents the links that point *towards* node *i* while the outgoing degree represents the links that point *away from* node *i*.[102] The in-degree is a measurement of *receptivity* or *popularity*, while the out-degree is a measurement of *expansiveness.* For example, in the conversational network, the in-degree shows how many speakers addres this certain character while the out-degree shows how many listeners this same character has. The total degree is calculated as:

$$k_i = k_i^{in} + k_i^{out}$$

Based on the values of the degree, there is a particular vocabulary for labeling these four kinds of nodes. A node is a(n):

a) *Isolate* if $k_i^{in} = k_i^{out} = 0$
b) *Transmitter* if $k_i^{in} = 0$ and $k_i^{out} > 0$
c) *Receiver* if $k_i^{in} > 0$ and $k_i^{out} = 0$
d) *Carrier* or *ordinary* if $k_i^{in} > 0$ and $k_i^{out} > 0$

The difference between a carrier and an ordinary node is that the carrier has an in-degree and out-degree precisely equal to one whereas an ordinary node has in-degree and/or out-degree

---

[101] Wasserman and Faust 101.
[102] Barabási 8-10. Newman, 133-136. Scott, 69. Agarwal, Corvalan, Jensen, and Rambow, 91. Wasserman and Faust, 125-126.

greater than one, though these values are specifically for unweighted networks.[103] In a directed network, the *total number of links, L*, is calculated as:

$$L = \frac{1}{2}\sum_{i=1}^{N} {k_i}^{in} = \frac{1}{2}\sum_{i=1}^{N} {k_i}^{out}$$

In a directed network, the *average degree* is calculated as:

$$\langle k^{in} \rangle = \frac{1}{N}\sum_{i=1}^{N} {k_i}^{in} = \langle k^{out} \rangle = \frac{1}{N}\sum_{i=1}^{N} {k_i}^{out} = \frac{L}{N}$$

These values are equal because the same set of arcs are considered but simply from different "directions."[104] In others words, for a directed network, the number of links and average degree are calculated using either the in-degree or out-degree. One may choose either measure (but not both) because the in-links and out-links make up the same set of connections in the network, but simply are viewed from different nodes' perspectives.

3.4.2 Distances, Average Path Length, Diameter[105]

It is often important to know whether it is possible for one node to be able to reach another via a link. From there, the question is the number of ways two nodes can be connected and which way may work best.[106] In a network, a *path* is a route that moves from one node to another through various links in a network.[107] The *length* of a path represents the precise number of links along that path. The *distance, d* or d_{ij}, is the shortest path between nodes *i* and

[103] Wasserman and Faust, 128.
[104] Wasserman and Faust, 127.
[105] Alberich, Miro-Julia, and Rosselló, 9.
[106] Wasserman and Faust, 105.
[107] More generally, a path may be referred to as a *walk*, which is a sequence of incident nodes and links. A *trail* is a walk in which all links are distinct while the nodes may be used more than once. A *path* is a walk in which all links and nodes are unique. Wasserman 105-107.

j, i.e., it possesses the fewest number of links.[108] The distance is also referred to simply as the *shortest path* or the *geodesic path.*[109] In undirected networks, the distance between nodes i and j and between nodes j and i are the same. In directed networks, that distance is not always the same nor does a reciprocal relationship always exist.[110]

While the shortest path is often called the distance, the maximum shortest path in the network is referred to as the *diameter* of the network, denoted by d_{max}. In other words, it is the largest distance between any pair of nodes within the network.[111] Similarly, the *eccentricity* or *association number* of the node is the largest distance from one particular node to any other node in the network. The *average eccentricity* of the network is obtained by averaging the eccentricity of all nodes in the network.[112]

The *average path length*, denoted by $\langle d \rangle$, is the average distance between all node pairs in the network.[113] This measurement is most popularly referred to as the "degrees of separation." A small value means that the information is passed along quickly between different nodes, while a large value means that it must pass through more intermediaries to spread throughout the network.[114] For a directed network, the average path length is calculated as:[115]

---

[108] Barabási 20. Newman, 139. Alberich, Miro-Julia, and Rosselló, 9. John Scott. *Social Network Analysis: A Handbook*. 2nd ed. (London: Sage Publications, 2000), 68. Kydros, Notopoulos, and Exarchos, 120.
[109] Barabási 21. Newman, 140. Kydros, Notopoulos, and Exarchos, 121. Wasserman and Faust, 110.
[110] Barabási 20.
[111] Barabási 22. Alberich, Miro-Julia, and Rosselló, 9. Kydros, Notopoulos, and Exarchos, 120. Miranda, 4-5. Wasserman and Faust, 110-111 and 134.
[112] Kydros, Notopoulos, and Exarchos, 121. Wasserman and Faust, 111.
[113] Alberich, Miro-Julia, and Rosselló, 9. Stiller and Hudson, 61. Stiller, Nettle, and Dunbar, 399. Miranda, Baptista, de Souza Pinto, 4.
[114] Stiller, Nettle, and Dunbar, "The Small World of Shakespeare's Plays," 399.
[115] Barabási 22-23.

$$\langle d \rangle = \frac{1}{N(N-1)} \sum_{\substack{i,j=1,N \\ i \neq j}} d_{i,j}$$

3.4.3 Connectedness

In an undirected network, nodes are *connected* if there is a path between nodes. They are *disconnected* if no such path exists. A network is *connected* if all pairs of nodes are connected. A network is *disconnected,* if at least one pair or connection does not exist. When such disconnects occur, *components* or *clusters,* which are subsets of nodes within a network, appear. When clusters of nodes exist in a network, they can be connected by a critical link, which is referred to as a *bridge*.[116] Such links, however, do not always exist nor do they have to. Furthermore, the removal of a bridge leaves more components than when the bridge is included.[117] A measure of the overall connected nature of the network, is the *connectance*, which measures the proportion of possible links that are realized. At the character level, *Connectance* is calculated as

$$\frac{L_i}{(N-1)}$$

where Li represents the links from a particular character, and for the entire work as

$$\frac{L}{N(N-1)}$$

The results range from 0 for a group of completely unlinked nodes to 1 for a fully connected set in which every character interacts with one another.[118]

[116] Barabási 24. Wasserman and Faust, 109-110.
[117] Wasserman and Faust, 114.
[118] Stiller and Hudson, 399).

3.4.4 Clustering Coefficient[119]

The *clustering coefficient* measures the probability that two nodes, which are linked to a third common node, have a higher probability of knowing one another through this common node.[120] Alternatively, this measurement is referred to as the *link density*.[121] For a node i with degree k, the *local clustering coefficient* for undirected networks is calculated as:

$$C_i = \frac{2L_i}{k_i(k_i - 1)}$$

where L_i represents the number of nodes in the neighborhood of node i. This coefficient measures the fraction of neighbors of node i that are linked directly to one another as $0 \leq C_i \leq 1$. C_i represents the probability that two neighbors link to one another.

- $C_i = 0$ if none of the neighbors of node i link to each other
- $C_i = 1$ if the neighbors of node i all link to one another to form a complete graph

If all links are present, the graph is said to be *complete*.[122] Characters with a high clustering coefficient tend to stay with the same group of people and will seem to have strong links with a select few.[123]

3.4.5 Giant Component

Nodes are connected when there is at least one path that connects them. Nodes can also be connected through intermediate collaborators or partners. The *giant component* represents the

---

[119] Alberich, Miro-Julia, and Rosselló, 9-10

[120] Alberich, Miro-Julia, and Rosselló, 9-10. Carron and McKenna 28002.1. Gil, Kuenzel, and Suen, 4. Kydros, Notopoulos, and Exarchos, 121. Stiller and Hudson, 61. Stiller, Nettle, and Dunbar, 399-400. Carron and Kenna, "Universal Properties of Mythological Networks," 1.

[121] Stiller, Nettle, and Dunbar, 399. Wasserman and Faust, 101-103. Elson, Dames, and McKeown, 144. Kydros, Notopoulos, and Exarchos, 120. Stiller, James and Matthew Hudson, 61. Wasserman and Faust, 101-102 and 129.

[122] Wasserman and Faust, 102.

[123] Stiller and Hudson, 70.

largest subset of nodes that are connected.[124] The *center* of the giant component is the node that minimizes this distance through its connections.[125]

4 Network Properties

4.1 Introduction

Extracting social networks from novels allows the novel to be transformed into a "schematic representation of its core structure, taken from the interactions of its characters."[126] In other words, a character-system arises from character-spaces.[127] In this section, using the network metrics established in section 3.4, the static and dynamic conversational and co-occurrence networks are explored. General properties of the networks are established.

4.2 Conversational Networks: Static & Dynamic

The most readily apparent property of a network is the number of nodes, N, and the number of links, L, and this helps to demonstrate the overall size of the network. In total, there are 132

TABLE 1: NODES & LINKS

STATIC NETWORKS											
Number of Nodes								**Number of Links**			
132								226			
DYNAMIC NETWORKS											
Number of Nodes											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
13	20	14	11	25	14	14	12	44	25	23	20
Number of Links											
18	20	15	13	30	21	17	14	28	34	25	26

participants, whether speakers or listeners, or in the language of network theory, whether they are isolates, transmitters, receivers, or carriers/ordinary (see section 3.4.1). Contrast that with

[124] Alberich, Miro-Julia, and Rosselló, 8. Carron and Kenna, "Universal Properties of Mythological Networks," 2.
[125] Alberich, Miro-Julia, and Rosselló,9. Moretti, 4.
[126] Ardanuy and Sporleder, 14.
[127] Moretti, 3.

the numbers in the dynamic network. Understandably in the individual books of the *Aeneid*, the number of participants is significantly smaller – as is the number of speeches – per individual book. Furthermore, compared to the total number of characters in the *Aeneid*, more than 700 characters, the conversational network is significantly more limited in its scope, though it is more precise in terms of how relationships are identified.[128] Also, remember that the links represent not the total number of speeches in this unit of the *Aeneid* but rather the number of unique pairings of speakers/listeners. While Aeneas and Venus speak to one another on multiple occasions in Book 1, this relationship has been condensed to one link. This condensing has occurred because it is easier to deal with two-dimensional matrices rather than the three-dimensional matrices that would be needed for networks with multiedges. This explains why, though there are some 334 speeches in the *Aeneid*, the number of links is only 226.

The *average degree* represents the average number of characters with whom a person as spoken with or interacted with.[129] Remember that the conversational network is directed, i.e., that who speaks to whom and who is spoken to is taken into account. With this in mind, the average degree maintains those patterns of speech. In the entire *Aeneid*, a character interacts on average with almost two characters.

---

[128] In comparison, Knuth reports that there are 561 nodes in Homer's *Iliad*. MacCarron and Kenna calculate 716. Kydros, Notopoulos, and Exarchos, 117. D. Knuth, *The Stanford GraphBase, A Platform for Combinationatorial Optimiaaiton (ACM Press, Addison-Wesley, 1993),* 12-14, 45-46.

[129] Alberich, Miro-Julia, and Rosselló, 7. Wasserman and Faust, 100-101. Apporv Agarwal, Augusto Corvalan, Jacob Jensen, and Rambow, 91. Elson, Dames, and McKeown, "Extracting Social Networks," 144. Kydros, Notopoulos, and Exarchos, 120-121. Beveridge, 20. Wasserman and Faust, 100-101.

TABLE 2: AVERAGE DEGREE

STATIC NETWORKS											
1.70											
DYNAMIC NETWORKS											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1.39	1	1.15	1.18	1.2	1.5	1.21	1.17	1.23	1.36	1.09	1.3

The *average weighted degree* reflects how much dialogue, on average, is exchanged between two people, in contrast to the *average unweighted degree* which shows only how many people to whom a character may be connected and does not give weight to the relationships. The weight of the nodes was also normalized to show the percentage of words spoken by the character in that specific book of the *Aeneid*. This calculation allows for a comparison between books and between character pairings (see Appendix I).

The underlying theory behind the weighting of the degree is that characters that speak with one another are more likely to have a stronger, and arguably a more meaningful, relationship. For example in Book 5 of the *Aeneid*, characters, on average, exchange only 60 words with another. This is similar to only about thirty seconds of conversation. When Aeneas hosts various funeral games in honor his father, Anchises, this book is heavier on action rather than dialogue. With the boat races, foot races, boxing contest, archery contest, and exhibition of horsemanship, Vergil allocates far more words to describing the scene and the actions of his characters rather than to the exchange of dialogue between the Trojans.

TABLE 3: AVERAGE WEIGHTED DEGREE

STATIC NETWORKS											
184.752											
DYNAMIC NETWORKS											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
178.92	84.45	139	197.36	62.2	226.79	95.07	184.42	79.18	74.44	119.04	93.52

TABLE 3: AVERAGE WEIGHTED DEGREE (Normalized)

STATIC NETWORKS											
184.752											
DYNAMIC NETWORKS											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7.692	5	7.692	9.09	4	7.14	7.14	8.33	4.55	4.00	4.35	5.00

The *connectance* (or *link density*) measures the proportion of possible links between characters.[130] This measurement considers not only what relationships exist but also what relationships could possibly exist. For example, in Book 9, there are an unusual number of speakers, 44 characters to be precise, and 28 unique pairings (table **X**). Yet despite this large number of characters, only 6% of the relationships possible are realized. Simply, this number suggests that more dialogue had the potential to happen – and may have happened without the record of Vergil – and this is true throughout the Static and Dynamic Conversational Networks.

TABLE 4: CONNECTANCE

STATIC NETWORKS											
.013											
DYNAMIC NETWORKS											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
.12	.05	.10	.12	.05	.12	.09	.11	.06	.06	.05	.07

[130] Stiller, Daniel Nettle, and Dunbar, 399. Wasserman, 101-103. Elson, Dames, and McKeown, "Extracting Social Networks," 144. Kydros, Notopoulos, and Exarchos, 120. Stiller and Hudson, 61. Wasserman and Faust, 101-102 and 129.

Similar to the connectance, the *giant component* is the largest subset of nodes with their corresponding links and thus shows how connected a set number of characters are.[131] The center of the giant component is Aeneas as he minimizes the sum of the distances from himself to all other nodes in this connected grouping. This central character has been considered the protagonist of the story.

TABLE 5: GIANT COMPONENT

STATIC NETWORKS												
	Number of Nodes							Percentage				
	118							89.39				
DYNAMIC NETWORKS												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
						Nodes						
#	11	11	-	9	14	-	-	8	-	23	21	18
%	84.62	55	-	81.82	56	-	-	66.67	-	92	91.3	90
						Links						
#	17	14	-	11	21	-	-	12	-	33	24	25
%	94.44	70	-	84.62	70	-	-	85.71	-	97.06	96	96.15

The *average path length* is the average distance between all node pairs in the network.[132] This measure is referred more popularly to as "degrees of separation" as it shows how quickly information could be passed around.[133] Understandably, in the Static Conversational Network, the average path length is the largest as there are significantly more characters. Overall, the amount of separation between characters is limited. Related to this measure, the *diameter*, the greatest distance between two connected nodes, can be calculated.[134] Like the average path length, the diameter shows that the networks are small.

---

[131] Alberich, Miro-Julia, and Rosselló, 8. Carron and Kenna, "Universal Properties of Mythological Networks," 2.
[132] Alberich, 9. Stiller and Hudson, 61. Stiller, Nettle, and Dunbar, 399. Miranda, Baptista, de Souza Pinto, 4.
[133] Stiller, Nettle, and Dunbar, 399.
[134] Alberich, Miro-Julia, and Rosselló, 9. Kydros, Notopoulos, and Exarchos, 120. Miranda, Baptista, de Souza Pinto, 4-5.Wassmerman and Faust, 110-111 and 134.

This conclusion makes sense because of the limited nature of the conversational network, which only considers characters who exchange explicit dialogue.

TABLE 7: AVERAGE PATH LENGTH

STATIC NETWORKS											
3.28											
DYNAMIC NETWORKS											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2.59	1.77	1.88	2.24	2.11	2.12	1.82	1.78	2.05	1.84	2.89	2.28

TABLE 6: DIAMETER

STATIC NETWORKS											
8											
DYNAMIC NETWORKS											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
6	3	4	5	5	4	3	4	5	3	8	5

The *clustering coefficient* measures helps to determine how likely characters are to group together and converse with one another. The average clustering coefficient is a value between 0 and 1, with 0 representing a more fractured group and 1 resembling more of a clique. While the networks constructed from the *Aeneid* tend to be smaller in size, they are also more fractured in nature.

TABLE 8: AVERAGE CLUSTERING COEFFICIENT

STATIC NETWORKS											
.10											
DYNAMIC NETWORKS											
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
.03	.01	0	.03	.09	.09	.06	.12	.02	.10	.02	.01

5 "Real World" Relationships

5.1 Introduction

While with written text, readers have the ability to easily reference points at the beginning and end, they still arguably face the same difficulties as play-goers in terms of keeping track of

characters.[135] An author's ability to simulate real world relationship structures therefore can lend to the reader's ability to follow a story's plot and to thus understand the storyline. Real world networks are first seen...[136] In the case of these networks, several defining features come to the forefront. In order to be considered as having "real world" properties, networks must be

- Small World[137]
- Hierarchical Structure[138]
- Assortatively Mixed by Degree
- Scale Free
- Vulnerable to Targeted Attack
- Robust to Random Attack

In this section of the paper, first metrics important to the evaluation of these real world characteristics are discussed, including an introduction to random networks. Then, these calculations are applied to the conversational and co-occurrence networks, and the networks are evaluated on their own in terms of their ability to imitate these characteristics.

5.2 Metrics

5.2.1 Random Networks

While real world networks have been studied to discern the properties that naturally occur in relationships, such networks can be reproduced through the creation of random networks.

---

[135] Stiller, Nettle, and Dunbar, 397-399.

[136] Carron and Kenna, "Universal Properties of Mythological Networks,"3.

[137] D.J. Watts. *Small* Worlds. Princeton: Princeton University Press (1999). D.J. Watts and S.H. Strogatz. "Collective dynamics of 'small-world' networks." *Nature* 393 (1998): 440-442. Luís A. Nunes Amaral, Antonio Scala, Marc Barthélémy, and H. Eugene Stanley, "Classes of behavior of small-world networks," *Proceedings of the National Academy of Sciences U.S.A.* 97 (2000): 111-149. H.R. Bernard, P.D. Killworth, M.J. Evans, C. McCarty, and G.A. Shelly. "Studying Social Relations Cross-Culturally." *Ethnology* 27 (1988): 155-179. F.R. Christopher Liljeros, C.R. Edling, L.A. Nunes Amaral, H. Eugen Stanley, and Y. Aberg, "The Web of Human Sexual Contacts," *Nature* 411 (2001): 907-908. M.E.J. Newman, "The Structure of Scientific Collaboration Networks." *Proceedings of the National Academy of the Sciences of the USA* 98 (2001): 404-409. S.H. Strogatz, "Exploring Complex Networks," *Nature* 401 (2001): 268-276.

[138] Carron and Kenna, "Universal Properties of Mythological Networks," 1. Erzsébet Ravasz and Albert-László Barabási, "Hierarchical organization in complex networks," *Physics Review E* 67, no. 026112 (2003): -1-7. Albert-László Barabási and Réka Albert, "Emergence of Scaling in Random Networks," *Science* 286, no. 509512 (1999): 1-11. arXiv:cond-mat/9910332v1 (Oct. 21, 1999)

These networks also can be juxtaposed against the existing networks and can help to discern if the networks do in fact portray real world properties. These properties will be discussed soon thereafter.[139]

A *random network* consists of *N* nodes with the links pairing sets of nodes generated randomly with probability *p*.[140] In a random network, the expected number of links takes into account the probability *p* that two nodes are connected as well as the number of pairs that we aim to generate as $L_{max} = \frac{N(N-1)}{2}$. We can denote the average number of links as

$$\langle L \rangle = \sum_{L=0}^{\frac{N(N-1)}{2}} Lp_L = p\frac{N(N-1)}{2}$$

Based off of this calculation, the average degree of a random network is the product of the probability *p* that two nodes are connected and L_{max}, the maximum number of links in a network with *N* nodes[141]

$$\langle k \rangle = \frac{2\langle L \rangle}{N} = p(N-1)$$

The degree distribution in a random network[142]

$$p_k = (\frac{N-1}{k})p^k(1-p)^{N-1-k}$$

---

[139] Barabási 4.
[140] Barabási 4. Alberich, Miro-Julia, and Rosselló, 6-7.
[141] Barabási 6-7.
[142] Barabási 9. Alberich, Miro-Julia, and Rosselló, 11.

5.2.2 Small World

In order to be considered small world, two properties must be satisfied. The clustering coefficient of the network should be significantly larger than that of the random network. The average path length should also be significantly larger than that of the random network.

5.2.2a Average Path Length

The *average path length*, denoted by $\langle d \rangle$, is the average distance between all node pairs in the network.[143] For a directed network, the average path length is calculated as:[144]

$$\langle d \rangle = \frac{1}{N(N-1)} \sum_{\substack{i,j=1,N \\ i \neq j}} d_{i,j}$$

The network is said to be small world if $d = d_{rand}$.[145]

5.2.2b Clustering Coefficient

The *clustering coefficient* measures the probability that two neighbors of a node are linked (see section 3.4.4). In general, collaboration networks have large clustering coefficients.[146] This large clustering as well as a low average distance creates *small-world* networks. Moreover, if the clustering coefficient of the network is significantly greater than the clustering coefficient of the random network *and* if the average path length of the network is significantly larger than that of the random network, $C \gg C_{rand}$, the network is small world.[147] The C_{rand} is the clustering

---

[143] Alberich, Miro-Julia, and Rosselló, 9. Stiller and Hudson, 61. Stiller, Nettle, and Dunba, 399. Miranda, Baptista, de Souza Pinto, 4.

[144]

[145] Carron and Kenna, "Universal Properties of Mythological Networks," 1.

[146] Alberich, Miro-Julia, and Rosselló, 10. Barabási Complex 25.

[147] Miranda, Baptista, de Souza Pinto, 5.

coefficient of a random network of the same size, i.e., the same number of nodes, and the same average degree.[148]

$$C_i = \frac{2L_i}{k_i(k_i - 1)}$$

5.2.3 Hierarchical Structure

By calculating all the degrees form all the nodes and backfilling the percentages, we can derive p(k), the probability that a given node has the degree k.[149] In collaboration networks, the distribution P(k) has a tail that follows either a power law, $P(k) \sim k^{-t}$. For some constant, positive exponent t, or a power law with an exponential cutoff, $P(k) \sim k^{-t} * 10^{\wedge -k/c}$. In these situations, t and c are two positive constants and c is large. The power law allows for the existence of a small number of nodes with a very high degree. The cutoff prevents the existence of nodes with high degrees. The cutoff exists because of the finite amount of time allowed for interactions. Due to this limitation, it is impossible for a node to interact with a certain number of individuals within an upper bound.[150] If it follows the power law, the network is considered scale-free.[151] As seen in these graphs, assortative mixing by degree is the idea that vertices of high degree associate with other highly connected vertices, while vertices of lower degree associated with less linked.[152] To obtain the best fit of the distribution of degrees, we have logarithmically binned the data and performed a linear regression of $\log(P(r))$ on $\log(r)$.[153]

---

[148] Carron and Kenna, "Universal Properties of Mythological Networks," 1.
[149] Miranda, Baptista, de Souza Pinto, 4.
[150] Alberich, Miro-Julia, and Rosselló, 11.
[151] Miranda, Baptista, de Souza Pinto, 4.
[152] Carron and Kenna, "Universal Properties of Mythological Networks," 2.
[153] Alberich, Miro-Julia, and Rosselló, 5.

5.2.4 Giant Component

The *giant component* represents the largest subset of nodes with their corresponding links. In large collaboration networks, a very large subset of nodes are connected to one another and thus the giant component is quite large. In fact, it is around 80% to 90% of all nodes in the network.[154] Another possible calculation is that the *average degree* is consistently smaller than the theoretical average degree calculated by the random model.[155]

5.2.5 Attacks: Targeted & Random

With the betweenness centrality (section 6.2.5), it is possible to remove the most important nodes to see how the giant component behaves after the removal of these nodes. This type of removal is referred to as a *targeted attack*. If the network begins to break down quickly and the giant component greatly decreases when the top 5% of nodes with the highest betweenness centrality are removed, the network is said to be *vulnerable to targeted attack* and to lack robustness. If the network remains connected, it is said to be *robust*.[156] On the other hand, the *random attack* is when nodes are chosen at random to be removed.[157] In other words, if a few key characters are still present after a random attack, the flow of information can be perceived. It would not affect the plot nor the audience's perception.[158] A lack of robustness suggests that a network is overly reliant on a few people.[159] Moreover, vulnerability to targeted attack but

---

[154] Alberich, Miro-Julia, and Rosselló, 8. Carron and Kenna, "Universal Properties of Mythological Networks," 1.
[155] Carron and Kenna, "Universal Properties of Mythological Networks," 1. Alberich, Miro-Julia, and Rosselló, 8.
[156] Carron and Kenna, "Universal Properties of Mythological Networks," 3.
[157] Miranda, Baptista, de Souza Pinto, 6. R. Albert, H. Jeong, and A-L Barabási, "error and attack tolerance of complex networks," *Nature* 406 (2000) 378.
[158] Stiller and Hudson, di70.
[159] Pádraig Mac Carron, "A Network Theoretic Approach to Comparative Mythology," 7.

robustness to random attack hint that these networks may be scale-free, one of our essential characteristics of real-world social networks.[160]

5.3 Results & Analysis

According to the approximate path lengths and clustering coefficients of the randomly generated graphs in Gephi, the networks in the *Aeneid* appear to not be real. However, when the distribution of the degrees is taken into account, we see that they do indeed follow a power-law distribution and therefore are mixed assortatively. Moreover, the large giant component also indicates that many books of the *Aeneid* are the correct size for real world networks; however, some do not quite fit the bill such as Book 2 and Books 3 and 7 contain no giant component initially. When the giant component is subject to targeted and random attacks the networks prove that they are vulnerable to targeted attack but are robust to random attacks. Therefore, they seem to have characteristics of a real world network. Here, the presence of the dynamic networks come into use because it shows the varying ability of Vergil to truly capture real world relationships. It also shows the varied character of the books as it suggests that books heavy on exposition may provide too small a sample of speech to analyze and to reflect real world principles.

Giant Component for a Targeted Attack of N_{ADC}												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
#	13	20	14	11	25	14	14	12	44	25	23	20
%	84.62	55	-	81.82	56	-	-	66.67	-	92	91.3	90
5%	**41.6**	**15.7**	*66.6*	**50**	**20.8**	*46.1*	*69.2*	**27.2**	*76.1*	**62.5**	**54.55**	**31.5**
10%	-	16.6	-	-	22.7	-	-	-	*70*	31.8	52.3	33.33
15%	27.2	17.6	*45.4*	33.3	23.8	*16.6*	*50*	30	*73.68*	19.05	50	11.76
20%	-	18.7	-	-	15	*9.09*	*45.4*	-	*77.78*	10	27.78	12.5

[160] Carron and Kenna, "Universal Properties of Mythological Networks," 3.

25%	30	20	*50*	25	-	-	*30*	22.22	*52.94*	-	23.5	13.33

Giant Component for a Random Attack of N_{ADC}												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
#	13	20	14	11	25	14	14	12	44	25	23	20
%	84.62	55	-	81.82	56	-	-	66.67	-	92	91.3	90
5%	83.33	57.89	-	80	54.17	-	-	65.43	-	90.1	89.86	88.52
10%		55.56	-		54.45	-	-	63.22	-	88.21	85.01	87.72
15%	81.82	52.59	-	77.78	52.11	-	-	61.59	-	85.21	83.62	85.99
20%		56.25	60		49.43	-	-	58.2	-	83.99	79.12	84.32
25%	80	53.33	44.44	75	46.32	-	-	55.21	-	82.1	76.2	81.36

6 Character Roles & Relationships in the *Aeneid*

6.1 Introduction

A prevailing question in social network analysis has been the identification of the "most important" actors in a social network.[161] In the context of literature, it is not necessarily difficult to identify the main characters. Social network analysis allows for an opportunity to discern the *importance* or *prominence* of an actor means and to discuss the properties of the actor's location in the network in question. Further, social network analysis metrics allows for an opportunity to *quantify* the prominence of individuals.[162] It should be noted that there is no "right" centrality measure.[163] Rather, each measurement gives complementary information and further dimensions to the role of a character. In this section of the paper, I discuss the metrics involved with considering the role of a character in a network (section 6.2) before looking at specific characters in the *Aeneid* and their roles depending on the type of network (section 6.3).

[161] Wasserman and Faust, 169.
[162] Wasserman and Faust 14-15 and 169. For more on character holes, see R.S. Burt, *Structural Holes: The Social Structure of Competition.* Cambridge: Harvard University Pres, 1995.
[163] Beveridge, 21.

6.2 Metrics

6.2.1 Connectivity: Degree Centrality

One of the major questions is "which are the most important or most central vertices in a network?"[164] Several different measurements may be used to this end. The simplest centrality measure is the *degree* of a node, which, as mentioned in section 3.4.1, is the total number of edges connected to a node. This measurement is sometimes called the *degree centrality*.[165] Though simple, Newman (2010) argues that this measurement can be very illuminating. For at the most basic level, in a social network, it can demonstrate who has the most or least connections with the assumption being that people with many connections have "more influence, more access to information, or more prestige than those who have fewer connections."[166]

At the most basic level, especially in undirected networks, prominent actors are those that are involved with many actors. Their involvement defines them as a *central* character.[167] A character with a high centrality value is "where the action is" and thus directs the attention to the most visible actors in the network in terms of its contact with others. Due to the actor's connections, it can be perceived as a "major channel of relational information, indeed, a crucial cog in the network, occupying a central location."[168] Meanwhile, actors with a low degree can be considered "peripheral."[169]

---

[164] Newman, 168.
[165] Wasserman, 178-179.
[166] Newman, 169. Beveridge, 20. Agarwal, Corvalan, Jensen, and Rambow, 91.
[167] Wassermann and Faust, 173.
[168] Wasserman and Faust, 179.
[169] Wasserman and Faust, 180.

6.2.2 Connectivity: Eigenvector Centrality

While the degree centrality treats all links as equal, the *eigenvector centrality* acknowledges the fact that not all neighbors are equivalent by awarding nodes a score that is proportional to the sum of the scores of its neighbors. Because some neighbors are more important than others, the importance of their neighbors therefore has an impact on those linked to them.[170] In terms of its score, therefore, a node gets a boost for begin connected to important people. The eigenvector centrality is the weighted sum of the importance of its neighboring nodes and is calculated as

$$x_i = \sum_{j \in V} w_{ji} x_j$$

for each $i \in V$. Solving the resulting linaer system gives the eigenvector centrality.[171]

6.2.3 Connectivity: PageRank

Similar to the eigenvector centrality, the *pagerank* also takes into account the importance that a node gains from being connected to other important nodes. Unlike the eigenvector centrality, however, a node does not get full credit for the total importance of its neighbor. For example, the influence of a character is shared by those connected to him/her. The importance is divided amongst its direct connections. The pagerank is calculated as

$$y_i = \alpha \sum_{j \in V} \frac{w_{ji}}{k_j} y_j + \beta$$

where $\alpha + \beta = 1$ and $\alpha, \beta \geq 0$ and with $\beta = .15$[172]

---

[170] Newman, 169. Beveridge, 20

[171] Beveridge, 20.

[172] Beveridge, 21.

6.2.4 Connectivity: Closeness Centrality

Unrelated to the eigenvector centrality (and the Katz centrality and PageRank) is the *closeness centrality*, which measures the mean (average) distance from one node to others.[173] Closeness reflects the compactness of a network, and actors with a lower score are more important than others.[174] It is based on how *close* an actor is to others, and this closeness allows for one to interact quickly with others.[175]

6.2.5 Connectivity: Betweenness Centrality

The *betweenness centrality* measures how much a node lines on paths between other nodes.[176] The higher the score, the more a node is used to pass along information, and nodes with high scores can be seen as a "brokers in communication." It reflects the "facilitation of circulation" of information.[177] Interactions between two nonadjacent nodes might depend on others who lie on the paths between these two. The others potentially have control or influence over these interactions. This location *in between* many actors lends to a large "betweenness centrality."[178] It is calculated as

$$z_i = \sum_{j,k \in V} \frac{\sigma_{jk}(i)}{\sigma_{jk}}$$

where σ_{jk} is the number of (j,k) shortest paths and $\sigma_{jk}(i)$ is the number of these (j,k) shortest paths that go through vertex i.

---

[173] Newman, 171. Kydros, Notopoulos, and Exarchos, 123. Beveridge, 21. Wasserman and Faust, 183-187.
[174] Kydros, Notopoulos, and Exarchos, 123. Beveridge 21
[175] Wassermann and Faust, 183-184.
[176] Newman, 185. Kydros, Notopoulos, and Exarchos, 123. Carron and Kenna, "Universal Properties of Mythological Networks," 2. Beveridge, 21. Miranda, 5-6. Wasserman 188-191. Miranda 5. L.C. Freeman, "A set of Measurements of Centrality Based on Betweenness," *Sociometry* 40 (1997) 35.
[177] Kydros, Notopoulos, and Exarchos, 123.
[178] Wasserman and Faust, 188-189.

6.2.7 Giant Component

Two nodes in a network are *connected* when there is at least one path in the network. The *giant component* is the largest subset of nodes with corresponding links.[179] The individual at the center of the *giant component* is often seen as the protagonist.

6.3 Results & Analysis

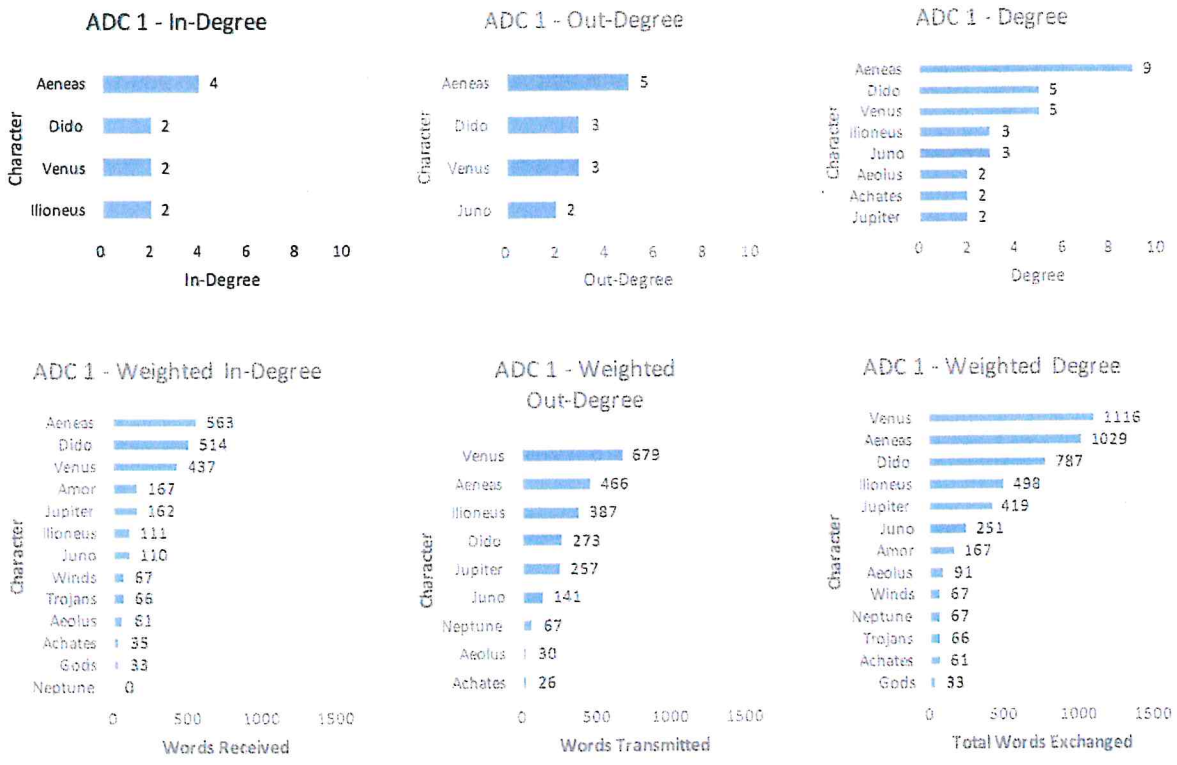
6.3.1 Conversational Network

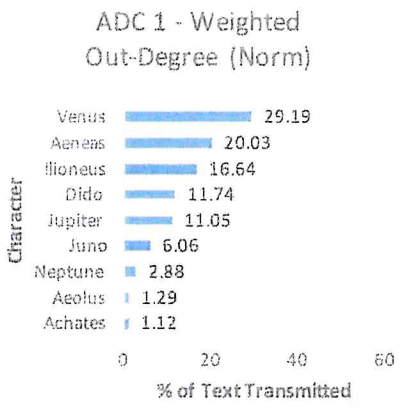
Looking at the static conversational network first provides a broad overview of the characters in the *Aeneid* (see Appendix II). When sorted by degree, it is rather unsurprising to see who rises to the top. However, when sorted by weighted degree, Ascanius disappears and is replaced by the likes of Evander. So while Ascanius may talk to many people, he still does not speak many words. While this static network provides an excellent overview of the characters in the *Aeneid*. It is still limited in that it may skew the importance of some characters over the others as, for example, Deiphobe, though she only appears in two books of the *Aeneid* and thus is not necessarily physically present throughout, maintains such a high ranking.

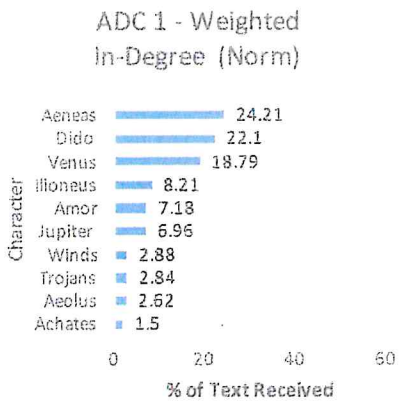
As an example, let us look at the results of the relationships in Book I of the *Aeneid*. Aeneas has the highest degree centrality as he converses with the most number of people. Moreover, as indicated by his in-degree, which shows how many people talk to him, and his out-degree, which shows how many people he himself talks to, he is both a transmitter and a receiver node. Moreover, he can be considered a carrier of information. The weighted degree shows the number of words exchanged by a character. Ilioneus, though he does not have a high degree since he only converses with two people, does have a high weighted degree with almost 500 words exchanged. Amor with his high closeness centrality, though he does not converse

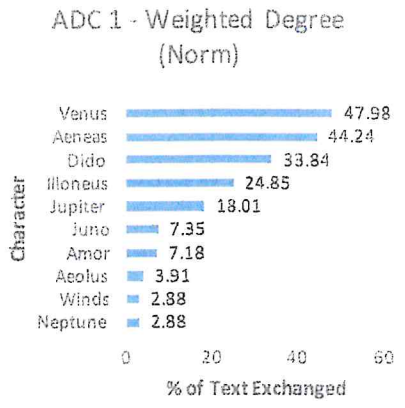
[179] Alberich, Miro-Julia, and Rosselló, 8.

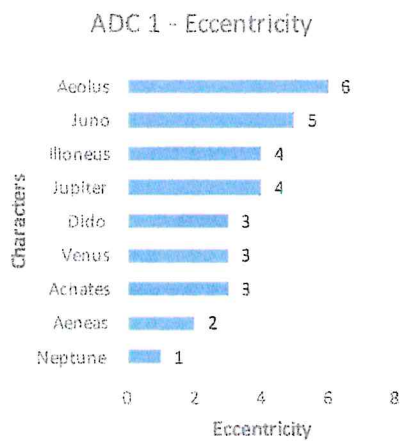
Figure 4: Top Ranking Characters in the ADC 1
(Dynamic Conversational Network in Book 1 of the *Aeneid*)

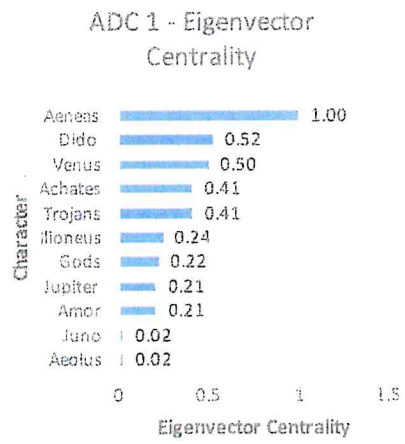


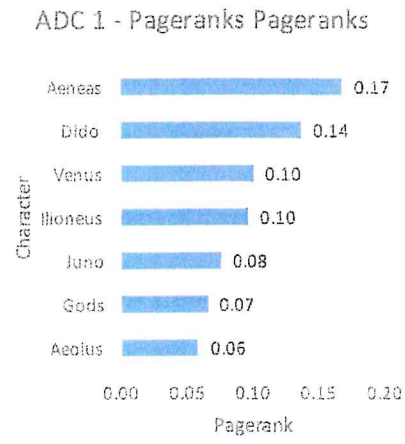

ADC 1 - Weighted Out-Degree (Norm)
Character
Venus 29.19
Aeneas 20.03
Ilioneus 16.64
Dido 11.74
Jupiter 11.05
Juno 6.06
Neptune 2.88
Aeolus 1.29
Achates 1.12
0 20 40 60
% of Text Transmitted

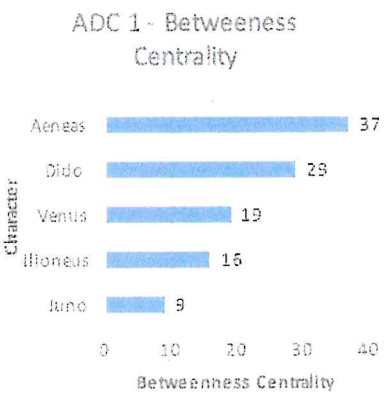

ADC 1 - Weighted In-Degree (Norm)
Character
Aeneas 24.21
Dido 22.1
Venus 18.79
Ilioneus 8.21
Amor 7.18
Jupiter 6.96
Winds 2.88
Trojans 2.84
Aeolus 2.62
Achates 1.5
0 20 40 60
% of Text Received

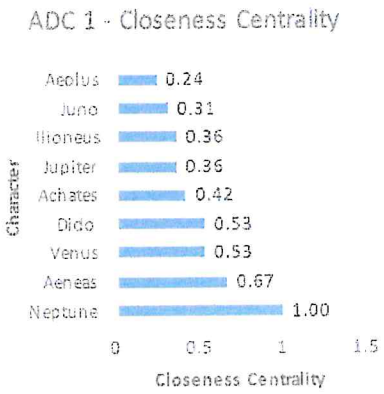

ADC 1 - Weighted Degree (Norm)
Character
Venus 47.98
Aeneas 44.24
Dido 33.84
Ilioneus 24.85
Jupiter 18.01
Juno 7.35
Amor 7.18
Aeolus 3.91
Winds 2.88
Neptune 2.88
0 20 40 60
% of Text Exchanged

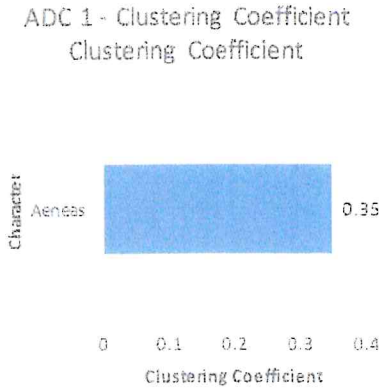

ADC 1 - Eccentricity
Characters
Aeolus 6
Juno 5
Ilioneus 4
Jupiter 4
Dido 3
Venus 3
Achates 3
Aeneas 2
Neptune 1
0 2 4 6 8
Eccentricity


ADC 1 - Eigenvector Centrality
Character
Aeneas 1.00
Dido 0.52
Venus 0.50
Achates 0.41
Trojans 0.41
Ilioneus 0.24
Gods 0.22
Jupiter 0.21
Amor 0.21
Juno 0.02
Aeolus 0.02
0 0.5 1 1.5
Eigenvector Centrality


ADC 1 - Pageranks Pageranks
Character
Aeneas 0.17
Dido 0.14
Venus 0.10
Ilioneus 0.10
Juno 0.08
Gods 0.07
Aeolus 0.06
0.00 0.05 0.10 0.15 0.20
Pagerank



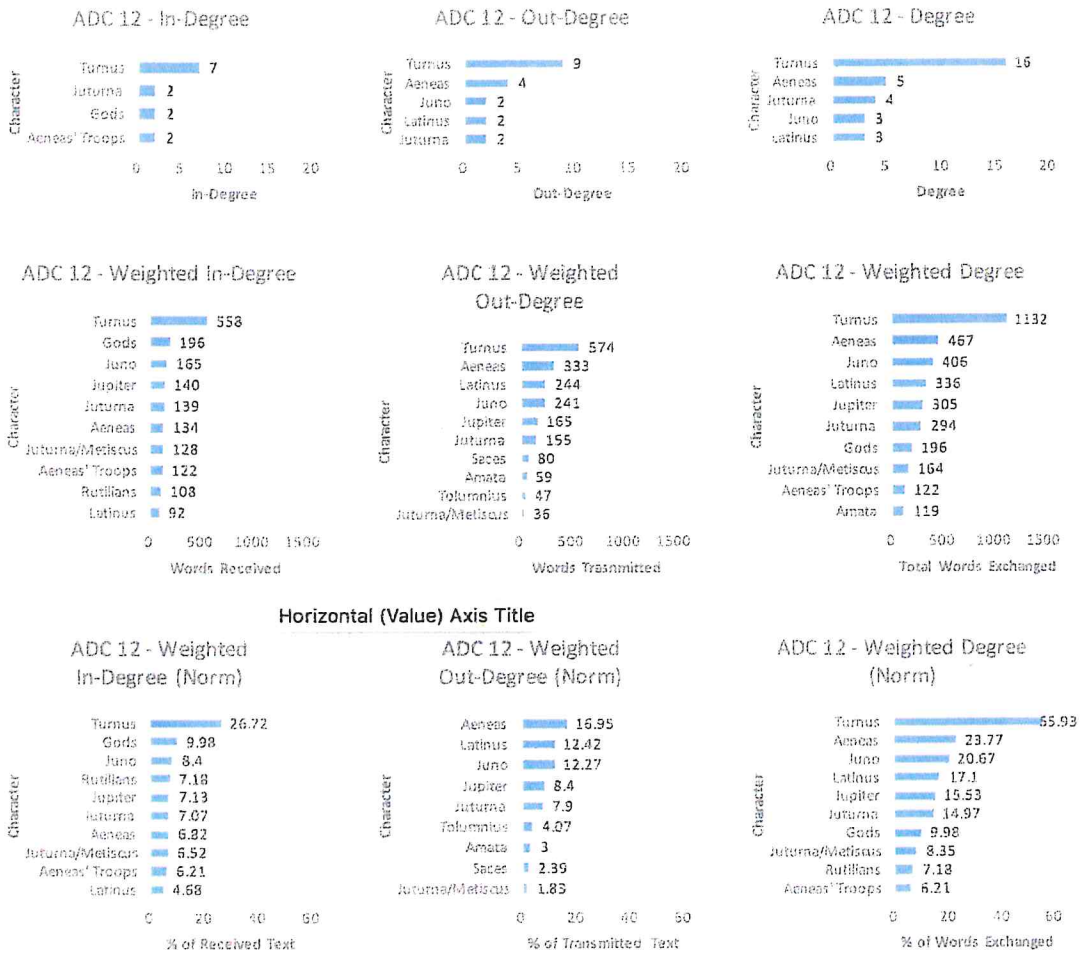


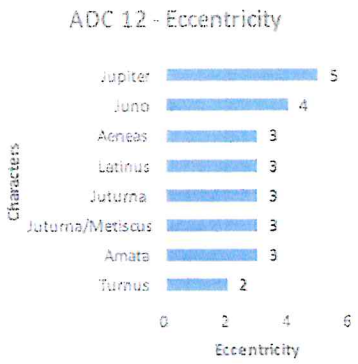


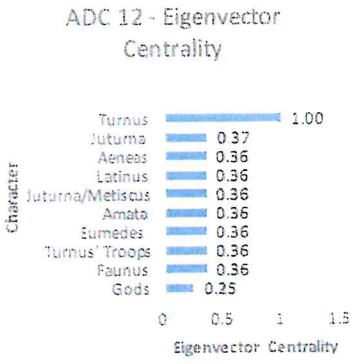
with many people as indicated by his degree of two, is shown to be important to others and his role in the transference of information. Similarly, his high betweenness centrality value further indicates that he acts as a broker of information and as a bridge for conversation. It should be noted that the clustering coefficient is often a value of zero with only Aeneas and Juno showing values above this amount. Due to the rather disconnected nature of the network, there areonly limited opportunities for cliques to arise when the patterns of conversation, i.e., who is talking and who is receiving, are maintained.

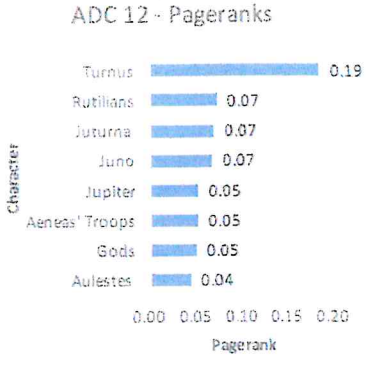
The benefits of the creation of a dynamic network are further realized when we consider the results from Book 12 of the *Aeneid* and compare them to those in Book 1. Immediately evident is the sheer number of characters present compared to Book 1 as well as the change in who is present. Because of the dynamic networks, it becomes easier to track the evolving roles and relationships of characters. For example, Turnus, a character who is not present in Book I of the *Aeneid* now has the highest degree centrality with a degree of 16, and Aeneas has become far more of a transmitter of information rather than a receiver with an in-degree of 1 and an out-degree of 4. Although Aeneas exchanges far fewer words than Turnus, in terms of his relationships to others, as indicated by the closeness centrality and his

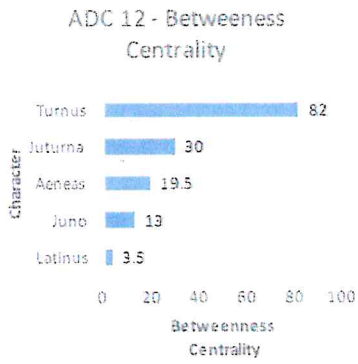
Figure 5: Top Ranking Characters in the ADC 1
(Dynamic Conversational Network in Book 1 of the *Aeneid*)

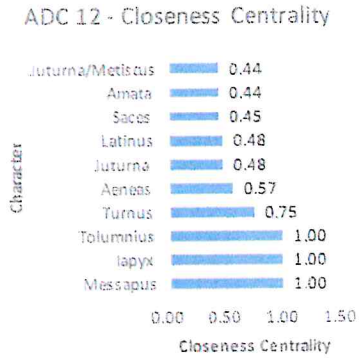


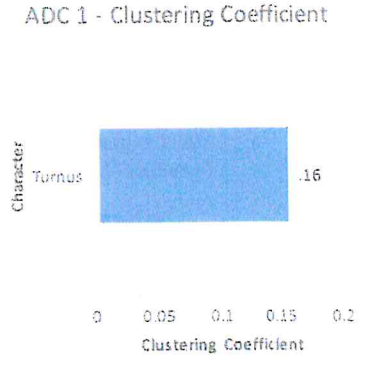

ADC 12 - Eccentricity
Jupiter 5
Juno 4
Aeneas 3
Latinus 3
Juturna 3
Juturna/Metiscus 3
Amata 3
Turnus 2
Characters
0 2 4 6
Eccentricity


ADC 12 - Eigenvector Centrality
Turnus 1.00
Juturna 0.37
Aeneas 0.36
Latinus 0.36
Juturna/Metiscus 0.36
Amata 0.36
Eumedes 0.36
Turnus' Troops 0.36
Faunus 0.36
Gods 0.25
Character
0 0.5 1 1.5
Eigenvector Centrality


ADC 12 - Pageranks
Turnus 0.19
Rutilians 0.07
Juturna 0.07
Juno 0.07
Jupiter 0.05
Aeneas' Troops 0.05
Gods 0.05
Aulestes 0.04
Character
0.00 0.05 0.10 0.15 0.20
Pagerank


ADC 12 - Betweeness Centrality
Turnus 82
Juturna 30
Aeneas 19.5
Juno 13
Latinus 3.5
Character
0 20 40 60 80 100
Betweenness Centrality


ADC 12 - Closeness Centrality
Juturna/Metiscus 0.44
Amata 0.44
Sacos 0.45
Latinus 0.48
Juturna 0.48
Aeneas 0.57
Turnus 0.75
Tolumnius 1.00
Iapyx 1.00
Messapus 1.00
Character
0.00 0.50 1.00 1.50
Closeness Centrality


ADC 1 - Clustering Coefficient
Turnus .16
Character
0 0.05 0.1 0.15 0.2
Clustering Coefficient

betweenness centrality, he remains a key player. Interestingly, however, Saces, who has such a low degree and a low weighted degree because of who he so selectively talks to, has such a high closeness centrality and thus a strong relationship to key players in the network.

The dynamic networks can also be used to consider the developing roles of characters throughout the novel. For example, we can examine the changing roles of characters that are steadily present in the *Aeneid*. Aeneas unsurprisingly speaks in eleven out of the twelve books of the *Aeneid* (see Figure 6). His role still varies across books as indicated by the different degrees and therefore the different partners. When he tends to be a receiver such as in Book 6, he does not transmit as much information and vice versa. Furthermore, as indicated by his high betweenness centrality values, he consistently remains a key figure in the transmission of information. As the protagonist, his information is not necessarily as interesting as when other key characters are taken into consideration. Venus plays a very prominent role in Book 1 as indicated by her weighted degree (Figure 7). Her high betweenness centrality value also suggests that she held a role as a broker of communication. Through the dynamic network, it is easy to explore the roles of the main characters of the *Aeneid* and to look at the network holistically.

7 Conclusion

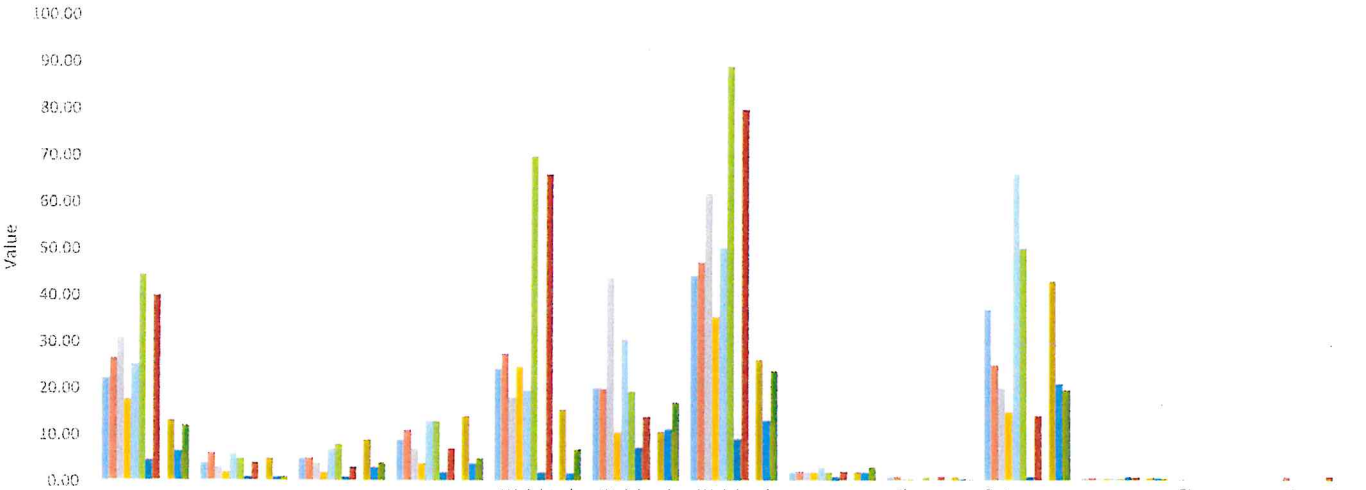
Franco Moretti remarks, "I did not need network *theory*; but I probably needed *networks*" as he believes that visualizations, such as those seen in Appendix I, help to further display the relationship structures of the network.[180] I argue however that the mathematical foundations of social network analysis make this interdisciplinary study of a familiar text so

[180] Moretti, 11.

interesting. Moreover, these calculations allow for us to reinterpret and reanalyze a classical epic. Just as noted by Kydros is the case for the *Iliad*, so too the *Aeneid* can also be read in different ways and interpreted in different levels.[181] Social network analysis allows for new perspectives on such a well-read text to be devised. More importantly, it provides a vocabulary with which to describe these networks and the quantitative calculations needed to objectively – or, at least, more objectively – contrast the roles of characters and the relationship structure of the epic. Being able to quantitatively state the importance of a character is quite powerful. Reading a text in this manner is also helpful in that "the success of an audience's interaction with a dramatic performance ultimately depends on the accurate mimesis of natural human social groups within the diegetic world."[182] As demonstrated through the real world calculations, Virgil overall captures the spirit of real world relationships, thus making a more compelling story for to be able to understand whether or not a text such as Vergil's *Aeneid* is able to capture these familiar relationship structures and to be able to study the roles of characters with greater depth.

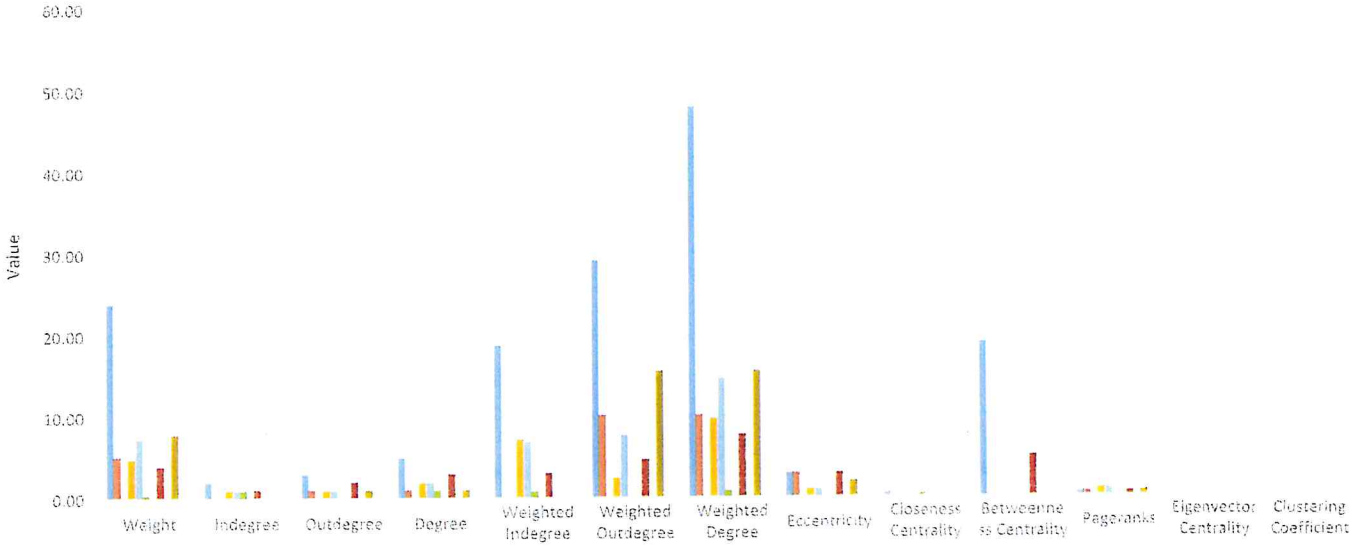
[181] Kydros, Notopoulos, and Exarchos, 130.
[182] Stiller and Hudson, 60.

Figure 6: Role of Aeneas



	Weight	Indegree	Outdegree	Degree	Weighted Indegree	Weighted Outdegree	Weighted Degree	Eccentricity	Closeness Centrality	Betweenness Centrality	Pageranks	Eigenvector Centrality	Clustering Coefficient
Book 1	22.12	4.00	5.00	9.00	24.21	20.03	44.24	2.00	1.00	37.00	0.67	0.35	0.35
Book 2	26.41	6.00	5.00	11.00	27.35	19.72	47.07	2.00	1.00	25.00	0.75	0.21	1
Book 3	30.91	3.00	4.00	7.00	18.03	43.77	61.80	2.00	0.62	20.00	0.75	0.00	0
Book 4	17.66	2.00	2.00	4.00	24.78	10.55	35.33	2.00	0.52	15.00	0.67	0.00	0
Book 5	25.11	6.00	7.00	13.00	19.54	30.68	50.22	3.00	0.00	66.00	0.71	0.03	0
Book 6	44.54	5.00	8.00	13.00	69.73	19.34	89.07	2.00	1.00	50.00	0.71	0.21	0.21
Book 7	4.58	1.00	1.00	2.00	1.38	7.29	9.17	1.00	0.01	1.00	1.00	0.00	0
Book 8	39.83	4.00	3.00	7.00	65.84	13.82	79.66	2.00	1.00	14.00	0.80	0.08	1
Book 9	0	0	0	0	0	0	0	0	0	0	0	0	0
Book 10	13.03	5.00	9.00	14.00	15.37	10.68	26.05	2.00	1.00	43.00	0.79	0.14	0.14
Book 11	6.56	1.00	3.00	4.00	1.83	11.28	13.11	2.00	0.51	21.00	0.71	0.00	0
Book 12	11.89	1.00	4.00	5.00	6.82	16.95	23.77	3.00	0.36	19.50	0.57	0.00	0

Figure 7: Role of Venus



	Weight	Indegree	Outdegree	Degree	Weighted Indegree	Weighted Outdegree	Weighted Degree	Eccentricity	Closeness Centrality	Betweenness Centrality	Pageranks	Eigenvector Centrality	Clustering Coefficient
Book 1	23.99	2.00	3.00	5.00	18.79	29.19	47.98	3.00	0.50	19.00	0.53	0.00	0
Book 2	5.06	0.00	1.00	1.00	0.00	10.12	10.12	3.00	0.00	0.00	0.47	0.00	0
Book 3	0	0	0	0	0	0	0	0	0	0	0	0	0
Book 4	4.86	1.00	1.00	2.00	7.28	2.44	9.72	1.00	0.04	0.00	1.00	0.00	0
Book 5	7.33	1.00	1.00	2.00	6.95	7.72	14.67	1.00	0.00	0.00	1.00	0.00	0
Book 6	0.43	1.00	0.00	1.00	0.85	0.00	0.85	0.00	0.36	0.00	0.00	0.00	
Book 7	0	0	0	0	0	0	0	0	0	0	0	0	0
Book 8	3.86	1.00	2.00	3.00	3.07	4.65	7.72	3.00	0.05	5.00	0.54	0.00	0
Book 9	0	0	0	0	0	0	0	0	0	0	0	0	0
Book 10	7.79	0.00	1.00	1.00	0.00	15.58	15.58	2.00	0.00	0.00	0.57	0.00	0
Book 11	0	0	0	0	0	0	0	0	0	0	0	0	0
Book 12	0	0	0	0	0	0	0	0	0	0	0	0	0

8 Appendices

Appendix 1: Conversational Network Break-Down:

For each book of the *Aeneid*, several key points of data. First, there is a full list of the speeches within the book. This table includes not only who speaks to whom but also who they are speaking about (when applicable) as well as the length and type of speech. The abbreviations for the types of speeches are as follows.

Abbreviations:[183]

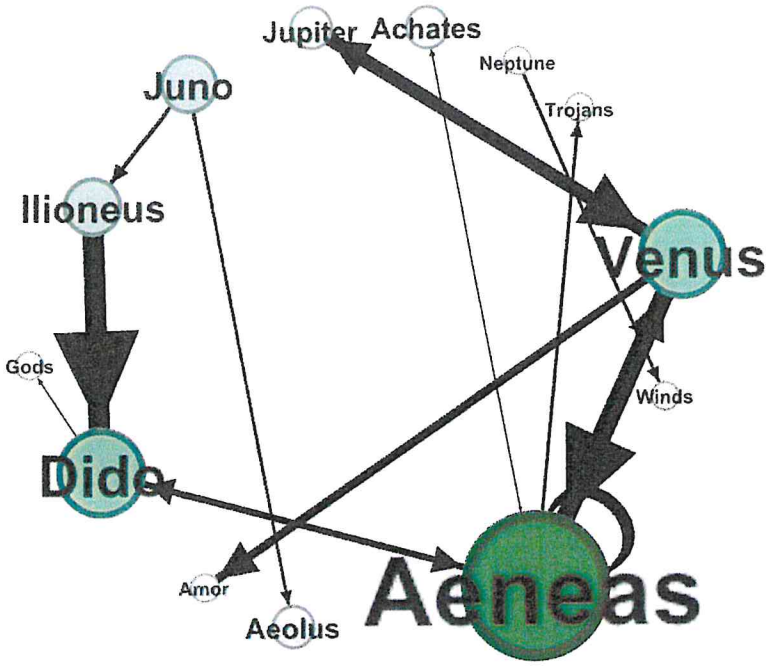
A = Apostrophe to one unable or unwilling to hear or reply
C = Command from a superior to an inferior or inferiors
D = Diplomatic or political speech
E = Encouragement or *cohortatio*, a speech by a commander to his men
F = Farewell
G = Greeting
L = Legalistic speech of self-defense or rebuttal
N = Narrative, explanation, description
O = Oracle, prophecy, or interpretation of omen or oracle
P = Persuasion
Pra = Prayer
Q = Question
R = Response to persuasion, question, or command
S= Soliloquy either thought or spoken
T = Taunt, challenge, threat
V = Vituperation

Next, there is the graph network that has been derived from the conversational network. Following then are the adjacency matrices with the first being the absolute values and the second being the normalized values. The rows represent the transmitters or speakers, and the columns represent the receivers or listeners. For example, in Book 1, Achates speaks a total of 26 words of Aeneas (or Aeneas hears 26 words from Achates). In other words, Achates speaks 1.12% of the dialogue in Book 2.

[183] Highet, 291.

Table of Contents for Appendix:

BOOK 1							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Juno	NONE	Pallas, Ajax, Oileus, Jupiter	80	37-49	12.75	S1
2	Juno	Aeolus	Jupiter, Deiopea	61	65-75	11	P1
3	Aeolus	Juno	Jupiter	30	76-80	4.58	R1
4	Aeneas	NONE	Tydeus, Diomedes, Aeacides, Hector, Sarpedon	52	94-101	7.58	S2
5	Neptune	Winds	Eurus, Aeolus	67	132-141	10	C1
6	Aeneas	Trojans	Scylla, Cyclopes	66	198-207	10	E1
7	Venus	Jupiter	Aeneas, Teucer, Antenor	162	229-253	24.67	P2
8	Jupiter	Venus	Aeneas, Ascanius, Hector, Mars, Ilia, Mars, Romulus, Remus, Assaracus, Caesar, Julius, Faith, Vesta, Quirinus, Rage	257	257-296	40	O1
9	Venus	Aeneas/Achates	NONE	23	321-324	3.58	C2
10	Aeneas	Venus	Phoebus	66	326-334	9	PRA1
11	Venus	Aeneas/Achates	Dido, Sychaeus, Pygmalion, Dido	226	335-370	35.25	N1
12	Aeneas	Venus	Jupiter	93	372-385	13.58	N2
13	Venus	Aeneas/Achates	Jupiter	101	387-401	15	O2
14	Aeneas	Venus	NONE	21	407-409	3	Q1
15	Aeneas	NONE	NONE	6	437	1	S3
16	Aeneas	Achates	Priam	35	459-463	4.58	P3
17	Ilioneus	Dido	Jupiter, Orion, Aeneas, Acestes, Iulus, Acestes	387	522-558	37	D1
18	Dido	Ilioneus	Saturn, Acestes, Aeneas	111	562-578	17	R2
19	Achates	Aeneas	(Venus)	26	582-585	4	P4
20	Aeneas	Dido (Trojans)	Aeneas, Dido	127	595-610	15.17	G1
21	Dido	Aeneas	Venus, Anchises, Teucer, Belus	103	615-630	16	G2
22	Venus	Amor	Typhoeus, Aeneas, Juno, Dido, (Ascanius)	167	664-688	25	P5
23	Dido	Jupiter and Others	Bacchus, Juno	33	731-735	5	PRA2
24	Dido	Aeneas	NONE	26	753-756	3.83	Q2

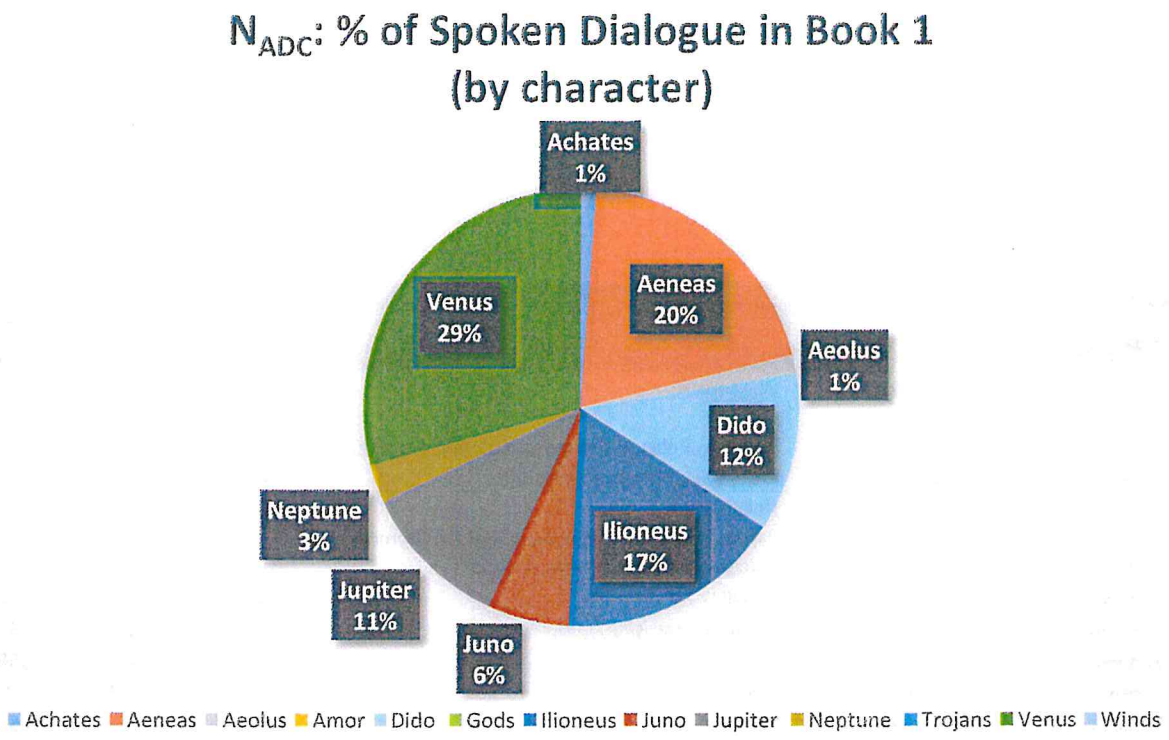


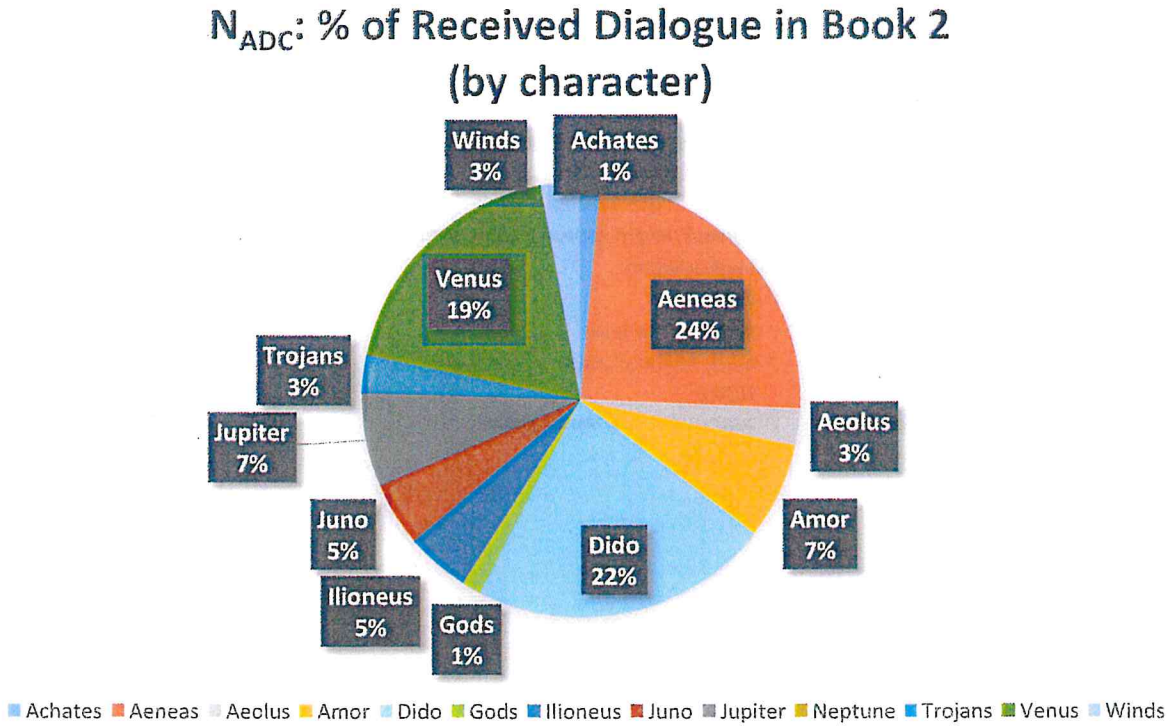
Book 1: Conversation Matrix

CHARACTERS	Achates	Aeneas	Aeolus	Amor	Dido	Gods	Ilioneus	Juno	Jupiter	Neptune	Trojans	Venus	Winds	TOTAL	%
Achates	0	26	0	0	0	0	0	0	0	0	0	0	0	26	1.12
Aeneas	35	58	0	0	127	0	0	0	0	0	66	180	0	466	20.03
Aeolus	0	0	0	0	0	0	0	30	0	0	0	0	0	30	1.29
Amor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Dido	0	129	0	0	0	33	111	0	0	0	0	0	0	273	11.74
Gods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Ilioneus	0	0	0	0	387	0	0	0	0	0	0	0	0	387	16.64
Juno	0	0	61	0	0	0	0	80	0	0	0	0	0	141	6.06
Jupiter	0	0	0	0	0	0	0	0	0	0	0	257	0	257	11.05
Neptune	0	0	0	0	0	0	0	0	0	0	0	0	67	67	2.88
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Venus	0	350	0	167	0	0	0	0	162	0	0	0	0	679	29.19
Winds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
TOTAL	35	563	61	167	514	33	111	110	162	0	66	437	67	2326	100.00
%	1.50	24.20	2.62	7.18	22.10	1.42	4.77	4.73	6.96	0.00	2.84	18.79	2.88	100.00	

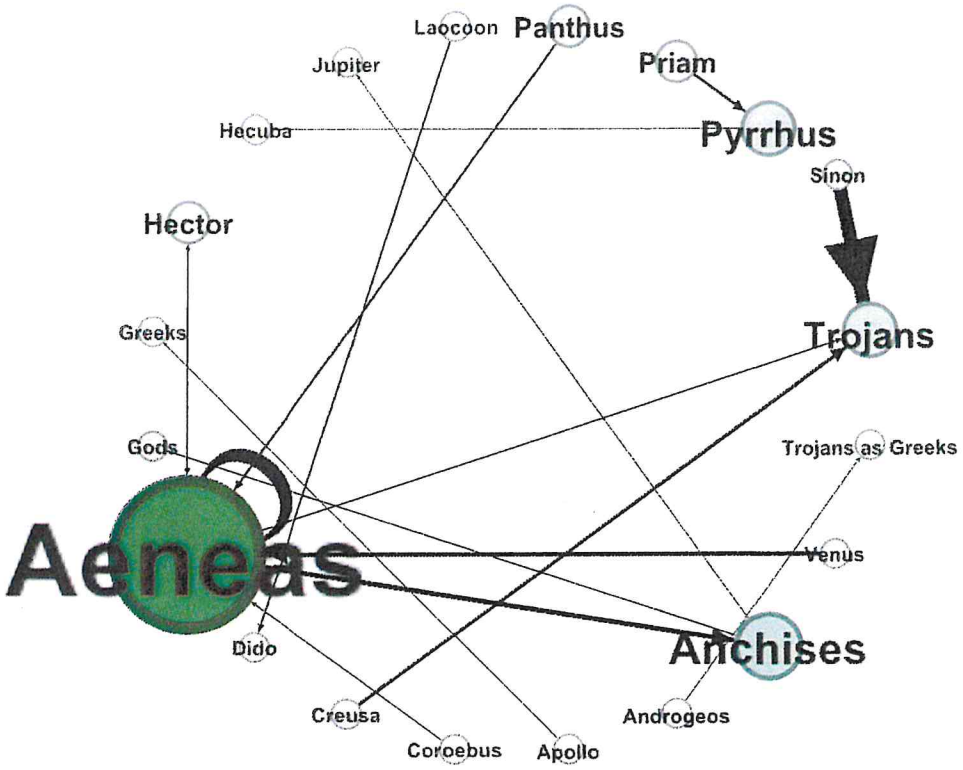
Book 1: Conversation Matrix (Normalized)

CHARACTERS	Achates	Aeneas	Aeolus	Amor	Dido	Gods	Ilioneus	Juno	Jupiter	Neptune	Trojans	Venus	Winds	TOTAL
Achates	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Aeneas	1.50	2.49	0.00	0.00	5.46	0.00	0.00	0.00	0.00	0.00	2.84	7.74	0.00	20.03
Aeolus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.00	0.00	1.29
Amor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dido	0.00	5.55	0.00	0.00	0.00	1.42	4.77	0.00	0.00	0.00	0.00	0.00	0.00	11.74
Gods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ilioneus	0.00	0.00	0.00	0.00	16.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.64
Juno	0.00	0.00	2.62	0.00	0.00	0.00	0.00	3.44	0.00	0.00	0.00	0.00	0.00	6.06
Jupiter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.05	0.00	11.05
Neptune	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.88	2.88
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Venus	0.00	15.05	0.00	7.18	0.00	0.00	0.00	0.00	6.96	0.00	0.00	0.00	0.00	29.19
Winds	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	1.50	24.20	2.62	7.18	22.10	1.42	4.77	4.73	6.96	0.00	2.84	18.79	2.88	100.00


N_{ADC}: % of Spoken Dialogue in Book 1 (by character)
Achates 1%
Aeneas 20%
Aeolus 1%
Dido 12%
Ilioneus 17%
Juno 6%
Jupiter 11%
Neptune 3%
Venus 29%
Achates Aeneas Aeolus Amor Dido Gods Ilioneus Juno Jupiter Neptune Trojans Venus Winds


N_{ADC}: % of Received Dialogue in Book 2 (by character)
Winds 3%
Achates 1%
Venus 19%
Aeneas 24%
Trojans 3%
Aeolus 3%
Jupiter 7%
Amor 7%
Juno 5%
Dido 22%
Ilioneus 5%
Gods 1%
Achates Aeneas Aeolus Amor Dido Gods Ilioneus Juno Jupiter Neptune Trojans Venus Winds

BOOK 2							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Laocoon	Dido	Ulysseus	54	42-49	7.830	P6
2	**Sinon**	Trojans (Priam)	Fortune, Belus, Palamedes, Calchas, Atridae, Eurypylus, Phoebus, Apollo	561	69-72 + 77-104 + 108-144 + 154-194	109.58	N3
3	Apollo	Greeks	NONE	19	116-119	3.25	O3
4	Priam	Sinon (Trojans)	Pallas, Tydeus, Diomedes, Ulysses, Tritonia, Calchas, Minerva, Priam, Pelops	30	148-151	4	Q3
5	Aeneas	Hector	NONE	30	281-286	6	Q4
6	Hector	Aeneas	Priam, Penates	41	289-295	6.92	C3
7	Aeneas	Panthus	Sinon	8	322	109.58	Q5
8	Panthus	Aeneas	NONE	72	324-335	12	N4
9	Aeneas	Trojans	NONE	41	348-354	6.58	E2
10	Androgeos	Trojans as Greeks	NONE	20	373-375	3	C4
11	Croebus	Trojans	NONE	30	387-391	4.25	P7
12	Hecuba	Priam	Hector	13	519-524	5	P8
13	Priam	Pyrrhus	(Polites), Achilles, Priam, Hector	63	535-543	8.75	T1
14	Pyrrhus	Priam	Peleus, Achilles, Neoptolemus	18	547-550	2.92	T2
15	Aeneas	NONE	Helen, (Menelaus), Priam	65	577-587	11	S4
16	Venus	Aeneas	Anchises, Creusa, Ascanius, Helen, Tyndareus, Paris, Neptune, Juno, Tritonian Pallas, Gorgon, Jupiter	171	594-620	27	N5
17	Anchises	Aeneas	Jupiter	73	638-649	11.5	C5
18	Aeneas	Anchises	Pyrrhus, Priam, Venus, Ascanius, Creusa	99	657-670	14	R3
19	Creusa	Aeneas	Iulus, Anchises	32	675-678	4	P9
20	Anchises	Jupiter	NONE	22	689-691	3	PRA3
21	Anchises	Gods	Ascanius, Aeneas	32	701-704	4	PRA4
22	Aeneas	Anchises	Iulus, Anchises, Creusa	90	707-720	14	C6
23	Anchises	Aeneas	NONE	10	733-734	1.5	C7
24	Creusa	Aeneas	Jupiter, Creusa, Venus, Cybele	95	776-789	14	O4

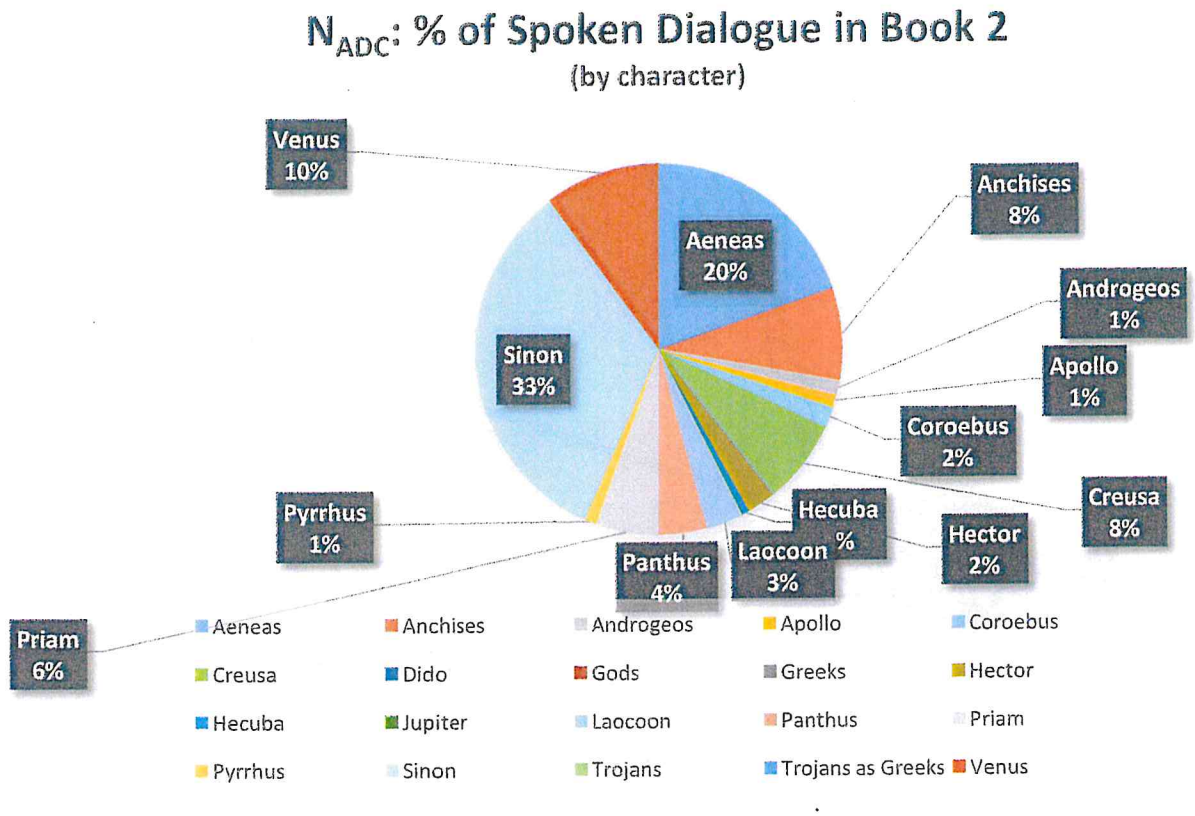


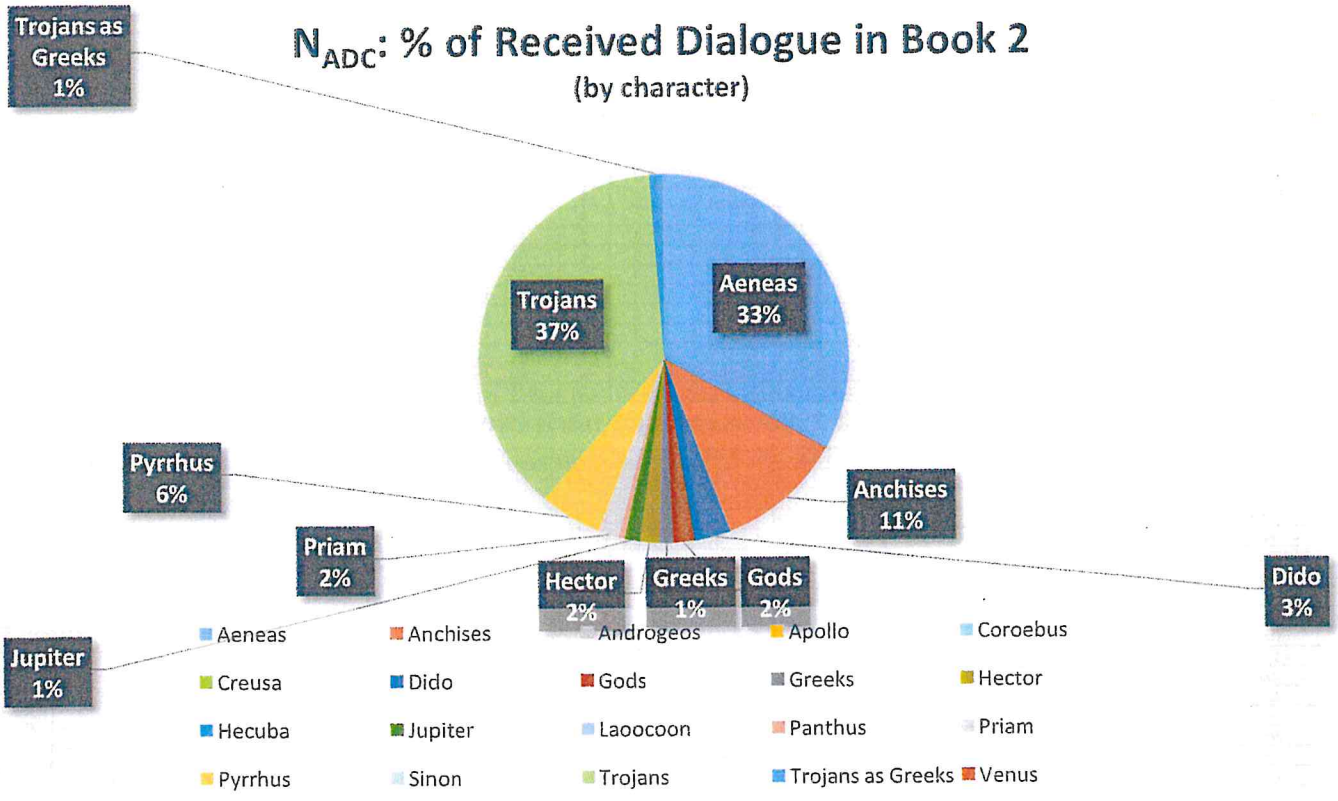
Book 2: Conversation Matrix

CHARACTERS	Aeneas	Anchises	Androgeos	Apollo	Coroebus	Creusa	Dido	Gods	Greeks	Hector	Hecuba	Jupiter	Laocoon	Panthus	Priam	Pyrrhus	Sinon	Trojans	Trojans as Greeks	Venus	TOTALS	%
Aeneas	65	189	0	0	0	0	0	0	0	30	0	0	0	8	0	0	0	41	0	0	333	19.72
Anchises	83	0	0	0	0	0	0	32	0	0	0	22	0	0	0	0	0	0	0	0	137	8.11
Androgeos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	1.18
Apollo	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	19	1.12
Coroebus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	30	1.78
Creusa	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	127	7.52
Dido	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Gods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Greeks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Hector	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	2.43
Hecuba	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	13	0.77
Jupiter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Laocoon	0	0	0	0	0	0	54	0	0	0	0	0	0	0	0	0	0	0	0	0	54	3.20
Panthus	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	4.26
Priam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	0	0	0	93	5.51
Pyrrhus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	0	18	1.07
Sinon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	561	0	0	561	33.21
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Trojans as Greeks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Venus	171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	171	10.12
TOTAL	559	189	0	0	0	0	54	32	19	30	0	22	0	8	31	93	0	632	20	0	1689	100.00
%	33.10	11.19	0.00	0.00	0.00	0.00	3.20	1.89	1.12	1.78	0.00	1.30	0.00	0.47	1.84	5.51	0.00	37.42	1.18	0.00	100.00	

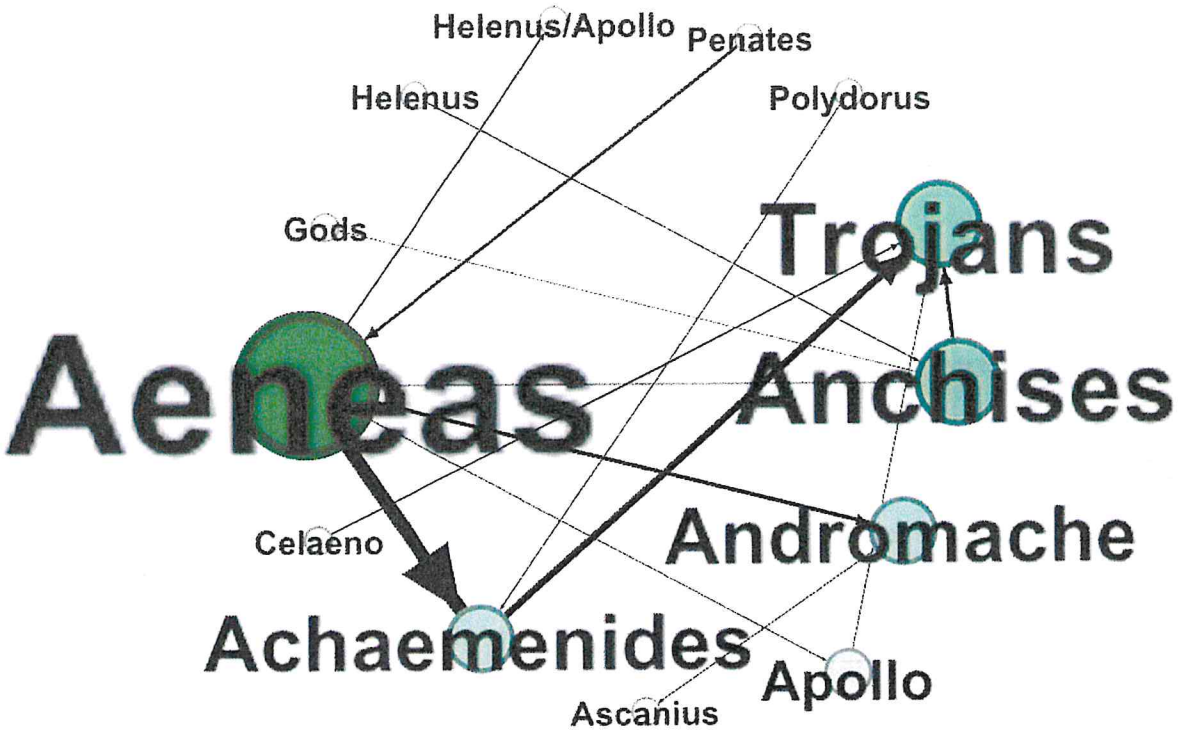
Book 2: Conversation Matrix (Normalized)

CHARACTERS	Aeneas	Anchises	Androgeos	Apollo	Coroebus	Creusa	Dido	Gods	Greeks	Hector	Hecuba	Jupiter	Laocoon	Panthus	Priam	Pyrrhus	Sinon	Trojans	Trojans as Greeks	Venus	TOTALS
Aeneas	3.85	11.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.00	0.00	0.00	0.47	0.00	0.00	0.00	2.43	0.00	0.00	19.72
Anchises	4.91	0.00	0.00	0.00	0.00	0.00	0.00	1.89	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.11
Androgeos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	1.18
Apollo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Coroebus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.00	0.00	1.78
Creusa	7.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.52
Dido	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greeks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hector	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.43
Hecuba	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.77
Jupiter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Laocoon	0.00	0.00	0.00	0.00	0.00	0.00	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.20
Panthus	4.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26
Priam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.51	0.00	0.00	0.00	0.00	5.51
Pyrrhus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.00	0.00	1.07
Sinon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.21	0.00	0.00	33.21
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trojans as Greeks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Venus	10.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.12
TOTAL	33.10	11.19	0.00	0.00	0.00	0.00	3.20	1.89	1.12	1.78	0.00	1.30	0.00	0.47	1.84	5.51	0.00	37.42	1.18	0.00	100.00


N_{ADC}: % of Spoken Dialogue in Book 2
(by character)
Venus 10%
Aeneas 20%
Anchises 8%
Androgeos 1%
Apollo 1%
Coroebus 2%
Creusa 8%
Hecuba 2%
Laocoon 3%
Panthus 4%
Pyrrhus 1%
Priam 6%
Sinon 33%
Aeneas
Anchises
Androgeos
Apollo
Coroebus
Creusa
Dido
Gods
Greeks
Hector
Hecuba
Jupiter
Laocoon
Panthus
Priam
Pyrrhus
Sinon
Trojans
Trojans as Greeks
Venus


N_{ADC}: % of Received Dialogue in Book 2
(by character)
Trojans as Greeks 1%
Aeneas 33%
Trojans 37%
Pyrrhus 6%
Anchises 11%
Priam 2%
Hector 2%
Greeks 1%
Gods 2%
Dido 3%
Jupiter 1%
Aeneas
Anchises
Androgeos
Apollo
Coroebus
Creusa
Dido
Gods
Greeks
Hector
Hecuba
Jupiter
Laocoon
Panthus
Priam
Pyrrhus
Sinon
Trojans
Trojans as Greeks
Venus

BOOK 3							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Polydorus	Aeneas	NONE	43.00	41-46	6.00	C8
2	Aeneas	Apollo	Achilles	36.00	85-89	5.00	PRA5
3	Apollo	Trojans	Dardanus, Aeneas	33.00	94-98	5.00	O5
4	Anchises	Trojans	Jupiter, Teucer, Cybele	99.00	103-117	14.92	O6
5	Penates	Aeneas	Apollo, Dardanus, Iasius, Jupiter	122.00	154-171	18.00	O7
6	Anchises	Aeneas and Trojans	Cassandra, Phoebus	44.00	182-188	6.75	C9
7	Celaeno	Trojans	Laomedon, Jupiter, Phoebus,	67.00	247-257	11.00	O8
8	Anchises	Gods	NONE	11.00	265-266	1.58	PRA6
9	Andromache	Aeneas	Hector	18.00	310-312	2.25	Q6
10	Aeneas	Andromache	Hector, Pyrrhus	31.00	315-319	5.00	Q7
11	Andromache	Aeneas	Priam, Cassandra, Achilles, Leda, Hermione, Helenus, Orestes, Neoptolemus, Ascanius, Hector, Bacchus	142.00	321-343	23.00	N6
12	Aeneas	Helenus/Apollo	Phoebus, Celaeno	65.00	359-368	10.00	Q8
13	Helenus/Apollo	Aeneas	Jupiter, Fates, Helenus, Juno, Circe, Apollo, Idomeneus, Philoctetes, Charybdis, Scylla, Sibyl	577.00	374-462	89.00	O9
14	Helenus	Anchises	Venus, Apollo, Aeneas	46.00	475-481	6.92	F1
15	Andromache	Ascanius	Astyanax	42.00	486-491	6.00	F2
16	Aeneas	Andromache/Helenus	Dardanus	82.00	493-505	13.00	F3
17	Anchises	Gods	NONE	13.00	528-529	2.00	PRA7
18	Anchises	Trojans	NONE	28.00	539-543	3.83	O10
19	Anchises	Trojans	Charybdis, Helenus	17.00	558-560	2.58	C10
20	Achaemenides	Trojans	Ulysses, Adamastus, Cyclops, Phoebus, Polyphemus,	291.00	599-606 + 613-654	49.42	N7

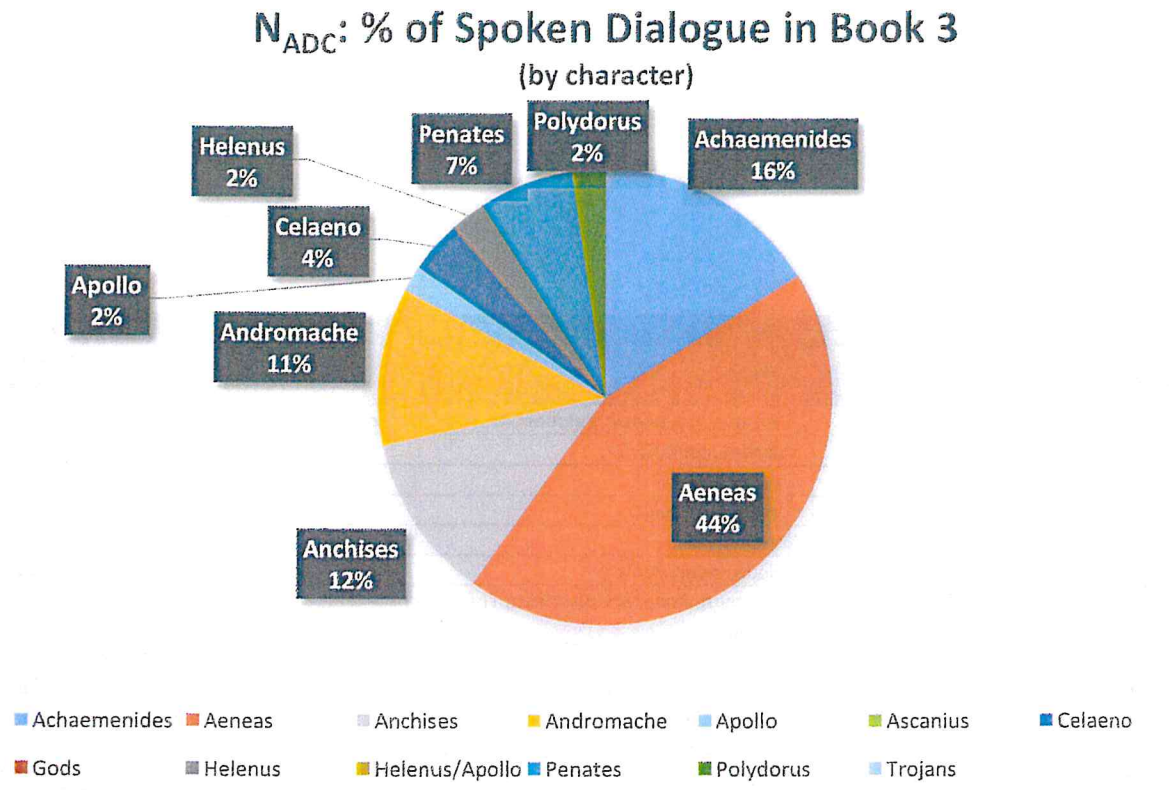


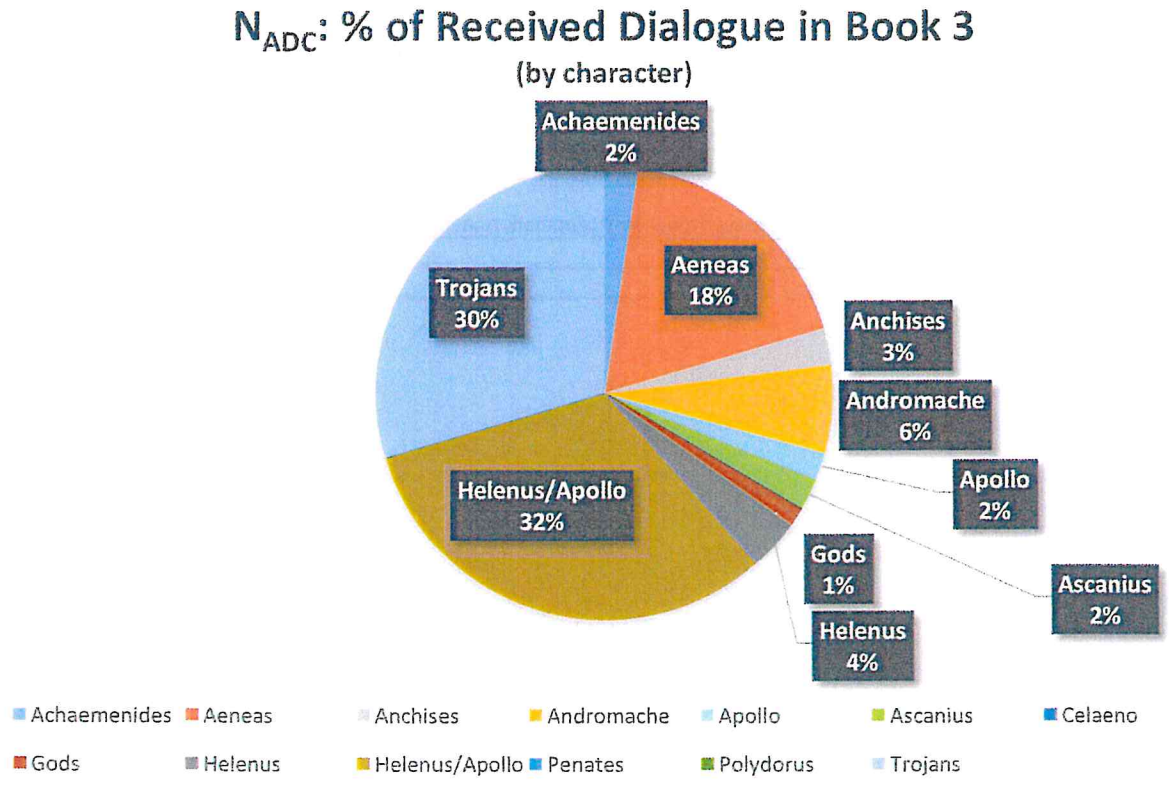
Book 3: Conversation Matrix

CHARACTERS	Achaemenides	Aeneas	Anchises	Andromache	Apollo	Ascanius	Calaeno	Gods	Helenus	Helenus/Apollo	Penates	Polydorus	Trojans	TOTAL	%
Achaemenides	0	0	0	0	0	0	0	0	0	0	0	0	291	291	16.10
Aeneas	0	0	0	113	36	0	0	0	65	577	0	0	0	791	43.77
Anchises	0	44	0	0	0	0	0	24	0	0	0	0	144	212	11.73
Andromache	0	160	0	0	0	42	0	0	0	0	0	0	0	202	11.18
Apollo	0	0	0	0	0	0	0	0	0	0	0	0	33	33	1.83
Ascanius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Celaeno	0	0	0	0	0	0	0	0	0	0	0	0	67	67	3.71
Gods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Helenus	0	0	46	0	0	0	0	0	0	0	0	0	0	46	2.55
Helenus/Apollo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Penates	0	122	0	0	0	0	0	0	0	0	0	0	0	122	6.75
Polydorus	43	0	0	0	0	0	0	0	0	0	0	0	0	43	2.38
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
TOTAL	43	326	46	113	36	42	0	24	65	577	0	0	535	1807	100.00
%	2.38	18.04	2.55	6.25	1.99	2.32	0.00	1.33	3.60	31.93	0.00	0.00	29.61	100.00	

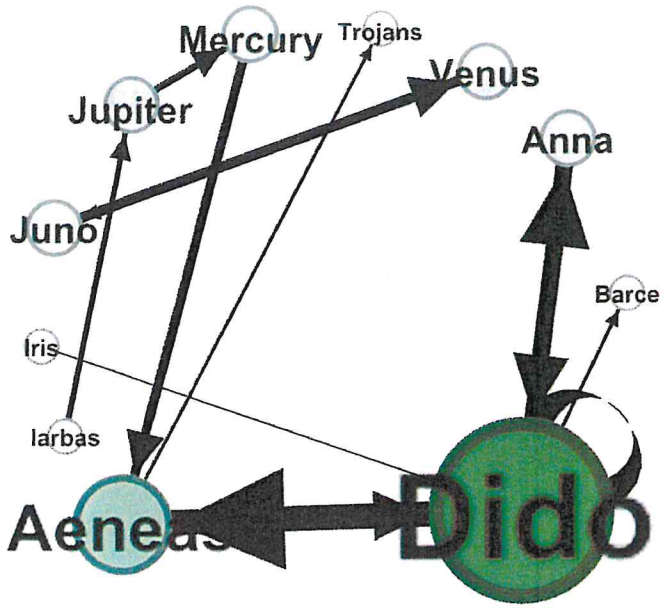
Book 3: Conversation Matrix (Normalized)

CHARACTERS	Achaemenides	Aeneas	Anchises	Andromache	Apollo	Ascanius	Calaeno	Gods	Helenus	Helenus/Apollo	Penates	Polydorus	Trojans	TOTAL
Achaemenides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.10	16.10
Aeneas	0.00	0.00	0.00	6.25	1.99	0.00	0.00	0.00	3.60	31.93	0.00	0.00	0.00	43.77
Anchises	0.00	2.43	0.00	0.00	0.00	0.00	0.00	1.33	0.00	0.00	0.00	0.00	7.97	11.73
Andromache	0.00	8.85	0.00	0.00	0.00	2.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.18
Apollo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	1.83
Ascanius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Celaeno	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.71	3.71
Gods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Helenus	0.00	0.00	2.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.55
Helenus/Apollo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Penates	0.00	6.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.75
Polydorus	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	2.38	18.04	2.55	6.25	1.99	2.32	0.00	1.33	3.60	31.93	0.00	0.00	29.61	100.00


N_{ADC}: % of Spoken Dialogue in Book 3
(by character)
Helenus 2%
Penates 7%
Polydorus 2%
Achaemenides 16%
Celaeno 4%
Apollo 2%
Andromache 11%
Aeneas 44%
Anchises 12%
Achaemenides
Aeneas
Anchises
Andromache
Apollo
Ascanius
Celaeno
Gods
Helenus
Helenus/Apollo
Penates
Polydorus
Trojans


N_{ADC}: % of Received Dialogue in Book 3
(by character)
Achaemenides 2%
Aeneas 18%
Trojans 30%
Anchises 3%
Andromache 6%
Apollo 2%
Helenus/Apollo 32%
Gods 1%
Ascanius 2%
Helenus 4%
Achaemenides
Aeneas
Anchises
Andromache
Apollo
Ascanius
Celaeno
Gods
Helenus
Helenus/Apollo
Penates
Polydorus
Trojans

BOOK 4							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Dido	Anna	Aeneas, Sychaeus, Pygmalion, Jupiter, Shame	45	9-29	21.00	N8
2	Anna	Dido	Iarbas, Juno, Orion	141	31-53	22.75	D2
3	Juno	Venus	Aeneas, Dido	79	93-104	12.00	P10
4	Venus	Juno	Fortune, Jupiter	53	107-114	6.67	R4
5	Juno	Venus	Aeneas, Dido	79	115-127	12.42	P11
6	Iarbas	Jupiter	Dido, Aeneas, Paris	82	206-218	13.00	PRA8
7	Jupiter	Mercury	Zephyrs, Aeneas, Fates, Venus, Teucer, Ascanius	103	223-237	15.00	C11
8	Mercurius	Aeneas	Dido, Jupiter, Ascanius	73	265-276 (omit 273)	9.83	C12
9	Dido	Aeneas	Pygmalion, Iarbas	183	305-330	26.00	P12
10	Aeneas	Dido	Priam, Apollo, Anchises, Ascanius, Jupiter, Mercury	188	333-361	28.58	L1
11	Dido	Aeneas	Venus, Dardanus, Caucasus, Juno, Saturn, Apollo, Jupiter	167	365-387	23.00	R5
12	Dido	Anna	Aeneas, Anchises	141	416-346	21.00	P13
13	Dido	Anna	Atlas, priestess	132	478-498	21.00	C13
14	Dido	NONE	Laomedon, Sychaeus, Anna	128	534-552	19.00	S5
15	Mercury	Aeneas	Dido	70	560-570	10.17	C14
16	Aeneas	Trojans	Mercury	41	573-759	6.67	C15
17	Dido	NONE	Aeneas, Ascanius, Sun, Juno, Hecate, Furies, Jupiter	261	590-629	30.50	S6
18	Dido	Barce	Anna, Pluto	46	634-640	7.00	C16
19	Dido	NONE	Fortune, Sychaeus, Pygmalion, Aeneas	77	651-658 + 659-662	11.33	S7
20	Anna	Dido	NONE	72	675-685	10.25	A1
21	Iris	Dido	Dis	10	702-703	1.33	N9

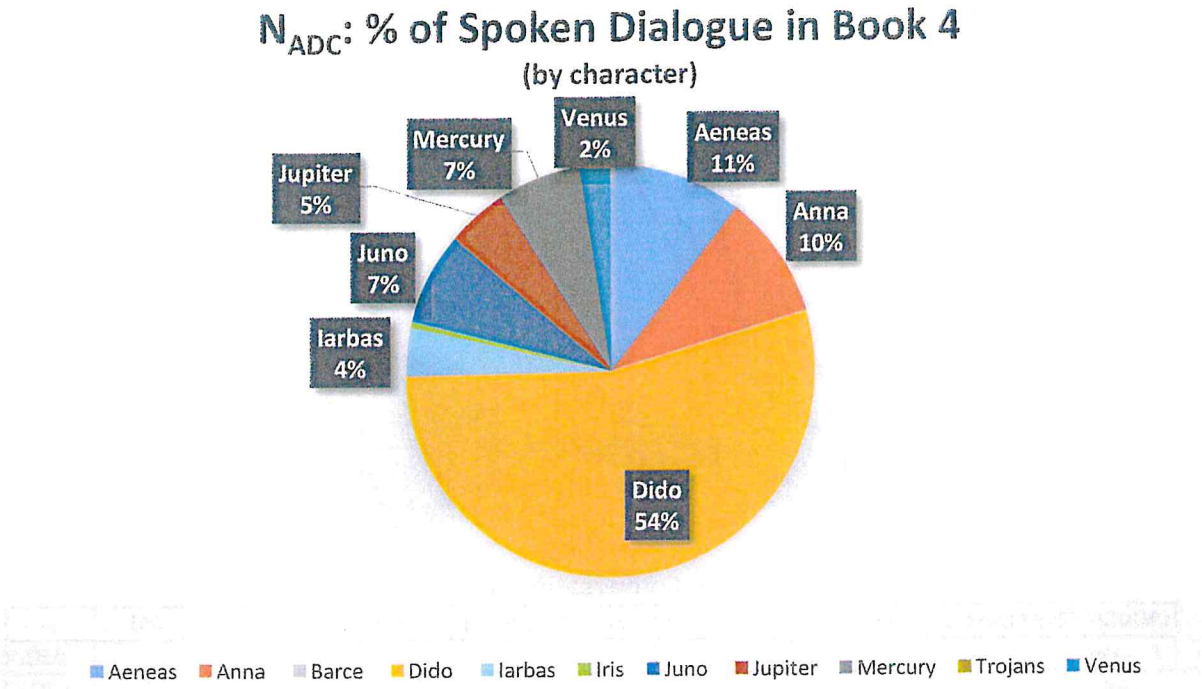


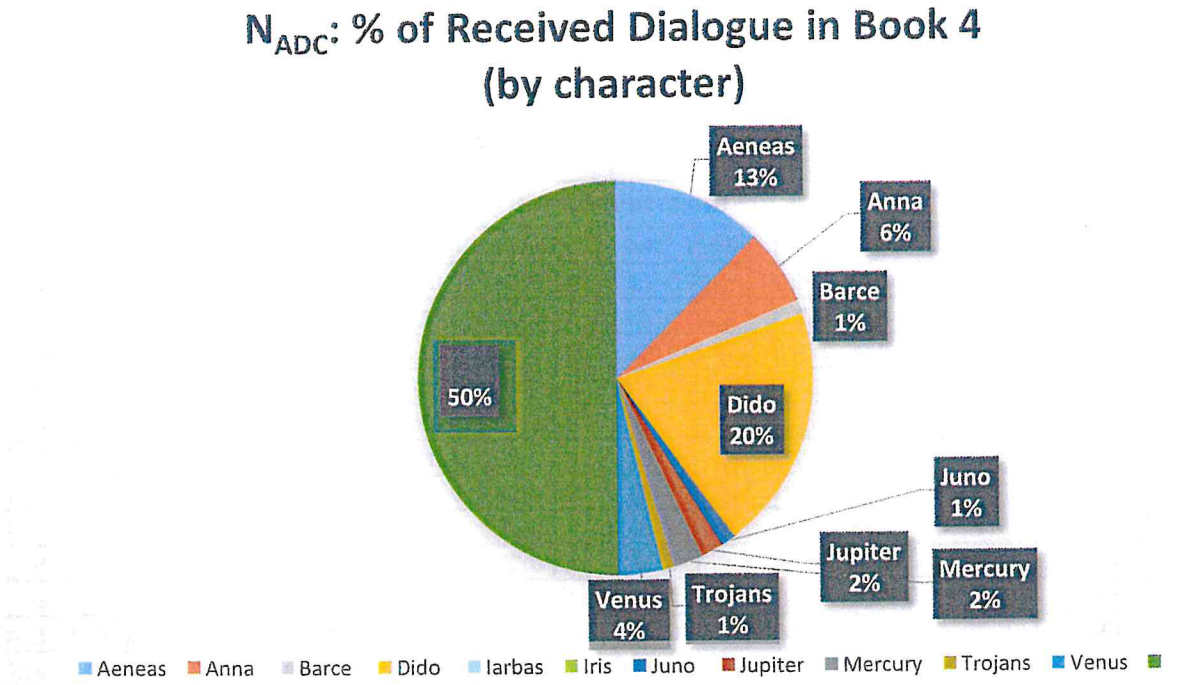
Book 4: Conversation Matrix

CHARACTERS	Aeneas	Anna	Barce	Dido	Iarbas	Iris	Juno	Jupiter	Mercury	Trojans	Venus	TOTAL	%
Aeneas	0	0	0	188	0	0	0	0	0	41	0	229	10.55
Anna	0	0	0	213	0	0	0	0	0	0	0	213	9.81
Barce	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Dido	395	273	46	466	0	0	0	0	0	0	0	1180	54.35
Iarbas	0	0	0	0	0	0	0	82	0	0	0	82	3.78
Iris	0	0	0	10	0	0	0	0	0	0	0	10	0.46
Juno	0	0	0	0	0	0	0	0	0	0	158	158	7.28
Jupiter	0	0	0	0	0	0	0	0	103	0	0	103	4.74
Mercury	143	0	0	0	0	0	0	0	0	0	0	143	6.59
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Venus	0	0	0	0	0	0	53	0	0	0	0	53	2.44
TOTAL	538	273	46	877	0	0	53	82	103	41	158	2171	100.00
%	24.78	12.57	2.12	40	0	0	2.4	3.777	4.7444	1.889	7.278	100	

Book 4: Conversation Matrix (Normalized)

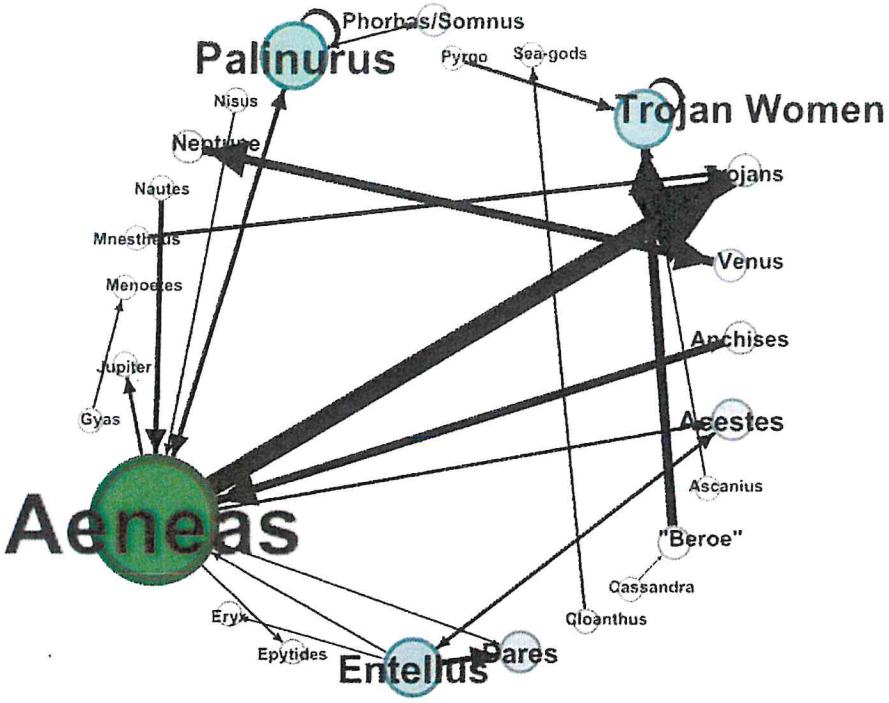
CHARACTERS	Aeneas	Anna	Barce	Dido	Iarbas	Iris	Juno	Jupiter	Mercury	Trojans	Venus	TOTAL
Aeneas	0.00	0.00	0.00	8.66	0.00	0.00	0.00	0.00	0.00	1.89	0.00	10.55
Anna	0.00	0.00	0.00	9.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.81
Barce	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dido	18.19	12.57	2.12	21.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.35
Iarbas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.78	0.00	0.00	0.00	3.78
Iris	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46
Juno	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.28	7.28
Jupiter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.74	0.00	0.00	4.74
Mercury	6.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.59
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Venus	0.00	0.00	0.00	0.00	0.00	0.00	2.44	0.00	0.00	0.00	0.00	2.44
TOTAL	24.78	12.57	2.12	40.40	0.00	0.00	2.44	3.78	4.74	1.89	7.28	100.00


N_{ADC}: % of Spoken Dialogue in Book 4
(by character)
Venus 2%
Aeneas 11%
Mercury 7%
Jupiter 5%
Anna 10%
Juno 7%
Iarbas 4%
Dido 54%
Aeneas Anna Barce Dido Iarbas Iris Juno Jupiter Mercury Trojans Venus


N_{ADC}: % of Received Dialogue in Book 4
(by character)
Aeneas 13%
Anna 6%
Barce 1%
50%
Dido 20%
Juno 1%
Jupiter 2%
Mercury 2%
Venus 4%
Trojans 1%
Aeneas Anna Barce Dido Iarbas Iris Juno Jupiter Mercury Trojans Venus

BOOK 5							
	SPEAKER	RECEIVER		WORDS	LINES	# OF LINES	TYPE
1	Palinurus	NONE	Neptune	10	13-14	1.58	A2
2	Palinurus	Aeneas	Jupiter, Fortune, Eryx	59	17-25	9.83	P14
3	Aeneas	Palinurus	Acestes, Anchises	38	26-31	5.58	C17
4	Aeneas	Trojans	Dardanus, Anchises, Acestes, Penates, Dawn	175	45-71	27.00	C18
5	Aeneas	Anchises	Anchises	24	80-83	4.00	G3
6	Gyas	Menoetes	NONE	25	162-164 + 166	3.25	C19
7	Mnestheus	Trojans	Hector, Mnestheus, Neptune	53	189-197	8.00	C20
8	Cloanthus	Sea-gods	NONE	30	235-238	4.00	PRA9
9	Aeneas	Trojans	NONE	67	304-314	11.33	C21
10	Aeneas	Trojans	NONE	17	348-350	2.42	R6
11	Nisus	Aeneas	Fortune, Salius	26	353-356	3.58	Q9
12	Aeneas	Trojans	NONE	14	363-364	2.00	C22
13	Dares	Aeneas	NONE	19	383-385	2.42	P15
14	Acestes	Entellus	Erx	33	389-393	5.58	P16
15	Entellus	Acestes	NONE	45	394-400	6.33	R7
16	Entellus	Dares	hercules, Eryx, Alcides, Dares, Aeneas, Acestes	76	410-420	11.33	P17
17	Aeneas	Dares	NONE	14	465-467	2.25	C23
18	Entellus	Aeneas and Trojans	Dares	21	474-476	2.83	C24
19	Entellus	Eryx	Eryx, Dares	14	483-484	2.00	PRA10
20	Aeneas	Acestes	Jupiter, Anchises, Cisseus	38	533-538	6.33	C25
21	Aeneas	Epytides	Ascanius	23	548-551	3.08	C26
22	Trojan Women	NONE	NONE	8	615-616		
23	"Beroe"	Trojan Women	Fortune, Eryx, Acestes, Penates, Hector, Cassandra, Neptune	128	623-640	17.83	P18
24	Cassandra	"Beroe"	NONE	7	637-638	0.83	O11
25	Pyrgo	Trojan Women	Beroe, Doryclus, Anchises	44	646-652	7.00	N10
26	Ascanius	Trojan women	NONE	23	670-673	3.08	C27
27	Aeneas	Jupiter	NONE	41	687-692	6.33	PRA11

28	Nautes	Aeneas	Fates, Acestes	67	709-718	10.00	P19
29	Anchises	Aeneas	Jupiter, Nautes, Dis, Sibyl, Night, East	112	724-739	16.00	C28
30	Aeneas	Anchises	NONE	13	741-742	1.58	Q10
31	Venus	Neptune	Juno, Fate, Jupiter, Aeolus	120	781-798	18.00	P20
32	Neptunus	Venus	Aeneas, Achilles, Peleus, Achilles	108	800-815	16.00	R8
33	Somnus (Phorbas)	Palinurus	Iasus	26	843-846	4.00	P21
34	Palinurus	Somnus	Aeneas	24	848-851	4.00	R9
35	Aeneas	Palinurus	NONE	13	870-871	2.00	A3

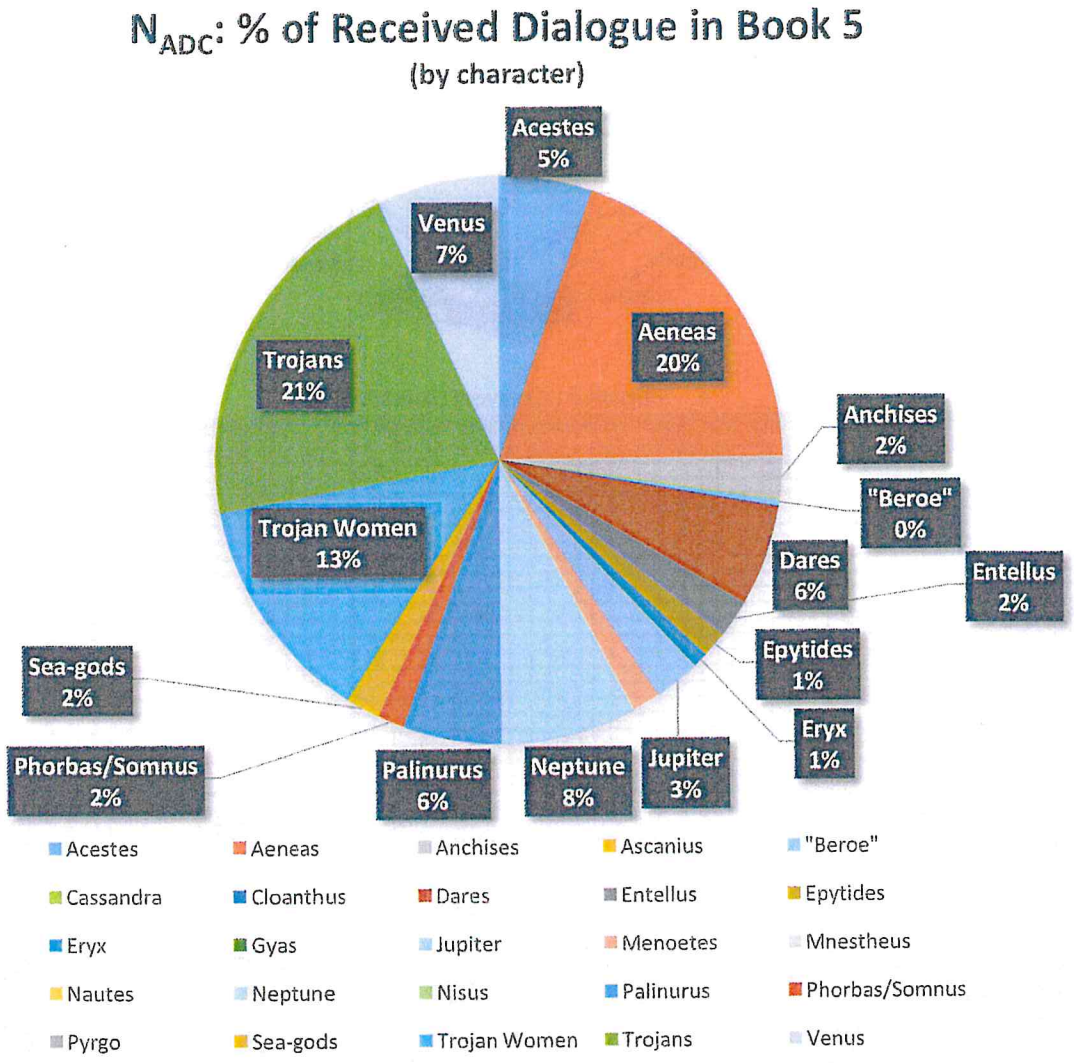


Book 5: Conversation Matrix

CHARACTERS	Acestes	Aeneas	Anchises	Ascanius	"Beroe"	Cassandra	Cloanthus	Dares	Entellus	Epytides	Eryx	Gyas	Jupiter	Menoetes	Mnestheus	Nautes	Neptune	Nisus	Palinurus	Phorbas/Somnus	Pyrgo	Sea-gods	Trojan Women	Trojans	Venus	TOTAL	%
Acestes	0	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	2.12
Aeneas	38	0	37	0	0	0	0	14	0	23	0	0	41	0	0	0	0	0	51	0	0	0	0	273	0	477	30.68
Anchises	0	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112	7.20
Ascanius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	23	1.48
"Beroe"	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	128	0	0	128	8.23
Cassandra	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0.45
Cloanthus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	30	1.93
Dares	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	1.22
Entellus	45	21	0	0	0	0	0	76	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156	10.03
Epytides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Eryx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Gyas	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	25	1.61
Jupiter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Menoetes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Mnestheus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0	53	3.41
Nautes	0	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67	4.31
Neptune	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	108	108	6.95
Nisus	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	1.67
Palinurus	0	59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	24	0	0	0	0	0	93	5.98
Phorbas/Somnus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	0	0	0	0	0	26	1.67
Pyrgo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	0	0	44	2.83
Sea-gods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Trojan Women	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	0.51
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Venus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	0	0	0	0	0	0	0	0	120	7.72
TOTAL	83	304	37	0	7	0	0	90	33	23	14	0	41	25	0	0	120	0	87	24	0	30	203	326	108	1555	100.00
%	5.34	19.55	2.38	0.00	0.45	0.00	0.00	5.79	2.12	1.48	0.90	0.00	2.64	1.61	0.00	0.00	7.72	0.00	5.59	1.54	0.00	1.93	13.05	20.96	6.95	100.00	

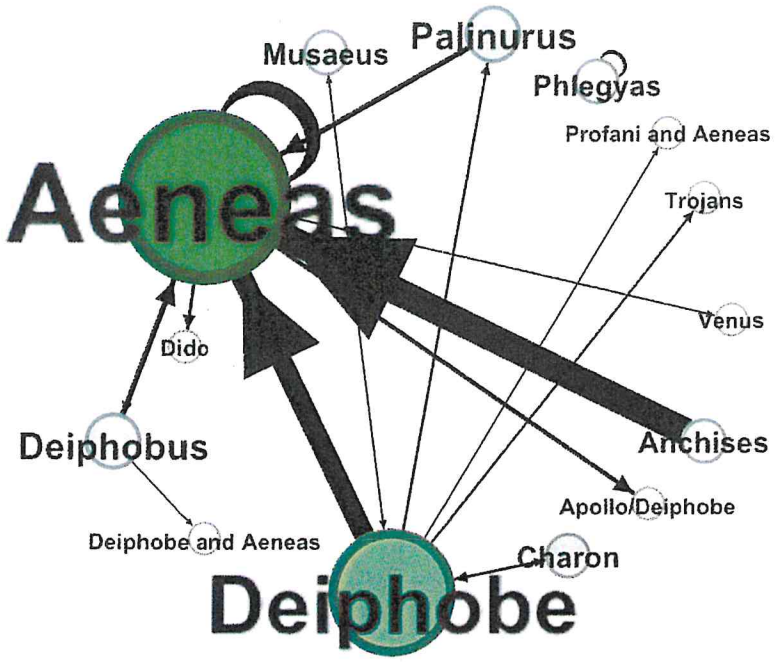
Book 5: Conversation Matrix (Normalized)

CHARACTERS	Acestes	Aeneas	Anchises	Ascanius	"Beroe"	Cassandra	Cloanthus	Dares	Entellus	Epytides	Eryx	Gyas	Jupiter	Menoetes	Mnestheus	Nautes	Neptune	Nisus	Palinurus	Phorbas/Somnus	Pyrgo	Sea-gods	Trojan Women	Trojans	Venus
Acestes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aeneas	2.44	0.00	2.38	0.00	0.00	0.00	0.00	0.90	0.00	1.48	0.00	0.00	2.64	0.00	0.00	0.00	0.00	0.00	3.28	0.00	0.00	0.00	0.00	17.56	0.00
Anchises	0.00	7.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ascanius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	0.00
"Beroe"	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.23	0.00	0.00
Cassandra	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cloanthus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.00	0.00	0.00
Dares	0.00	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Entellus	2.89	1.35	0.00	0.00	0.00	0.00	0.00	4.89	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Epytides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eryx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gyas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jupiter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Menoetes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mnestheus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.41	0.00
Nautes	0.00	4.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neptune	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.95
Nisus	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Palinurus	0.00	3.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	1.54	0.00	0.00	0.00	0.00
Phorbas/Somnus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00
Pyrgo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.83	0.00	0.00	0.00
Sea-gods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trojan Women	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Venus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	5.34	19.55	2.38	0.00	0.45	0.00	0.00	5.79	2.12	1.48	0.90	0.00	2.64	1.61	0.00	0.00	7.72	0.00	5.59	1.54	0.00	1.93	13.05	20.96	6.95


N_{ADC}: % of Received Dialogue in Book 5
(by character)
Acestes 5%
Aeneas 20%
Anchises 2%
"Beroe" 0%
Dares 6%
Entellus 2%
Epytides 1%
Eryx 1%
Jupiter 3%
Neptune 8%
Palinurus 6%
Phorbas/Somnus 2%
Sea-gods 2%
Trojan Women 13%
Trojans 21%
Venus 7%
Acestes
Aeneas
Anchises
Ascanius
"Beroe"
Cassandra
Cloanthus
Dares
Entellus
Epytides
Eryx
Gyas
Jupiter
Menoetes
Mnestheus
Nautes
Neptune
Nisus
Palinurus
Phorbas/Somnus
Pyrgo
Sea-gods
Trojan Women
Trojans
Venus

BOOK 6							
	SPEAKER	RECEIVER		WORDS	LINES	# OF LINES	TYPE
1	Deiphobe	Aeneas	NONE	20	37-39	3.00	C29
2	Deiphobe	Aeneas	Apollo	6	45-46	0.75	C30
3	Deiphobe	Aeneas	NONE	16	51-53	2.08	C31
4	Aeneas	Apollo and Deiphobe	Paris, Aeacus, Achilles, Phoebus, Trivia	131	56-76	20.42	PRA12
5	Deiphobe	Trojans	Dardanus, Achilles, Juno, Turnus	105	83-97	15.00	O12
6	Aeneas	Deiphobe	Pluto, Anchises, Hecate, Orpheus, Pollux, Theseus, Hercules, Jupiter	138	103-123	20.42	P22
7	Deiphobe	Aeñeas	Anchises, Dis, Jupiter, Juno, Proserpine, Fate	202	125-155	29.67	C32
8	Aeneas	NONE	Misenus	23	187-189	3.00	PRA13
9	Aeneas	Doves and Venus	NONE	27	194-197	3.25	PRA14
10	Deiphobe	Profani and Aeneas	NONE	21	258-261	3.17	C33
11	Aeneas	Diephobe	NONE	22	318-320	2.92	A11
12	Deiphobe	Aeneas	Anchises, Charon	60	322-330	9.00	N11
13	Aeneas	Palinurus	Apollo	38	341-346	5.83	Q12
14	Palinurus	Aeneas	Apollo, Anchises, Notus, Anchises, Iulus, Venus	171	347-371	24.75	N12
15	Deiphobe	Palinurus	Furies	56	373-381	9.00	C34
16	Charon	Deiphobe	Sleep, Night, Hercules, Theseus, Pirithous, Dis	68	388-397	10.00	C35
17	Deiphobe	Charon	Proserpine, Pluto, Aeneas, Anchises	49	399-497	7.50	P23
18	Aeneas	Dido	Fate	81	456-466	11.00	P24
19	Aeneas	Deiphobus	Teucer, Rumor	61	500-508	9.00	Q13
20	Deiphobus	Aeneas	Helen, Menelaus, Aeolus, Ulysses	172	509-534	25.58	N13
21	Deiphobe	Aeneas	Pluto	38	539-543	5.83	C36
22	Deiphobus	Deiphobe and Aeneas	NONE	16	544-546	2.58	F4
23	Aeneas	Deiphobe	NONE	14	560-561	2.00	Q14
24	Deiphobe	Aeneas	Hecate, Rhadamanthus, Tisiphone, Hydra, Earth, Titan, Aloeus, Jupiter, Salmoneus, Jupiter, Tityos, Lapith, Ixion, Pirithous,	421	562-627	65.42	N14

			Tantalus, Fury, Theseus, Phlegyas				
25	Phlegyas	NONE	NONE	7	620	1.00	C37
26	Deiphobe	Aeneas	None	27	629-632	3.92	C38
27	Deiphobe	Musaeus	Anchises	20	669-671	3.00	Q15
28	Musaeus	Deiphobe	NONE	28	673-676	4.00	R10
29	Anchises	Aeneas	NONE	55	687-694	8.00	G4
30	Aeneas	Anchises	NONE	26	695-698	3.75	G5
31	Anchises	Aeneas	Fate	35	713-718	5.58	N15
32	Aeneas	Anchises	None	23	719-721	3.00	Q16
33	Anchises	Aeneas	Titan, Sol	187	722-751	**29.67**	N16
34	Anchises	Aeneas	Silvius, Lavinia, Procas, Capys, Numitor, Aeneas Silvius, Mars, romulus, Ilia, Assaracus, Jupiter, Cybele, Caesar, Augustus Caesar, Saturn, Atlas, Hercules, Erymanthus, Lerna, Bacchus, Numa, Tulus, Ancus, Brutus, Torquatus, Camillus, Monoecus, Decii, Drusi, Agamemmnon, Aeacus, Achilles, Minerva, Cato, Cossus, Gracchus, Scipio, Fabricius, Serranus, Fabius, Marcellus, Quirinus	657	756-853 + 855-859	103.00	O13
35	Aeneas	Anchises	NONE	30	863-866	4.00	Q17
36	Anchises	Aeneas	Mars, Tiber, Romulus, Marcellus	124	868-886	18.17	O14

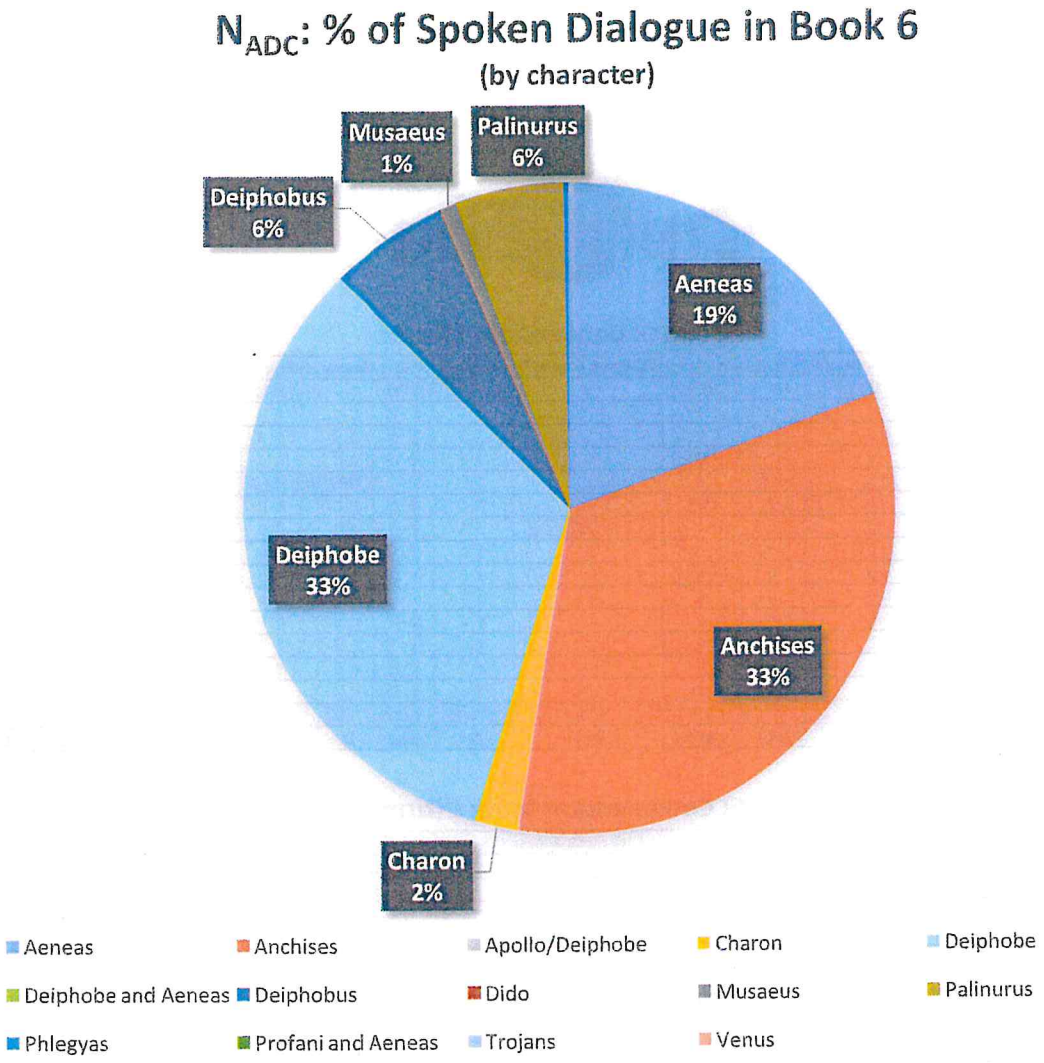


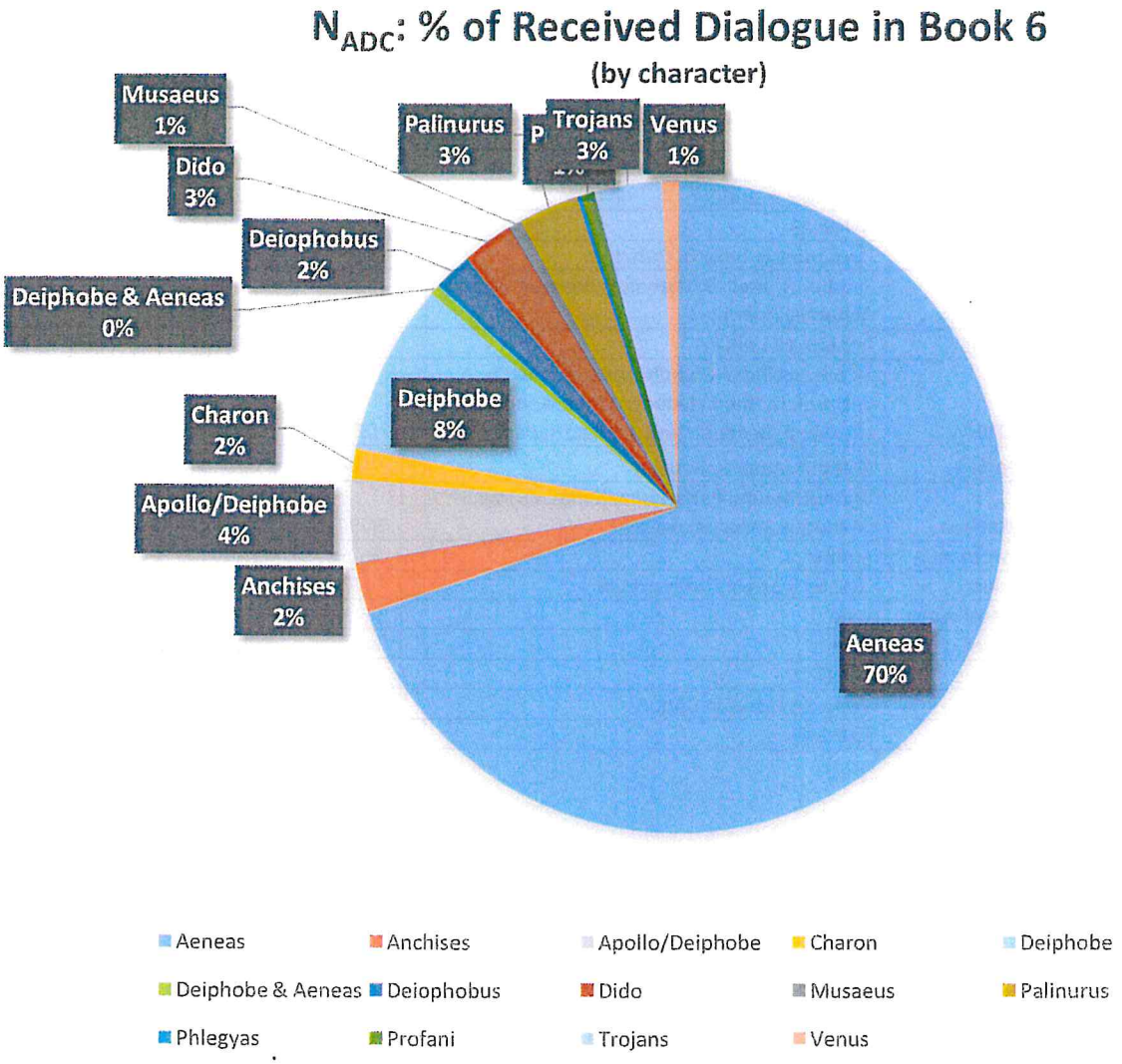
Book 6: Conversation Matrix

CHARACTERS	Aeneas	Anchises	Apollo/Deiphobe	Charon	Deiphobe	Deiphobe & Aeneas	Delophobus	Dido	Musaeus	Palinurus	Phlegyas	Profani	Trojans	Venus	TOTAL	%
Aeneas	23	79	131	0	174	0	61	81	0	38	0	0	0	27	614	19.34
Anchises	1058	0	0	0	0	0	0	0	0	0	0	0	0	0	1058	33.32
Apollo/Deiphobe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Charon	0	0	0	0	68	0	0	0	0	0	0	0	0	0	68	2.14
Deiphobe	790	0	0	49	0	0	0	0	20	56	0	21	105	0	1041	32.79
Deiphobe and Aeneas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Deiphobus	172	0	0	0	0	16	0	0	0	0	0	0	0	0	188	5.92
Dido	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Musaeus	0	0	0	0	28	0	0	0	0	0	0	0	0	0	28	0.88
Palinurus	171	0	0	0	0	0	0	0	0	0	0	0	0	0	171	5.39
Phlegyas	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	0.22
Profani and Aeneas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Venus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
TOTAL	2214	79	131	49	270	16	61	81	20	94	7	21	105	27	3175	100.00
%	69.73	2.49	4.13	1.54	8.50	0.50	1.92	2.55	0.63	2.96	0.22	0.66	3.31	0.85	100.00	

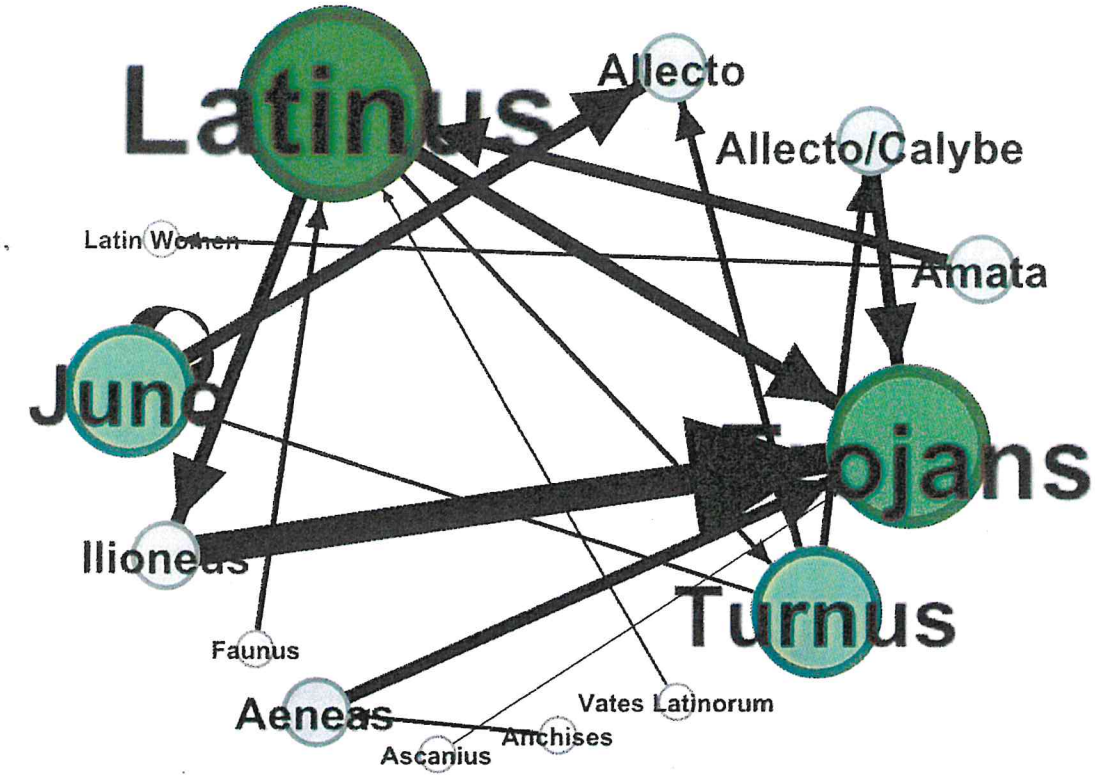
Book 6: Conversation Matrix (Normalized)

CHARACTERS	Aeneas	Anchises	Apollo/Deiphobe	Charon	Deiphobe	Deiphobe & Aeneas	Delophobus	Dido	Musaeus	Palinurus	Phlegyas	Profani	Trojans	Venus	TOTAL
Aeneas	0.72	2.49	4.13	0.00	5.48	0.00	1.92	2.55	0.00	1.20	0.00	0.00	0.00	0.85	19.34
Anchises	33.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.32
Apollo/Deiphobe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Charon	0.00	0.00	0.00	0.00	2.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.14
Deiphobe	24.88	0.00	0.00	1.54	0.00	0.00	0.00	0.00	0.63	1.76	0.00	0.66	3.31	0.00	32.79
Deiphobe and Aeneas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deiphobus	5.42	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.92
Dido	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Musaeus	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88
Palinurus	5.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.39
Phlegyas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.22
Profani and Aeneas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Venus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	69.73	2.49	4.13	1.54	8.50	0.50	1.92	2.55	0.63	2.96	0.22	0.66	3.31	0.85	100.00


N_{ADC}: % of Spoken Dialogue in Book 6
(by character)
Musaeus 1%
Palinurus 6%
Deiphobus 6%
Aeneas 19%
Deiphobe 33%
Anchises 33%
Charon 2%
Aeneas
Anchises
Apollo/Deiphobe
Charon
Deiphobe
Deiphobe and Aeneas
Deiphobus
Dido
Musaeus
Palinurus
Phlegyas
Profani and Aeneas
Trojans
Venus


N_{ADC}: % of Received Dialogue in Book 6
(by character)
Musaeus 1%
Dido 3%
Deiophobus 2%
Deiphobe & Aeneas 0%
Charon 2%
Apollo/Deiphobe 4%
Anchises 2%
Palinurus 3%
Trojans 3%
Venus 1%
Deiphobe 8%
Aeneas 70%
Aeneas
Anchises
Apollo/Deiphobe
Charon
Deiphobe
Deiphobe & Aeneas
Deiophobus
Dido
Musaeus
Palinurus
Phlegyas
Profani
Trojans
Venus

BOOK 7							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Vates Latinorum	Latinus	NONE	14	68-70	2.58	O15
2	Faunus	Latinus	Lavinia	39	96-101	6.00	O16
3	Ascanius	Trojans	NONE	4	116	0.67	N17
4	Aeneas	Trojans	Anchises, Jupiter	97	120-134	14.67	O17
5	Anchises	Aeneas	NONE	25	124-127	4.00	O18
6	Latinus	Trojans	Dardanus, Saturn, Corythus	113	195-211	17.00	Q18
7	Ilioneus	Latinus	Faunus, Jupiter, Dardanus, Aeneas, Apollo, Anchises, Priam	234	213-248	36.00	D3
8	Latinus	Ilioneus	Aeneas, Lavinia	103	259-273	14.58	R11
9	Juno	NONE	Syrtes, Scylla, Charybdis, Mars, Lapith, Calydon, Diana, Calydon, Jupiter, Aeneas, Lavinia, Bellona, Cisseus, Venus, Paris	207	293-322	30.00	S8
10	Juno	Allecto	Night, Aeneas, Latinus	64	331-340	10.00	P25
11	Amata	Latinus	Lavinia, Aquilo, Paris, Leda, Helen, Turnus, Faunus, Inachus, Acrisius	92	359-372	14.00	P26
12	Amata	Latin women	Amata	25	400-403	3.92	C39
13	Allecto/Calybe	Turnus	Latinus, Lavinia, Saturn, Juno	95	421-434	14.00	P27
14	Turnus	Allecto/Calybe	Juno	56	436-444	8.75	R12
15	Allecto	Turnus	Fury	56	452-455	4.00	T3
16	Allecto	Juno	NONE	26	545-551	7.50	P28
17	Juno	Allecto	Venus, Aeneas, Latinus	46	552-560	7.83	R13
18	Latinus	Turnus	NONE	35	594-599	5.58	O19

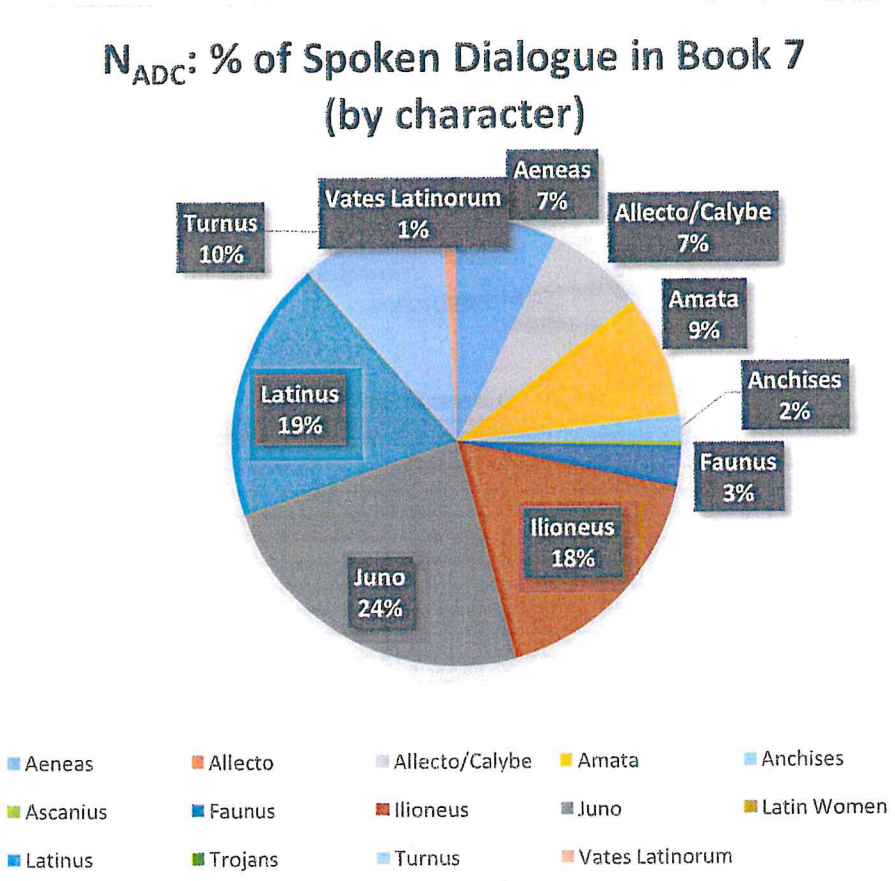


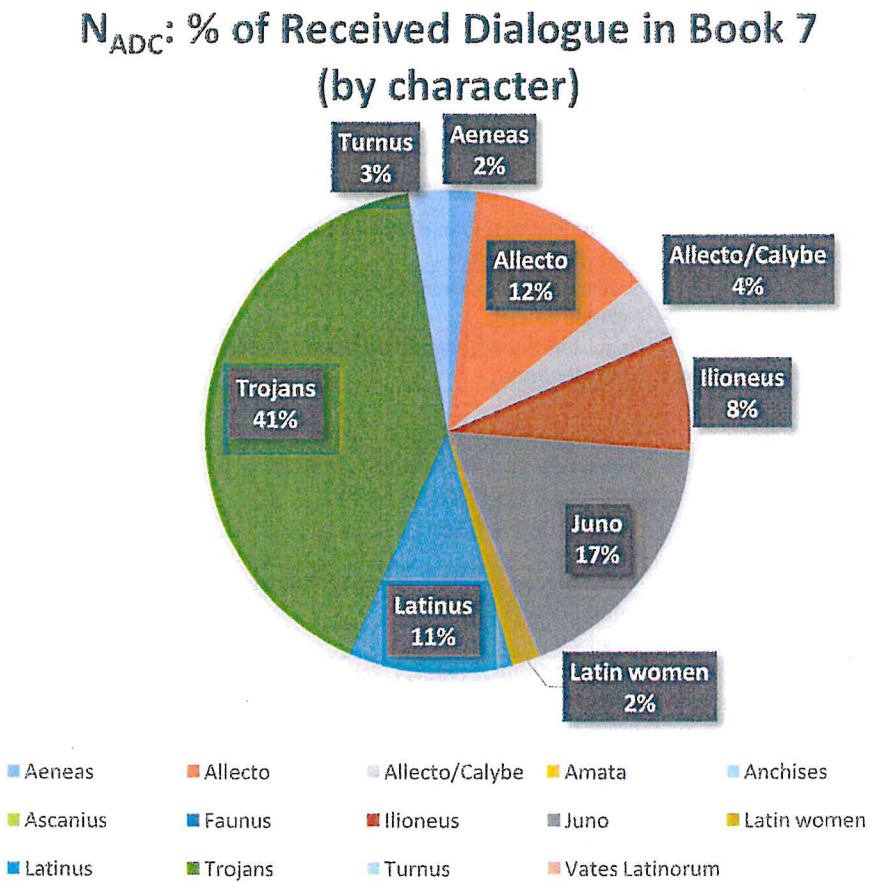
Book 7: Conversation Matrix

CHARACTERS	Aeneas	Allecto	Allecto/Calybe	Amata	Anchises	Ascanius	Faunus	Ilioneus	Juno	Latin women	Latinus	Trojans	Turnus	Vates Latinorum	Total	%
Aeneas	0	0	0	0	0	0	0	0	0	0	0	97	0	0	97	7.29
Allecto	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Allecto/Calybe	0	0	0	0	0	0	0	0	0	0	0	95	0	0	95	7.14
Amata	0	0	0	0	0	0	0	0	0	25	92	0	0	0	117	8.79
Anchises	25	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1.88
Ascanius	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0.30
Faunus	0	0	0	0	0	0	0	0	0	0	39	0	0	0	39	2.93
Ilioneus	0	0	0	0	0	0	0	0	0	0	0	234	0	0	234	17.58
Juno	0	110	0	0	0	0	0	0	207	0	0	0	0	0	317	23.82
Latin Women	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Latinus	0	0	0	0	0	0	0	103	0	0	0	113	35	0	251	18.86
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Turnus	0	56	56	0	0	0	0	0	26	0	0	0	0	0	138	10.37
Vates Latinorum	0	0	0	0	0	0	0	0	0	0	14	0	0	0	14	1.05
TOTAL	25	166	56	0	0	0	0	103	233	25	145	543	35	0	1331	100.00
%	1.88	12.47	4.21	0.00	0.00	0.00	0.00	7.74	17.51	1.88	10.89	40.80	2.63	0.00	100.00	

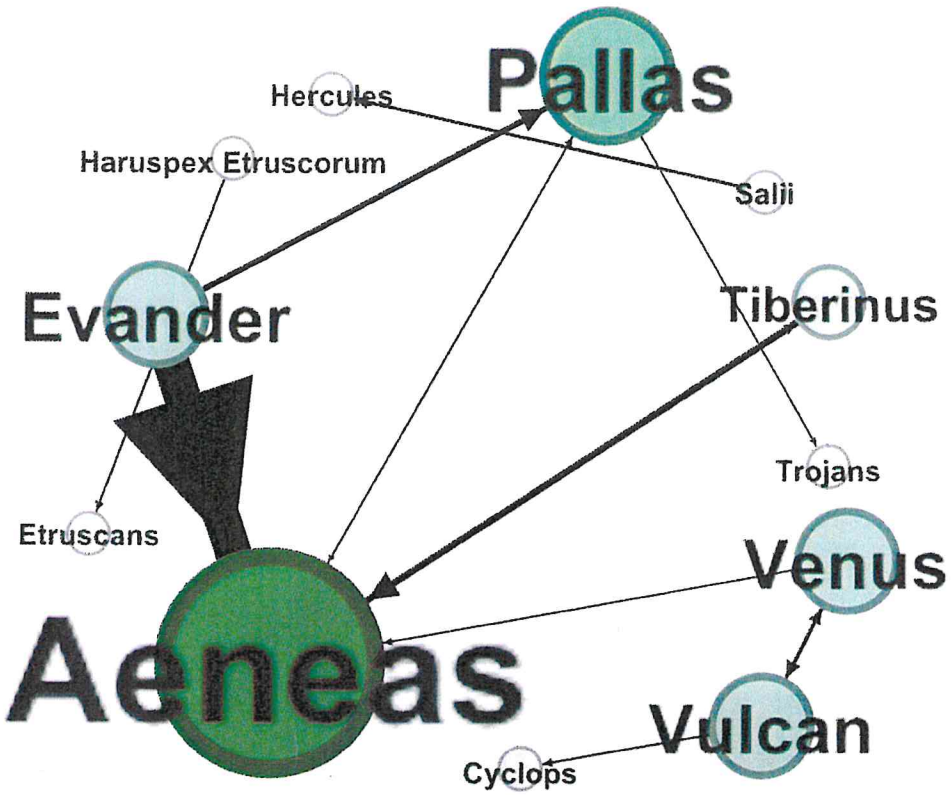
Book 7: Conversation Matrix (Normalized)

CHARACTERS	Aeneas	Allecto	Allecto/Calybe	Amata	Anchises	Ascanius	Faunus	Ilioneus	Juno	Latin women	Latinus	Trojans	Turnus	Vates Latinorum	Total
Aeneas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.29	0.00	0.00	7.29
Allecto	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Allecto/Calybe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	7.14
Amata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88	6.91	0.00	0.00	0.00	8.79
Anchises	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88
Ascanius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.30
Faunus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.93	0.00	0.00	0.00	2.93
Ilioneus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.58	0.00	0.00	17.58
Juno	0.00	8.26	0.00	0.00	0.00	0.00	0.00	0.00	15.55	0.00	0.00	0.00	0.00	0.00	23.82
Latin Women	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Latinus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.74	0.00	0.00	0.00	8.49	2.63	0.00	18.86
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Turnus	0.00	4.21	4.21	0.00	0.00	0.00	0.00	0.00	1.95	0.00	0.00	0.00	0.00	0.00	10.37
Vates Latinorum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.00	0.00	0.00	1.05
TOTAL	1.88	12.47	4.21	0.00	0.00	0.00	0.00	7.74	17.51	1.88	10.89	40.80	2.63	0.00	100.00


N_{ADC}: % of Spoken Dialogue in Book 7 (by character)
Aeneas 7%
Allecto/Calybe 7%
Amata 9%
Anchises 2%
Faunus 3%
Ilioneus 18%
Juno 24%
Latinus 19%
Turnus 10%
Vates Latinorum 1%
Aeneas
Allecto
Allecto/Calybe
Amata
Anchises
Ascanius
Faunus
Ilioneus
Juno
Latin Women
Latinus
Trojans
Turnus
Vates Latinorum


N_{ADC}: % of Received Dialogue in Book 7 (by character)
Turnus 3%
Aeneas 2%
Allecto 12%
Allecto/Calybe 4%
Ilioneus 8%
Trojans 41%
Juno 17%
Latinus 11%
Latin women 2%
Aeneas
Allecto
Allecto/Calybe
Amata
Anchises
Ascanius
Faunus
Ilioneus
Juno
Latin women
Latinus
Trojans
Turnus
Vates Latinorum

BOOK 8							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Tiberinus	Aeneas	Ascanius, Pallas, Evander, Juno	195	36-65 (omit 46)	29.67	O20
2	Aeneas	**Tiberinus** & Nymphs	NONE	53	71-78	8.00	PRA15
3	Pallas	Trojans	NONE	18	112-114	2.42	Q19
4	Aeneas	Pallas	Evander	25	117-120	4.00	C40
5	Pallas	Aeneas	Evander	13	122-123	1.92	C41
6	Aeneas	Evander	Fortune, Atrides, Fate, Dardanus, Electra, Atlas, Mercury, Maia	171	127-151	25.00	D4
7	Evander	Aeneas	Anchises, Priam, Laomedon, Laomedon, Pallas,	129	154-174	20.58	R14
8	Evander	Aeneas and Trojans	Cacus, Vulcan, Geryon, Amphitryon, Alcides, Eurus, Potitius	553	185-275	90.58	N18
9	Salii	Hercules	Hylaeus, Pholus, Typhoeus, Jupiter	66	293-302	9.75	PRA16
10	Evander	Aeneas	Fauns,nymphs, Saturn, Jupiter, Tiber, Fortune, Fate, Carmentis, Apollo	151	314-336	23.00	N19
11	Evander	Aeneas	Jupiter, Janus, Saturn	50	351-358	7.83	N20
12	Evander	Aeneas	Alcides	24	362-365	3.42	P29
13	Venus	Vulcan	Priam, Aeneas, Jupiter, Nereus, Tithonus	83	374-386	13.00	P30
14	Vulcan	Venus	Jupiter, Jfate, Priam	68	395-404	9.58	R15
15	Vulcan	Cyclops	Aeneas	28	439-443	4.25	C42
16	Evander	Aeneas	Fate, Mezentius, Turnus, Tarchon, Pallas, Fate	322	470-519	50.00	N21
17	Haruspex Etruscorum	Etruscans	Mezentius	28	499-530	4.33	O21
18	Aeneas	Evander	Venus, Vulcan, Turnus, Tiber	57	532-540	8.75	O22
19	Evander	Pallas	Jupiter, Erulus, Feronia, Mezentius, Pallas, Fortune	159	560-583	23.17	F5
20	Venus	Aeneas	Vulcan, Turnus	20	612-614	3.00	P31

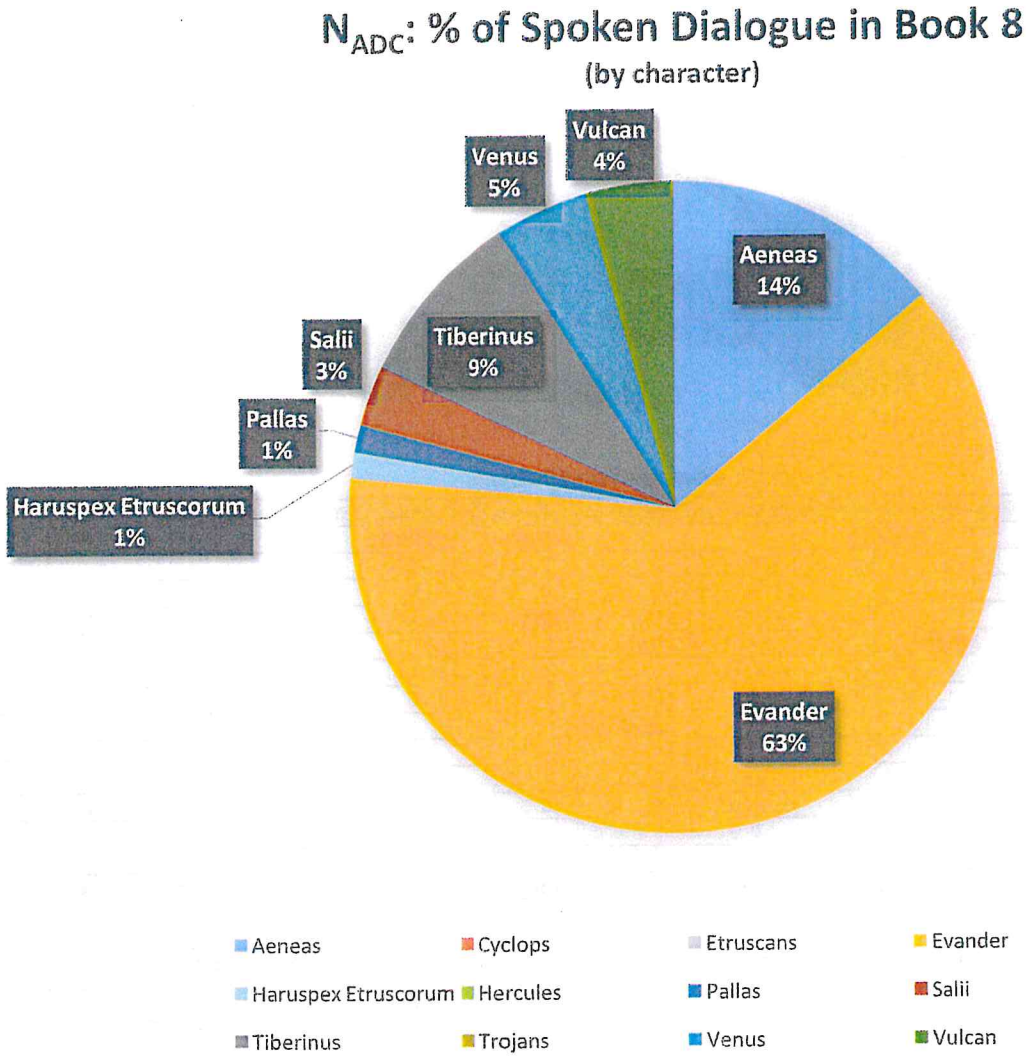


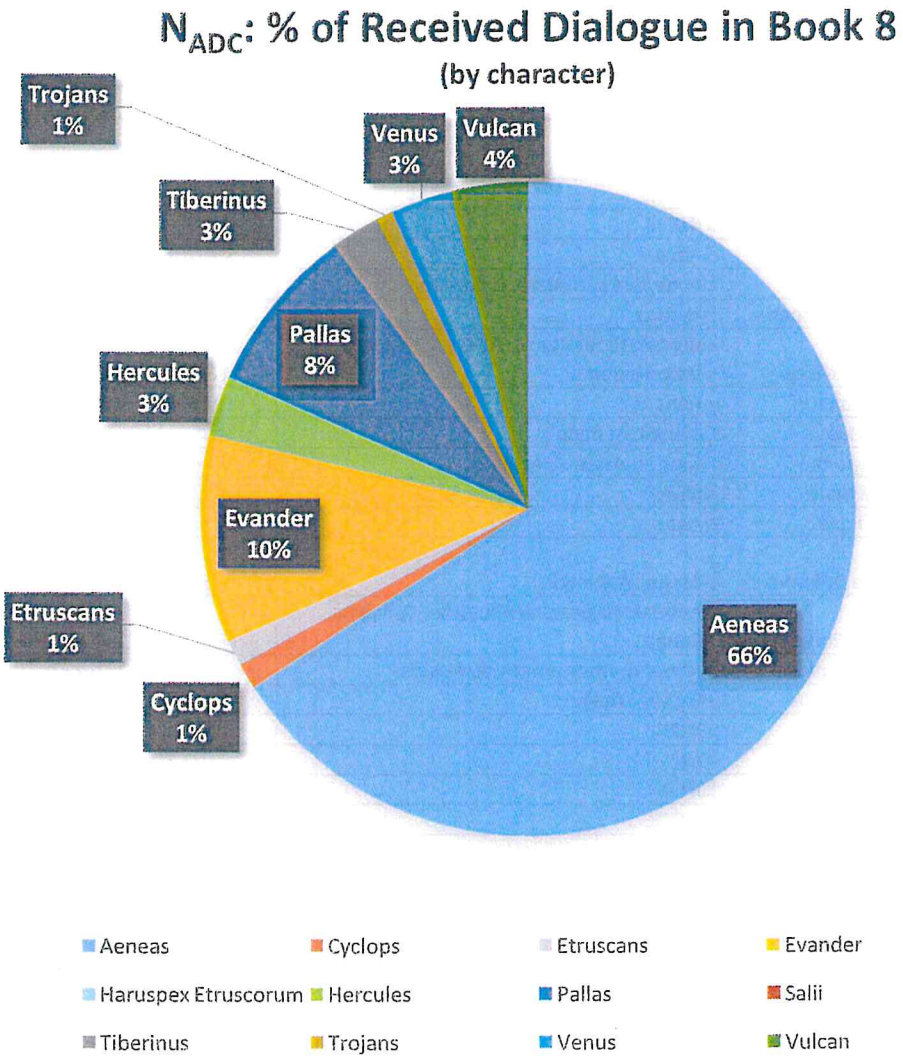
Book 8: Conversation Matrix

CHARACTERS	Aeneas	Cyclops	Etruscans	Evander	Haruspex Etruscorum	Hercules	Pallas	Salii	Tiberinus	Trojans	Venus	Vulcan	TOTAL	%
Aeneas	0	0	0	228	0	0	25	0	53	0	0	0	306	13.83
Cyclops	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Etruscans	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Evander	1229	0	0	0	0	0	159	0	0	0	0	0	1388	62.72
Haruspex Etruscorum	0	0	28	0	0	0	0	0	0	0	0	0	28	1.27
Hercules	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Pallas	13	0	0	0	0	0	0	0	0	18	0	0	31	1.40
Salii	0	0	0	0	0	66	0	0	0	0	0	0	66	2.98
Tiberinus	195	0	0	0	0	0	0	0	0	0	0	0	195	8.81
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Venus	20	0	0	0	0	0	0	0	0	0	0	83	103	4.65
Vulcan	0	28	0	0	0	0	0	0	0	0	68	0	96	4.34
TOTAL	1457	28	28	228	0	66	184		53	18	68	83	2213	100.00
%	65.84	1.27	1.27	10.30	0.00	2.98	8.31	0.00	2.39	0.81	3.07	3.75	100.00	

Book 8: Conversation Matrix (Normalized)

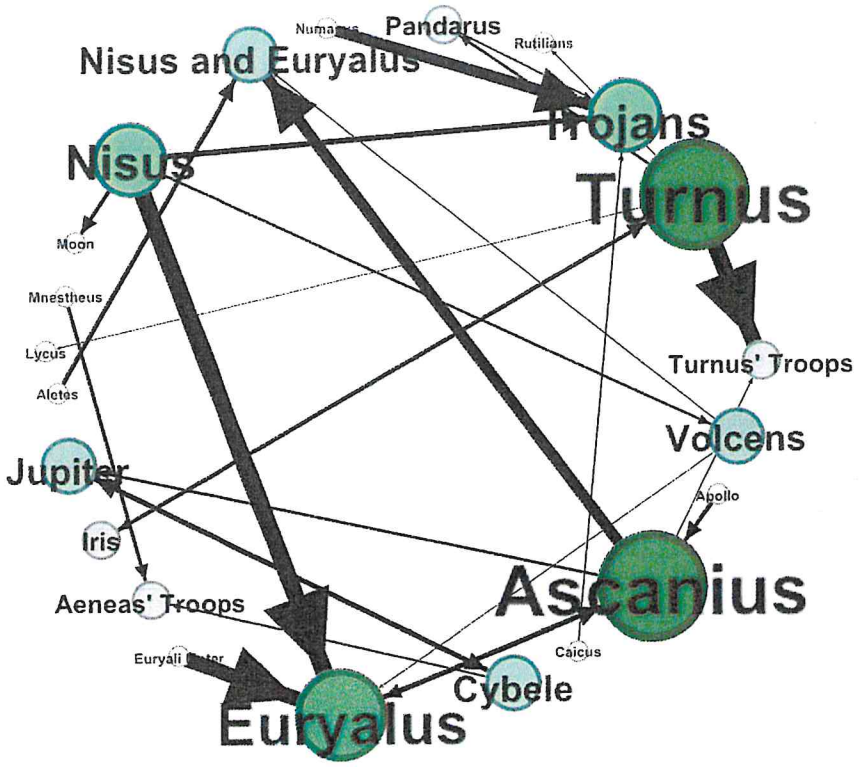
CHARACTERS	Aeneas	Cyclops	Etruscans	Evander	Haruspex Etruscorum	Hercules	Pallas	Salii	Tiberinus	Trojans	Venus	Vulcan	TOTAL
Aeneas	0.00	0.00	0.00	10.30	0.00	0.00	1.13	0.00	2.39	0.00	0.00	0.00	13.83
Cyclops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Etruscans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Evander	55.54	0.00	0.00	0.00	0.00	0.00	7.18	0.00	0.00	0.00	0.00	0.00	62.72
Haruspex Etruscorum	0.00	0.00	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27
Hercules	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pallas	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	1.40
Salii	0.00	0.00	0.00	0.00	0.00	2.98	0.00	0.00	0.00	0.00	0.00	0.00	2.98
Tiberinus	8.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.81
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Venus	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	4.65
Vulcan	0.00	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.07	0.00	4.34
TOTAL	65.84	1.27	1.27	10.30	0.00	2.98	8.31	0.00	2.39	0.81	3.07	3.75	100.00


N_{ADC}: % of Spoken Dialogue in Book 8
(by character)
Vulcan 4%
Venus 5%
Aeneas 14%
Salii 3%
Tiberinus 9%
Pallas 1%
Haruspex Etruscorum 1%
Evander 63%
Aeneas
Cyclops
Etruscans
Evander
Haruspex Etruscorum
Hercules
Pallas
Salii
Tiberinus
Trojans
Venus
Vulcan


N_{ADC}: % of Received Dialogue in Book 8
(by character)
Trojans 1%
Venus 3%
Vulcan 4%
Tiberinus 3%
Pallas 8%
Hercules 3%
Evander 10%
Etruscans 1%
Cyclops 1%
Aeneas 66%
Aeneas
Cyclops
Etruscans
Evander
Haruspex Etruscorum
Hercules
Pallas
Salii
Tiberinus
Trojans
Venus
Vulcan

BOOK 9							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Iris	Turnus	Aeneas, Evander	51	6-13	8.00	C43
2	Turnus	Iris	NONE	31	18-22	4.42	PRA17
3	Caicus	Trojans	NONE	17	36-38	2.42	C44
4	Turnus	Rutilians	NONE	10	51-52	1.08	C45
5	Cybele	Jupiter	Aeneas	66	83-92	9.42	P32
6	Jupiter	Cybele	Aeneas, Doto, Nereus, Galatea	59	94-13	10.00	R16
7	Cybele	Aeneas' Troops	Turnus	25	114-117	3.67	C46
8	Turnus	Turnus' Troops	Jupiter, Fate, Venus, Atrides, Neptune, Vulcan, Hector	216	128-158	31.00	E3
9	Nisus	Euryalus	Aeneas	88	184-196	12.75	P33
10	Euryalus	Nisus	Opheltes, Aeneas	54	199-206	8.00	R17
11	Nisus	Euryalus	Jupiter, mother, Acestes	86	207-218	11.75	P34
12	Euryalus	Nisus	NONE	12	219-221	2.00	R18
13	Nisus	Trojans	Aeneas	72	234-245	11.58	P35
14	Aletes	Nisus and Euryalus	Ascanius, Aeneas	56	247-250 + 252-256	8.17	R19
15	Ascanius	Nisus and Euryalus	Aeneas, Assaracus, Vesta, Dido, Turnus, Latinus	152	257-280	23.00	R20
16	Euryalus	Ascanius	Fortune, mother, Priam, Acestes	79	281-292	11.17	P36
17	Ascanius	Euryalus	Creusa, Aeneas	46	296-302	7.00	R21
18	Nisus	Euryalus	NONE	34	320-323	4.00	C47
19	Nisus	Euryalus	NONE	14	355-356	1.92	C48
20	Volcens	Nisus and Euryalus	NONE	12	376-377	1.42	C49
21	Nisus	Euryalus	NONE	8	390-391	1.25	A4
22	Nisus	Moon	Latona, Hyrtacus, Euryalus	47	404-409	6.00	PRA18
23	Volcens	Euryalus	NONE	9	422-423	1.42	T4
24	Nisus	Volcens	Euryalus	31	427-430	4.00	P37
25	Euryalus Mater	Euryalus	Jupiter	121	481-497	17.00	A5
26	Turnus	Lycus	NONE	7	560-561	1.17	T5

27	Numanus	Trojans	Atrides, Ulysses	150	598-620	23.00	V1
28	Ascanius	Jupiter	NONE	34	625-629	5.00	PRA19
29	Ascanius	Turnus' Troops	NONE	12	634-635	1.83	T6
30	Apollo	Iulus	Assaracus	26	641-644	3.42	O23
31	Apollo	Iulus	Aeneas, Numanus, Apollo	24	653-656	3.58	C50
32	Pandarus	Trojans	Amata, Turnus	19	737-739	2.75	T7
33	Turnus	Pandarus	Priam, Achilles	14	741-742	2.00	T8
34	Turnus	Pandarus	NONE	17	747-748	2.00	T9
35	Mnestheus	Aeneas' Troops	Aeneas	43	781-787	6.58	E4

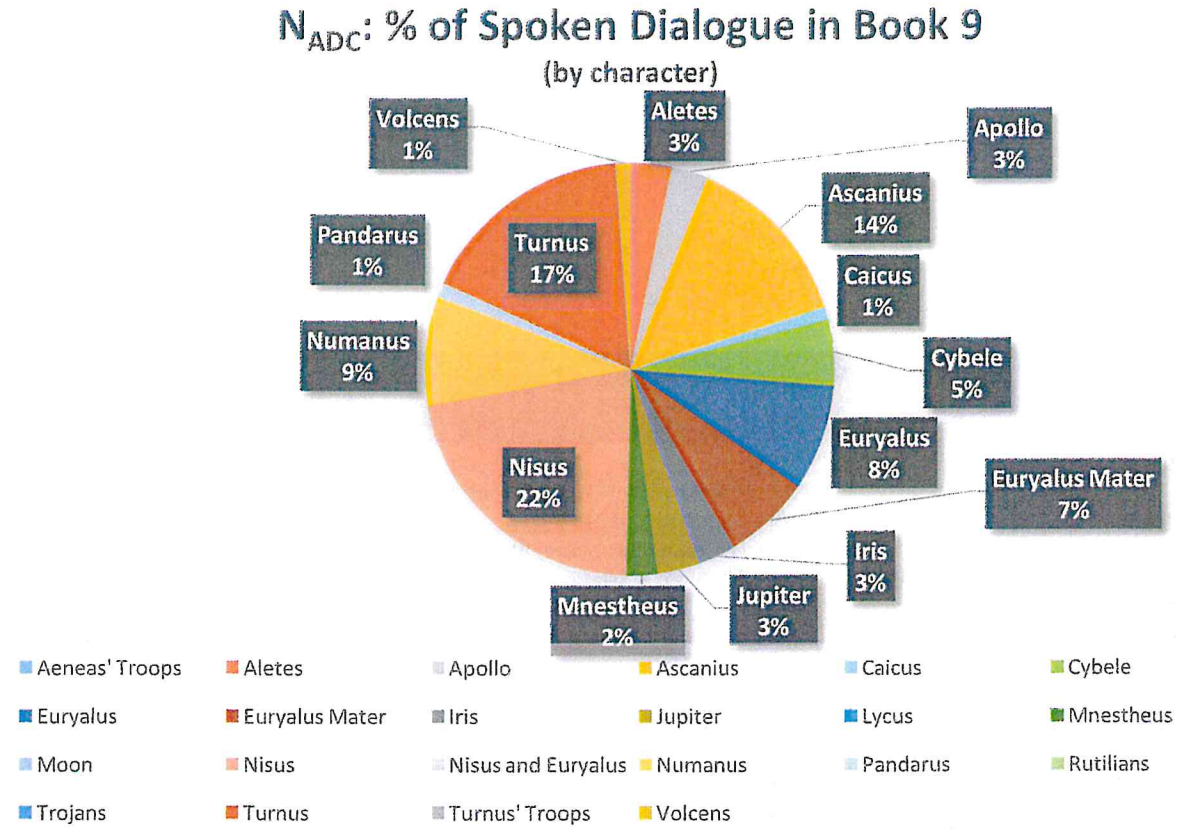


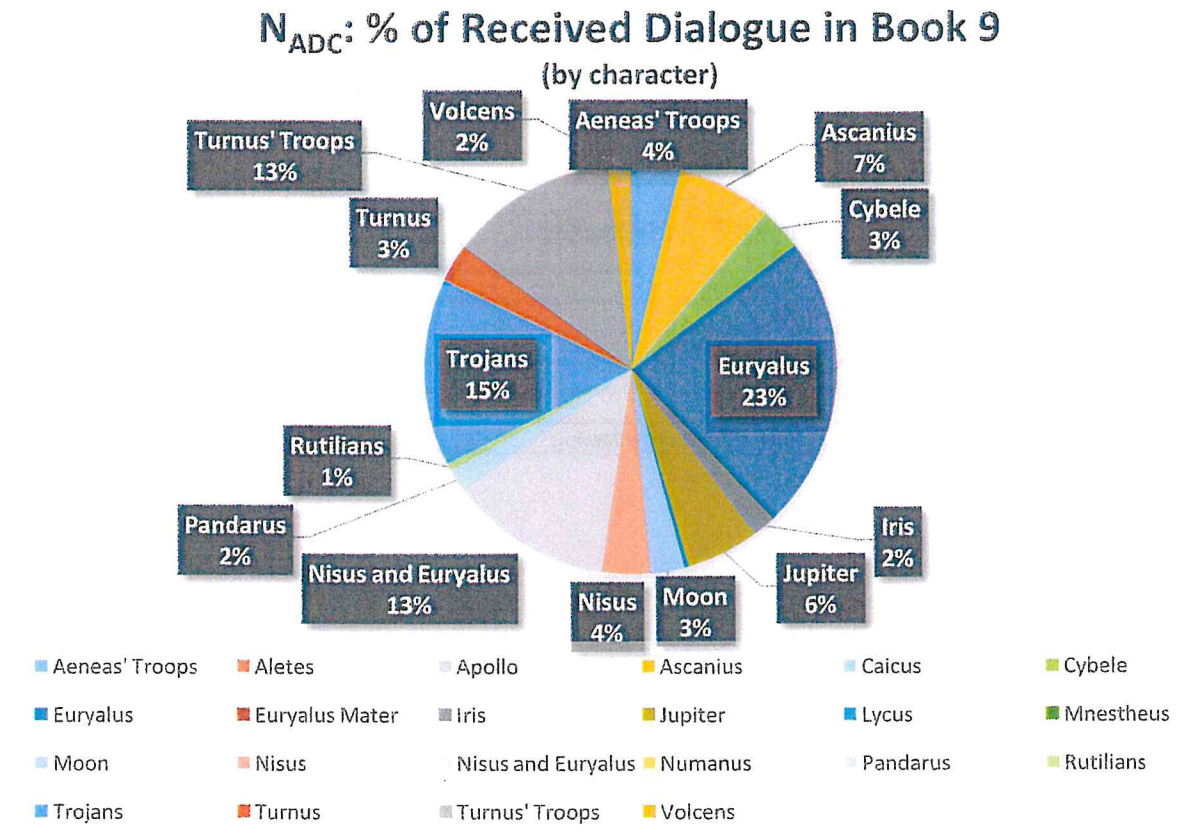
Book 9: Conversation Matrix

CHARACTERS	Aeneas' Troops	Aletes	Apollo	Ascanius	Caicus	Cybele	Euryalus	Euryali Mater	Iris	Jupiter	Lycus	Mnestheus	Moon	Nisus	Nisus and Euryalus	Numanus	Pandarus	Rutilians	Trojans	Turnus	Turnus' Troops	Volcens	TOTAL
Aeneas' Troops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aletes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	0	0	0	0	0	0	0	56
Apollo	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
Ascanius	0	0	0	0	0	0	46	0	0	34	0	0	0	0	152	0	0	0	0	0	12	0	244
Caicus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	17
Cybele	25	0	0	0	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0	0	0	0	91
Euryalus	0	0	0	79	0	0	0	0	0	0	0	0	0	66	0	0	0	0	0	0	0	0	145
Euryali Mater	0	0	0	0	0	0	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121
Iris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	0	0	51
Jupiter	0	0	0	0	0	59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
Lycus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mnestheus	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43
Moon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nisus	0	0	0	0	0	0	230	0	0	0	0	0	47	0	0	0	0	0	72	0	0	31	380
Nisus and Euryalus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Numanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	0	0	0	150
Pandarus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	19
Rutilians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnus	0	0	0	0	0	0	0	0	31	0	7	0	0	0	0	0	31	10	0	0	216	0	295
Turnus' Troops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Volcens	0	0	0	0	0	0	9	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	21
TOTAL	68	0	0	129	0	59	406	0	31	100	7	0	47	66	220	0	31	10	258	51	228	31	1742

Book 9: Conversation Matrix (Normalized)

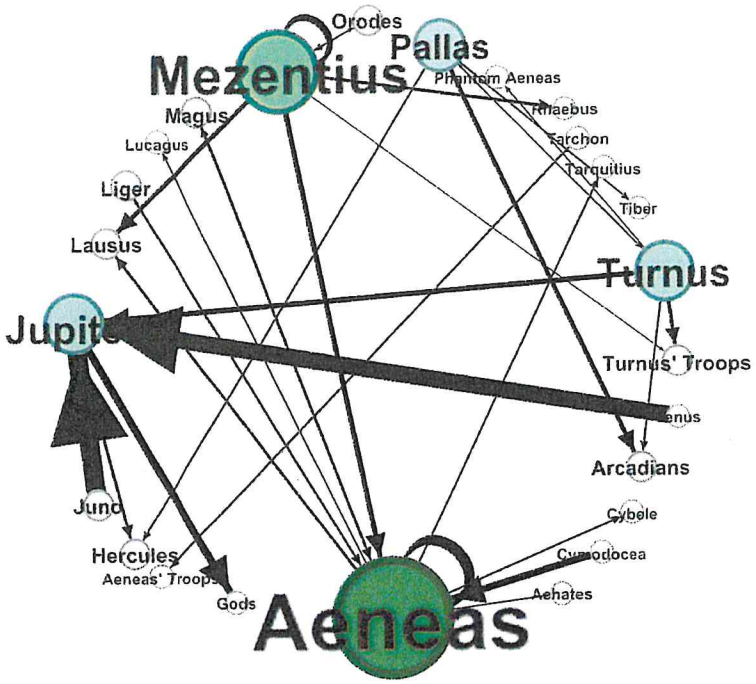
CHARACTERS	Aeneas' Troops	Aletes	Apollo	Ascanius	Caicus	Cybele	Euryalus	Euryali Mater	Iris	Jupiter	Lycus	Mnestheus	Moon	Nisus	Nisus and Euryalus	Numanus	Pandarus	Rutilians	Trojans	Turnus	Turnus' Troops	Volcens	TOTAL
Aeneas' Troops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aletes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.21
Apollo	0.00	0.00	0.00	2.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.87
Ascanius	0.00	0.00	0.00	0.00	0.00	0.00	2.64	0.00	0.00	1.95	0.00	0.00	0.00	0.00	8.73	0.00	0.00	0.00	0.00	0.00	0.69	0.00	14.01
Caicus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.98
Cybele	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.22
Euryalus	0.00	0.00	0.00	4.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.32
Euryali Mater	0.00	0.00	0.00	0.00	0.00	0.00	6.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.95
Iris	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.93	0.00	0.00	0.00	2.93
Jupiter	0.00	0.00	0.00	0.00	0.00	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39
Lycus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mnestheus	2.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.47
Moon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nisus	0.00	0.00	0.00	0.00	0.00	0.00	13.20	0.00	0.00	0.00	0.00	0.00	2.70	0.00	0.00	0.00	0.00	0.00	4.13	0.00	0.00	1.78	21.81
Nisus and Euryalus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Numanus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.61	0.00	0.00	0.00	8.61
Pandarus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	1.09
Rutilians	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Turnus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.00	0.40	0.00	0.00	0.00	0.00	0.00	1.78	0.57	0.00	0.00	12.40	0.00	16.93
Turnus' Troops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volcens	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21
TOTAL	3.90	0.00	0.00	7.41	0.00	3.39	23.31	0.00	1.78	5.74	0.40	0.00	2.70	3.79	12.63	0.00	1.78	0.57	14.81	2.93	13.09	1.78	100.00


N_{ADC}: % of Spoken Dialogue in Book 9
(by character)
Volcens 1%
Aletes 3%
Apollo 3%
Ascanius 14%
Pandarus 1%
Turnus 17%
Caicus 1%
Numanus 9%
Cybele 5%
Euryalus 8%
Nisus 22%
Euryalus Mater 7%
Iris 3%
Mnestheus 2%
Jupiter 3%
Aeneas' Troops
Aletes
Apollo
Ascanius
Caicus
Cybele
Euryalus
Euryalus Mater
Iris
Jupiter
Lycus
Mnestheus
Moon
Nisus
Nisus and Euryalus
Numanus
Pandarus
Rutilians
Trojans
Turnus
Turnus' Troops
Volcens


N_{ADC}: % of Received Dialogue in Book 9
(by character)
Volcens 2%
Aeneas' Troops 4%
Turnus' Troops 13%
Ascanius 7%
Turnus 3%
Cybele 3%
Trojans 15%
Euryalus 23%
Rutilians 1%
Pandarus 2%
Iris 2%
Nisus and Euryalus 13%
Jupiter 6%
Nisus 4%
Moon 3%
Aeneas' Troops
Aletes
Apollo
Ascanius
Caicus
Cybele
Euryalus
Euryalus Mater
Iris
Jupiter
Lycus
Mnestheus
Moon
Nisus
Nisus and Euryalus
Numanus
Pandarus
Rutilians
Trojans
Turnus
Turnus' Troops
Volcens

BOOK 10							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Jupiter	Gods	NONE	63	6-15	10.00	C51
2	Venus	Jupiter	Turnus, Aeneas, Tydeus, Diomedes, Aeolus, Iris, Allecto, Fortune, Ascanius	290	18-62	44.58	D5
3	Juno	Jupiter & Gods	Aeneas, Latinus, Cassandra, Juno, Iris, Turnus, Pilumnus, Venilia	229	36-95	32.58	L2
4	Jupiter	Gods	NONE	63	104-113	9.42	C52
5	Cymodocea	Aeneas	Turnus, Cybele, Ascanius, Vulcan	119	228-245	17.42	N22
6	Aeneas	Cybele		27	252-255	17.42	PRA20
7	Turnus	Rutilians and Latins	Mars, Fortune	37	279-284	4.00	35
8	Tarchon	"His" crew	NONE	29	294-298	6.00	C53
9	Aeneas	Achates	NONE	17	333-335	4.58	C54
10	Pallas	Arcadians	Evander	71	369-378	20.42	E6
11	Pallas	Tiber	Halaesus	22	421-423	10.00	PRA21
12	Turnus	Rutilians and Latins	Pallas	17	441-443	3.00	C55
13	Pallas	Turnus	Evander	17	449-451	2.58	T10
14	Pallas	Alcides	Alcides, Turnus	26	460-463	4.00	PRA22
15	Jupiter	Hercules	Sarpedon, Turnus	42	467-472	6.00	P38
16	Turnus	Pallas	NONE	7	481	1.00	T111
17	Turnus	Arcadians	Evander, Pallas, Aeneas	26	491-495	4.08	T12
18	Magus	Aeneas	Anchises, Iulus	40	524-529	6.00	P39
19	Aeneas	Magus	Turnus, Pallas, Anchises, Iulus	27	531-534	4.00	R22
20	Aeneas	Tarquitius	NONE	26	557-560	4.00	T13
21	Liger	Aeneas	Diomedes, Achilles	18	581-583	2.42	T14
22	Aeneas	Lucagus	NONE	19	592-594	2.67	T15
23	Liger	Aeneas	Anchises, Venus	16	597-598	2.00	P40
24	Aeneas	Liger	NONE	11	599-600	1.42	T16
25	Jupiter	Juno	Venus	26	60-610	4.00	T17
26	Juno	Jupiter	Turnus, Daunus, Pilumnus	69	611-620	9.58	P41

27	Jupiter	Juno	Turnus	**39**	622-627	6.00	R23
28	Juno	Jupiter	Turnus	**38**	628-632	4.58	P42
29	Turnus	Phantom Aeneas	Lavinia	**14**	649-650	2.00	T18
30	Turnus	Jupiter (Winds)	Rumor	**87**	668-679	12.00	A6
31	Mezentius	Rutilians and Latins--Turnus'Troops	Orodes	**8**	737	10.00	T19
32	Orodes	Mezentius	NONE	**22**	739-741	2.58	O24
33	Mezentius	Orodes	Jupiter	**11**	743-744	1.17	T20
34	Mezentius	NONE	Lausus	**21**	773-776	3.25	PRA23
35	Aeneas	Mezentius	NONE	**11**	811-812	1.67	T21
36	Aeneas	Lausus	NONE	**41**	825-830	5.67	A7
37	Mezentius	Lausus	NONE	**69**	846-856	10.25	A8
38	Mezentius	Rhaebus, horse	Aeneas, Lausus	**44**	861-866	6.00	A9
39	Aeneas	Aeneas	Apollo	**11**	875-876	2.00	T22
40	Mezentius	Aeneas	Lausus	**30**	878-882	4.00	T23
41	Aeneas	Mezentius	NONE	**9**	897-898	1.17	T24
42	Mezentius	Aeneas	Lausus	**52**	900-906	7.00	P43

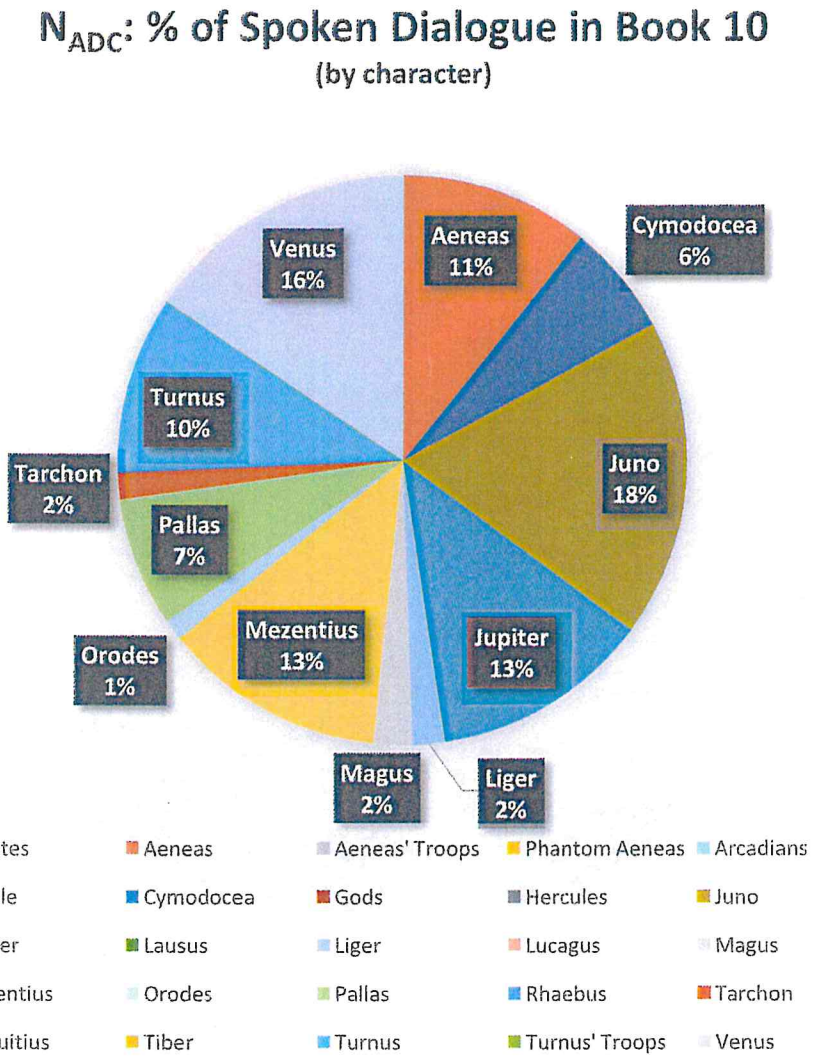


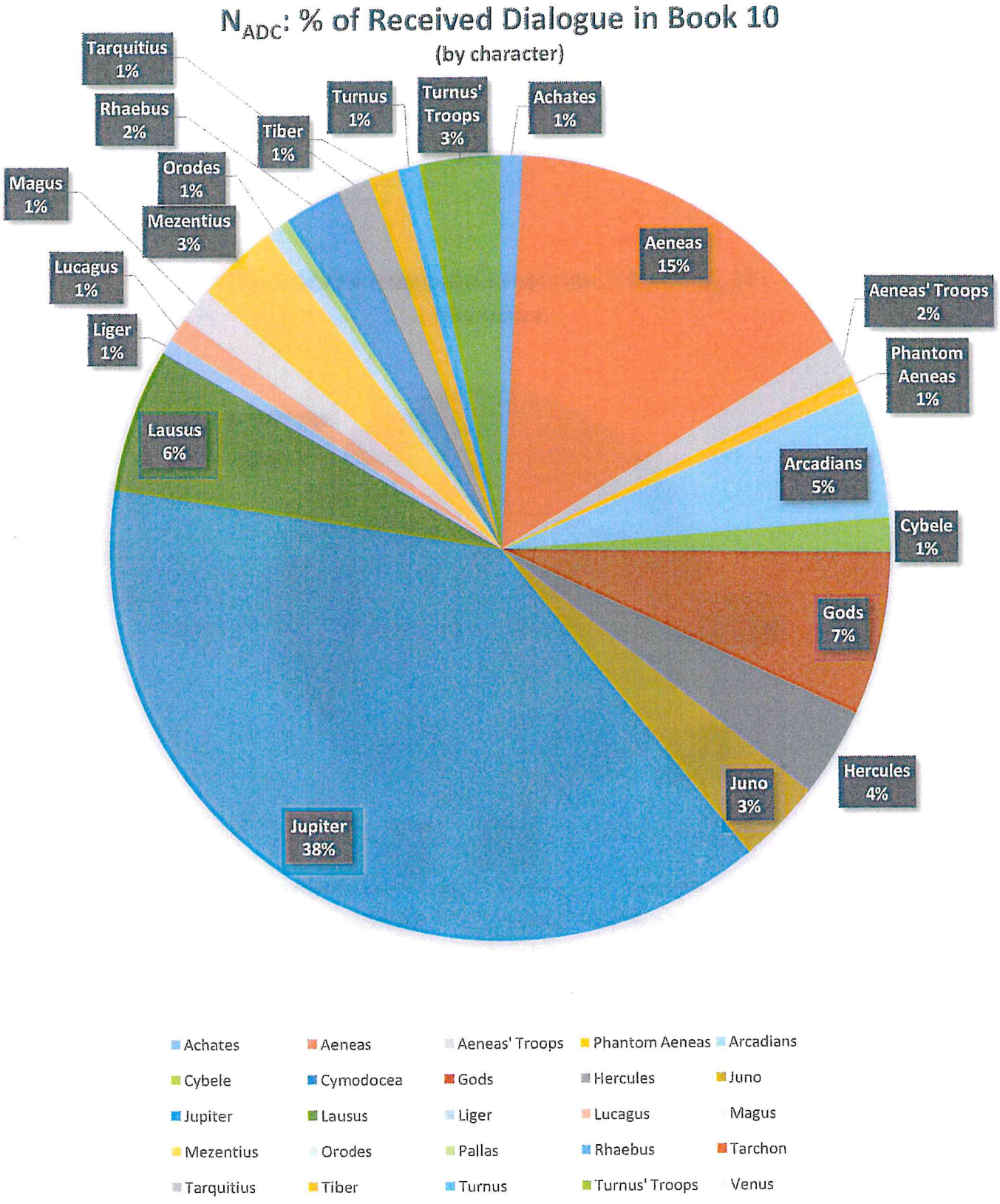
Book 10: Conversation Matrix

CHARACTERS	Achates	Aeneas	Aeneas' Troops	Phantom Aeneas	Arcadians	Cybele	Cymodocea	Gods	Hercules	Juno	Jupiter	Lausus	Liger	Lucagus	Magus	Mezentius	Orodes	Pallas	Rhaebus	Tarchon	Tarquitius	Tiber	Turnus	Turnus' Troops	Venus	TOTAL	%
Achates	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Aeneas	17	11	0	0	0	27	0	0	0	0	0	41	11	19	27	20	0	0	0	0	26	0	0	0	0	199	10.69
Aeneas' Troops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Phantom Aeneas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Arcadians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Cybele	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Cymodocea	0	119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	119	6.39
Gods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Hercules	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Juno	0	0	0	0	0	0	0	0	0	0	336	0	0	0	0	0	0	0	0	0	0	0	0	0	0	336	18.05
Jupiter	0	0	0	0	0	0	0	126	42	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	233	12.52
Lausus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Liger	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	1.83
Lucagus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Magus	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	2.15
Mezentius	0	82	0	0	0	0	0	0	0	0	69	0	0	0	0	21	11	0	44	0	0	0	8	0	0	235	12.63
Orodes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	0	0	0	22	1.18
Pallas	0	0	0	0	71	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	22	17	0	136	7.31
Rhaebus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Tarchon	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	1.56
Tarquitius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Tiber	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Turnus	0	0	0	14	26	0	0	0	0	0	87	0	0	0	0	0	0	7	0	0	0	0	54	0	0	188	10.10
Turnus' Troops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Venus	0	0	0	0	0	0	0	0	0	0	290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	290	15.58
TOTAL	17	286	29	14	97	27	0	126	68	65	713	110	11	19	27	63	11	7	44	0	26	22	17	62	0	1861	100.00
%	0.91	15.37	1.56	0.75	5.21	1.45	0.00	6.77	3.65	3.49	38.31	5.91	0.59	1.02	1.45	3.39	0.59	0.38	2.36	0.00	1.40	1.18	0.91	3.33	0.00	100.00	

Book 10: Conversation Matrix (Noramlized)

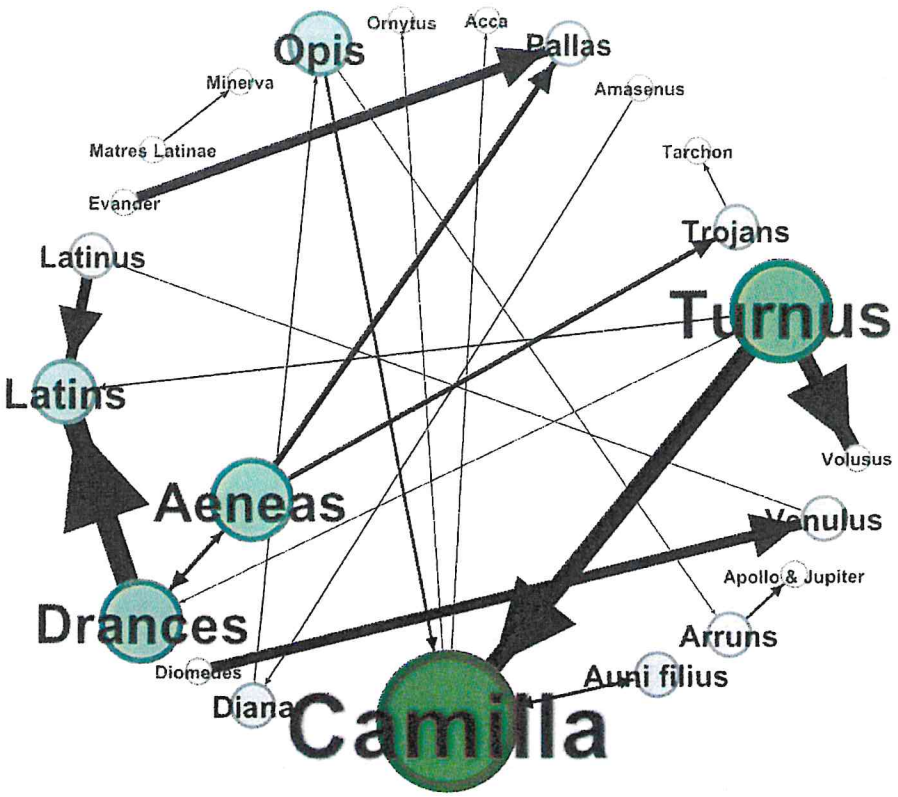
CHARACTERS	Achates	Aeneas	Aeneas' Troops	Phantom Aeneas	Arcadians	Cybele	Cymodocea	Gods	Hercules	Juno	Jupiter	Lausus	Liger	Lucagus	Magus	Mezentius	Orodes	Pallas	Rhaebus	Tarchon	Tarquitius	Tiber	Turnus	Turnus' Troops	Venus	TOTAL
Achates	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aeneas	0.91	0.59	0.00	0.00	0.00	1.45	0.00	0.00	0.00	0.00	0.00	2.20	0.59	1.02	1.45	1.07	0.00	0.00	0.00	0.00	1.40	0.00	0.00	0.00	0.00	10.69
Aeneas' Troops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phantom Aeneas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arcadiant	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cybele	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymodocea	0.00	6.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.39
Gods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hercules	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Juno	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.05
Jupiter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.77	2.26	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.52
Lausus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Liger	0.00	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83
Lucagus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magus	0.00	2.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.15
Mezentius	0.00	4.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.71	0.00	0.00	0.00	1.13	0.59	0.00	2.36	0.00	0.00	0.00	0.00	0.43	0.00	12.63
Orodes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18
Pallas	0.00	0.00	0.00	0.00	3.82	0.00	0.00	0.00	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	7.31
Rhaebus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tarchon	0.00	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56
Tarquitius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tiber	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Turnus	0.00	0.00	0.00	0.75	1.40	0.00	0.00	0.00	0.00	0.00	4.67	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	2.90	0.00	10.10
Turnus' Troops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Venus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.58
	0.91	15.37	1.56	0.75	5.21	1.45	0.00	6.77	3.65	3.49	38.31	5.91	0.59	1.02	1.45	3.39	0.59	0.38	2.36	0.00	1.40	1.18	0.91	3.33	0.00	100.00


N_{ADC}: % of Spoken Dialogue in Book 10
(by character)
Aeneas 11%
Cymodocea 6%
Juno 18%
Jupiter 13%
Liger 2%
Magus 2%
Mezentius 13%
Orodes 1%
Pallas 7%
Tarchon 2%
Turnus 10%
Venus 16%
Achates
Aeneas
Aeneas' Troops
Phantom Aeneas
Arcadians
Cybele
Cymodocea
Gods
Hercules
Juno
Jupiter
Lausus
Liger
Lucagus
Magus
Mezentius
Orodes
Pallas
Rhaebus
Tarchon
Tarquitius
Tiber
Turnus
Turnus' Troops
Venus


N_{ADC}: % of Received Dialogue in Book 10
(by character)
Tarquitius 1%
Rhaebus 2%
Tiber 1%
Turnus 1%
Turnus' Troops 3%
Achates 1%
Orodes 1%
Magus 1%
Mezentius 3%
Aeneas 15%
Aeneas' Troops 2%
Lucagus 1%
Liger 1%
Phantom Aeneas 1%
Lausus 6%
Arcadians 5%
Cybele 1%
Gods 7%
Hercules 4%
Juno 3%
Jupiter 38%
Achates
Aeneas
Aeneas' Troops
Phantom Aeneas
Arcadians
Cybele
Cymodocea
Gods
Hercules
Juno
Jupiter
Lausus
Liger
Lucagus
Magus
Mezentius
Orodes
Pallas
Rhaebus
Tarchon
Tarquitius
Tiber
Turnus
Turnus' Troops
Venus

BOOK 11							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Aeneas	Trojans (officers)	Mezentius, Evander, Pallas	99	14-28	14.92	C56
2	Aeneas	Pallas	Fortune, Evander, Iulus	111	42-58	16.83	A10
3	Aeneas	Pallas	NONE	17	96-98	2.42	F6
4	Aeneas	Drances	Turnus	82	108-119	12.00	R24
5	Drances	Aeneas	Latinus, Tunus	50	124-131	7.75	R25
6	Evander	Pallas	Mars, Pallas, Aeneas, Turnus	211	152-181	30.00	A11
7	Venulus	**Latinus and** Latins	Diomedes, Saturn, Priam, Minerva, Menelaus, Atreus, Ulysses, Diomedes, Neoptolemus, Idomeneus, Venus, Teucer, Aeneas, Hector	332	243-295	53.00	N23
8	Diomedes	Venulus	Saturn, Priam, Minerva, Menelaus, Atreus, Ulysses, Neoptolemus, Idomeneus, Venus, Teucer, Aeneas, Hector	223	252-293	42.00	D6
9	Latinus	Latins	NONE	223	302-335	34.00	D7
10	Drances	Latins and Latinus	Dardanus, Lavinia, Aeneas, Turnus	455	343-375	33.00	D8
11	Turnus	**Drances** & Latinus	Evander, Bitias, Pandarus, Tydeus, Diomedes, Achilles, Fortune, Messapus, Tolumnius, Camilla, Victory, Achilles, Vulcan, Lavinia	18	378-444	66.00	D9
12	Turnus	**Latins** and Latinus	NONE	34	459-461	1.92	T25
13	Turnus	Volusus (and officers)	NONE	19	463-467	4.92	C57
14	Matres Latinae	Minerva	NONE	35	483-485	3.00	PRA24
15	Camilla	Turnus	Aeneas	77	502-506	5.00	P44
16	Turnus	Camilla	Aeneas, Rumor, Messapus, Tiburtus	381	508-519	12.00	C58
17	Diana	Opis	Camilla, Diana, Metabus, Casmilla, Trivia	25	535-594	59.75	N24
18	Amasenus	Diana	Latona, Diana	27	557-560	4.00	PRA25
19	Camilla	Ornytus	NONE	18	686-689	4.00	T26
20	Auni filius	Camilla	NONE	65	705-708	3.75	T27
21	Camilla	Auni filius	Aunus	59	715-717	3.00	T28
22	Tarchon	Tarchon	NONE	27	732-740	9.00	E7

23	Arruns	Apollo, Jupiter	NONE	56	785-793	9.00	PRA2 6
24	Camilla	Acca	Turnus	19	825-827	4.25	F7
25	Opis	Camilla	Diana	56	841-849	8.42	A12
26	Opis	Arruns	Camilla, Diana	19	855-857	2.83	T29

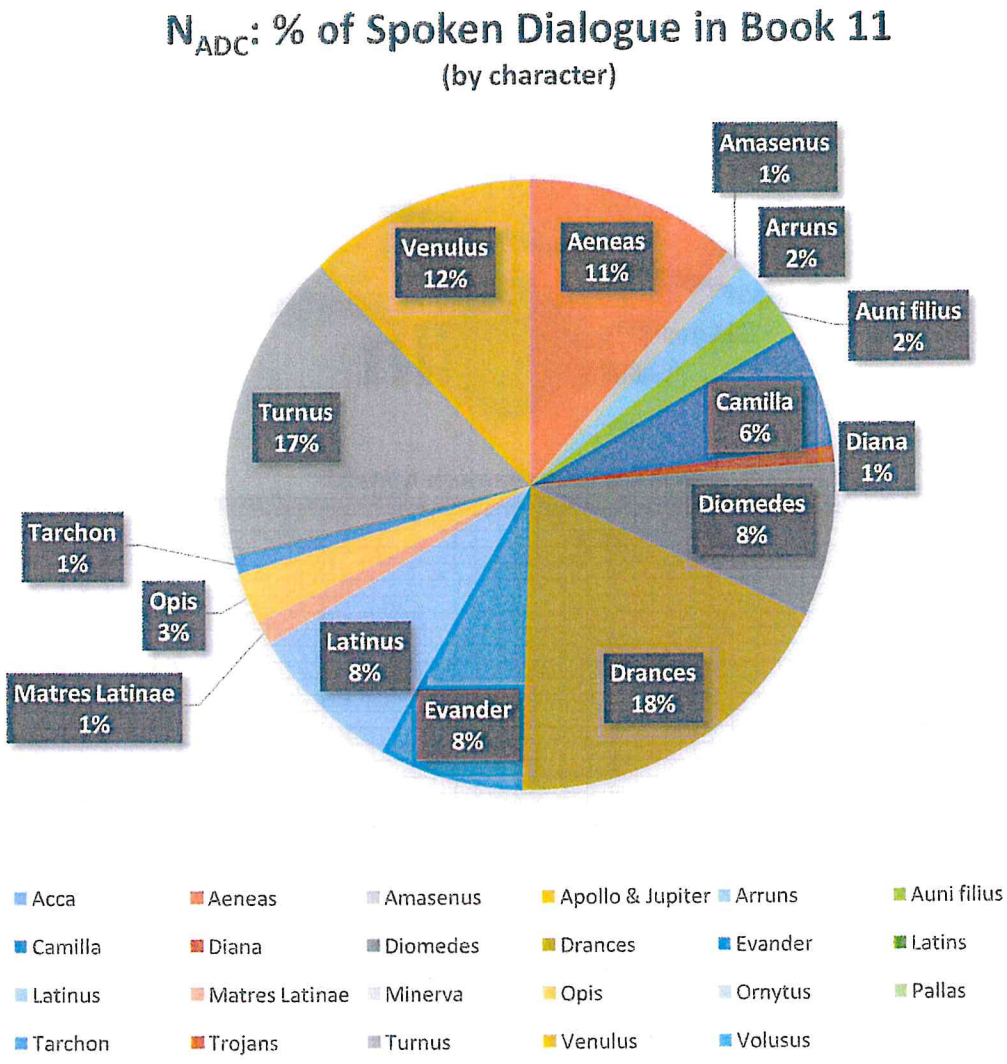


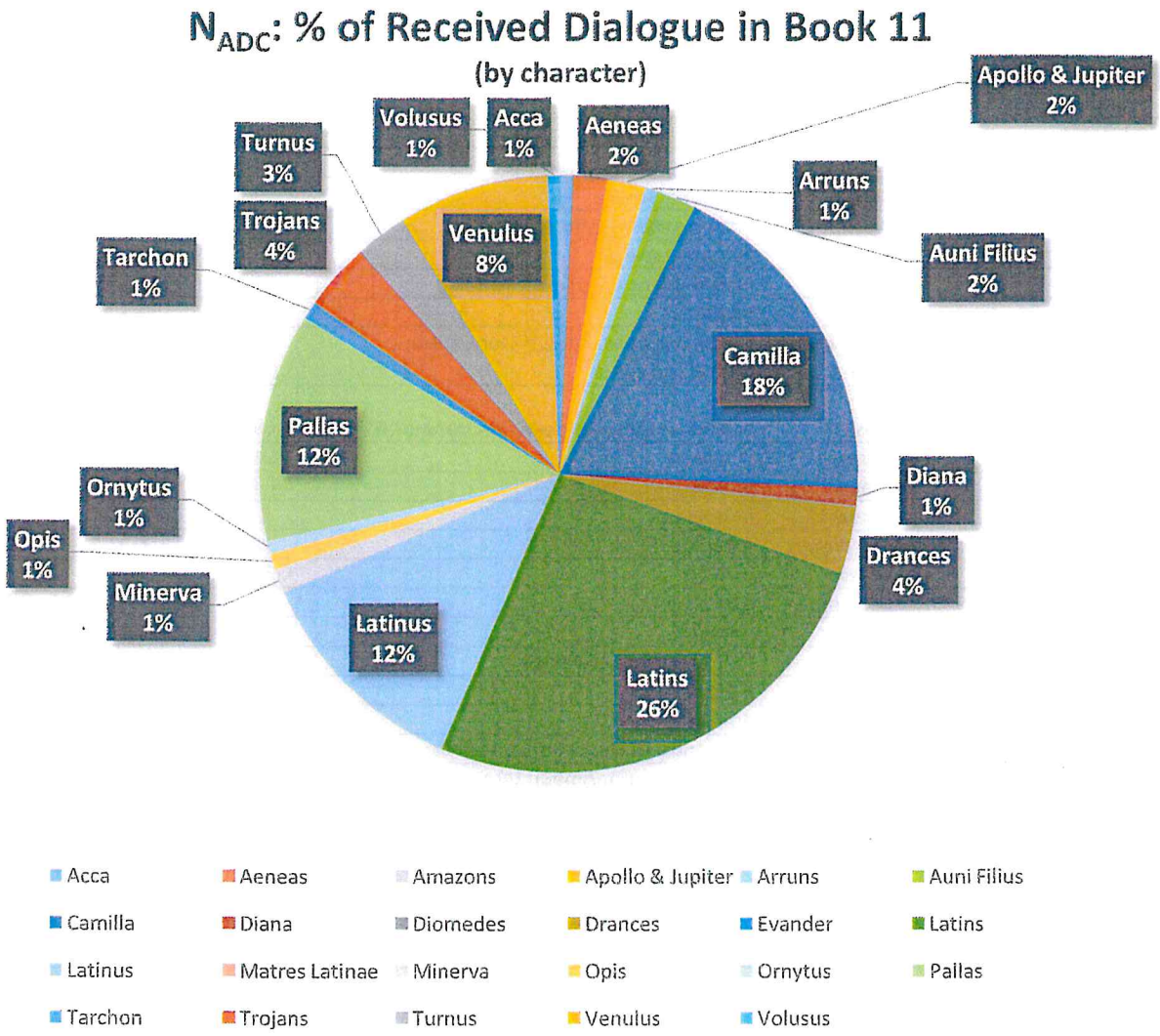
Book 11: Conversation Matrix

CHARACTERS	Acca	Aeneas	Amazons	Apollo & Jupiter	Arruns	Auni Filius	Camilla	Diana	Diomedes	Drances	Evander	Latins	Latinus	Matres Latinae	Minerva	Opis	Ornytus	Pallas	Tarchon	Trojans	Turnus	Venulus	Volusus	TOTAL	%
Acca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aeneas	0	0	0	0	0	0	0	0	0	82	0	0	0	0	0	0	0	128	0	99	0	0	0	309	11.28561
Amasenus	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0		0	0	0	0	0	0	0	27	0.9861213
Apollo & Jupiter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arruns	0	0	0	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	2.0452885
Auni filius	0	0	0	0	0	0	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	2.3739956
Camilla	19	0	0	0	0	59	0	0	0	0	0	0	0	0	0	0	18	0	0	0	77	0	0	173	6.3184806
Diana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	25	0.9130752
Diomedes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	223	0	223	8.1446311
Drances	0	50	0	0	0	0	0	0	0	0	0	455	0	0	0	0	0	0	0	0	0	0	0	505	18.44412
Evander	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211	0	0	0	0	0	211	7.706355
Latins	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Latinus	0	0	0	0	0	0	0	0	0	0	0	223	0	0	0	0	0	0	0	0	0	0	0	223	8.1446311
Matres Latinae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	35	1.2783053
Minerva	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Opis	0	0	0	0	19	0	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	2.7392257
Ornytus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pallas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tarchon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	27	0.9861213
Trojans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turnus	0	0	0	0	0	0	381	0	0	18	0	34	0	0	0	0	0	0	0	0	0	0	19	452	16.5084
Venulus	0	0	0	0	0	0	0	0	0	0	0	0	332	0	0	0	0	0	0	0	0	0	0	332	12.125639
Volusus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	19	50	0	56	19	59	502	27	0	100	0	712	332	0	35	25	18	339	27	99	77	223	19	2738	100
%	0.69	1.83	0.00	2.05	0.69	2.15	18.33	0.99	0.00	3.65	0.00	26.00	12.13	0.00	1.28	0.91	0.66	12.38	0.99	3.62	2.81	8.14	0.69	100.00	

Book 11: Conversation Matrix (Normalized)

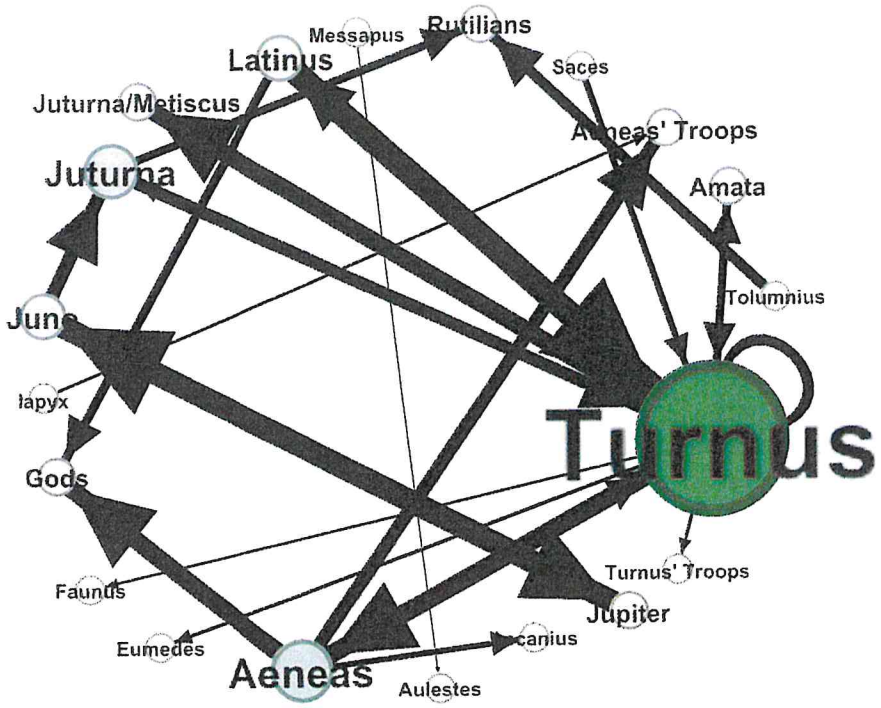
CHARACTERS	Acca	Aeneas	Amazons	Apollo & Jupiter	Arruns	Auni Filius	Camilla	Diana	Diomedes	Drances	Evander	Latins	Latinus	Matres Latinae	Minerva	Opis	Ornytus	Pallas	Tarchon	Trojans	Turnus	Venulus	Volusus	TOTAL
Acca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aeneas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.67	0.00	3.62	0.00	0.00	0.00	11.29
Amasenus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99
Apollo & Jupiter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arruns	0.00	0.00	0.00	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05
Auni filius	0.00	0.00	0.00	0.00	0.00	0.00	2.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.37
Camilla	0.69	0.00	0.00	0.00	0.00	2.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	2.81	0.00	0.00	6.32
Diana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91
Diomedes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.14	0.00	8.14
Drances	0.00	1.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.44
Evander	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.71	0.00	0.00	0.00	0.00	0.00	7.71
Latins	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Latinus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.14
Matres Latinae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.28
Minerva	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opis	0.00	0.00	0.00	0.00	0.69	0.00	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74
Ornytus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pallas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tarchon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trojans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Turnus	0.00	0.00	0.00	0.00	0.00	0.00	13.92	0.00	0.00	0.66	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	16.51
Venulus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.13
Volusus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.69	1.83	0.00	2.05	0.69	2.15	18.33	0.99	0.00	3.65	0.00	26.00	12.13	0.00	1.28	0.91	0.66	12.38	0.99	3.62	2.81	8.14	0.69	100.00


N_{ADC}: % of Spoken Dialogue in Book 11
(by character)
Amasenus 1%
Arruns 2%
Auni filius 2%
Camilla 6%
Diana 1%
Diomedes 8%
Drances 18%
Evander 8%
Latinus 8%
Matres Latinae 1%
Opis 3%
Tarchon 1%
Turnus 17%
Venulus 12%
Aeneas 11%
Acca
Aeneas
Amasenus
Apollo & Jupiter
Arruns
Auni filius
Camilla
Diana
Diomedes
Drances
Evander
Latins
Latinus
Matres Latinae
Minerva
Opis
Ornytus
Pallas
Tarchon
Trojans
Turnus
Venulus
Volusus


N_{ADC}: % of Received Dialogue in Book 11
(by character)
Apollo & Jupiter 2%
Volusus 1%
Acca 1%
Aeneas 2%
Turnus 3%
Arruns 1%
Trojans 4%
Venulus 8%
Tarchon 1%
Auni Filius 2%
Camilla 18%
Pallas 12%
Diana 1%
Ornytus 1%
Opis 1%
Drances 4%
Minerva 1%
Latinus 12%
Latins 26%
Acca
Aeneas
Amazons
Apollo & Jupiter
Arruns
Auni Filius
Camilla
Diana
Diomedes
Drances
Evander
Latins
Latinus
Matres Latinae
Minerva
Opis
Ornytus
Pallas
Tarchon
Trojans
Turnus
Venulus
Volusus

BOOK 12							
	SPEAKER	RECEIVER	SUBJECT	WORDS	LINES	# OF LINES	TYPE
1	Turnus	Latinus	Aeneas, Lavinia	46	11-17	7	C59
2	Latinus	Turnus	Daunus, Lavinia, Fortune	178	19-45	26.17	D10
3	Turnus	Latinus	Venus	46	48-53	6.00	R26
4	Amata	Turnus	Latinus, Aeneas	59	56-63	8.00	P45
5	Turnus	Amata	Idmon, Aeneas, Dawn, Lavinia	60	72-80	9.00	R27
6	Turnus	Spear	Actor, Aeneas	38	95-100	5.75	A13
7	Juno	Juturna	Jupiter, Fortune, Fates, Turnus	79	142-153	12.00	P46
8	Juno	Juturna	NONE	22	156-159	2.83	C60
9	Aeneas	Gods (Jupiter, Juno, Mars)	Turnus, Evander, Iulus, Victory, Mars, Latinus, Lavinia	130	176-194	19.00	PRA27
10	Latinus	Gods	Aeneas, Latona, Apollo, Diana, Janus, Dis	66	197-211	14.25	PRA28
11	Juturna	Rutilians	Turnus	61	229-237	9.00	E8
12	Tolumnius	Rutilians	NONE	47	259-265	6.83	E9
13	Messapus	Aulestes	Aulestes	8	296	1.00	T30
14	Aeneas	Aeneas' Troops	Turnus	37	313-317	5.00	C61
15	Turnus	Eumedes	NONE	27	359-361	3.00	T31
16	Iapyx	Aeneas' Troops	Aeneas	22	425 + 427-429	3.75	C62
17	Aeneas	Ascanius	Hector	44	435-440	6.00	F8
18	Aeneas	Aeneas' Troops	Jupiter, Latinus, Turnus	63	565-573	9.00	C63
19	Turnus	NONE	NONE	14	620-621	2.00	Q20
20	Juturna/Metiscus	Turnus	Aeneas	36	625-630	5.42	P47
21	Turnus	Juturna/Metiscus	Murranus, Ufens, Drances, Shades	128	632-649	18.00	R28
22	Saces	Turnus	Aeneas, Latinus, Amata, Messapus, Atinas	80	653-664	12.00	N25
23	Turnus	Juturna	Fate, Fortune, Aeneas	38	676-680	5.00	P48
24	Turnus	Rutilians and Latins	NONE	23	693-695	3.00	C64
25	Turnus	Faunus and Earth	Aeneas	20	777-779	2.83	PRA29
26	Jupiter	Juno	Aeneas, Fates, Juturna, Turnus	94	793-806	13.58	C65
27	Juno	Jupiter	Turnus, Juturna	140	808-828	21.00	P49
28	Jupiter	Juno	Saturn	71	830-840	11.00	O25

29	Juturna	Turnus	Juturna, Jupiter	94	872-884	13.00	A14
30	Aeneas	Turnus	NONE	40	889-893	15.00	T32
31	Turnus	Aeneas	Jupiter	13	894-895	1.58	T33
32	Turnus	Aeneas	Anchises, Daunus, Lavinia	121	931-937	7.17	P50
33	Aeneas	Turnus	Pallas	19	946-949	2.75	R29

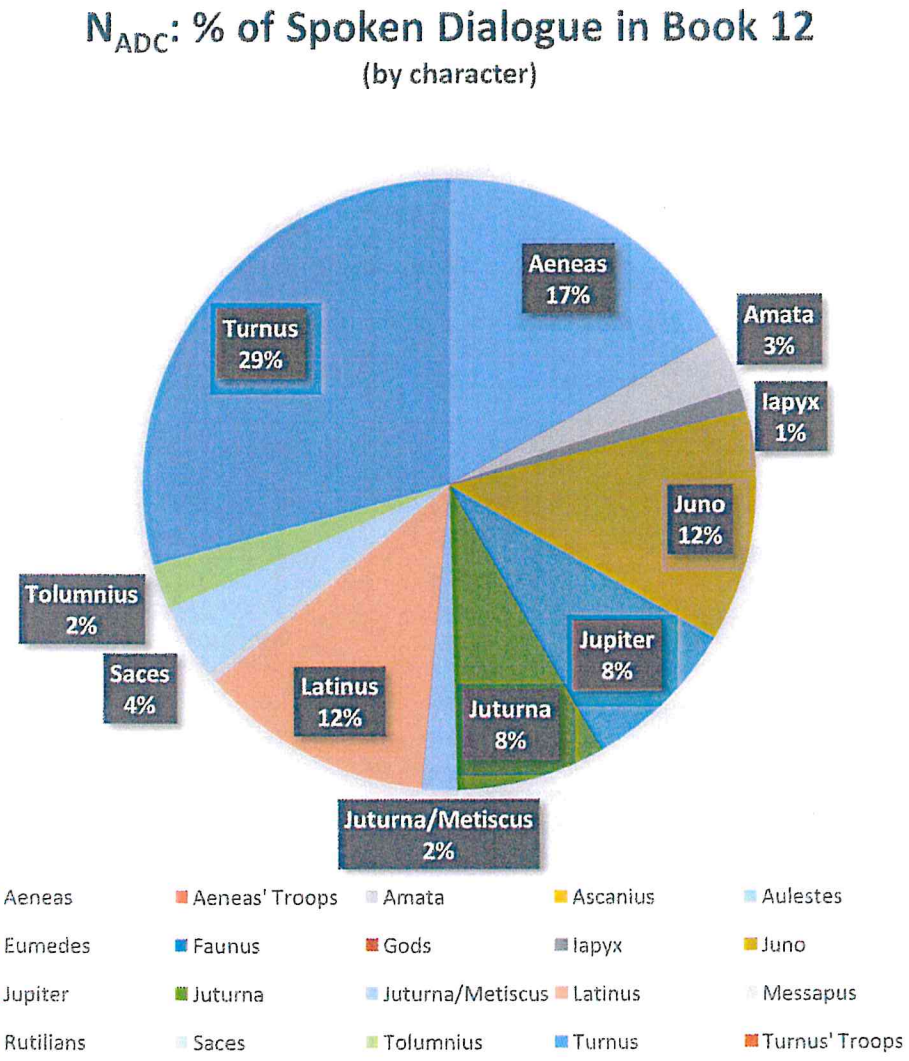


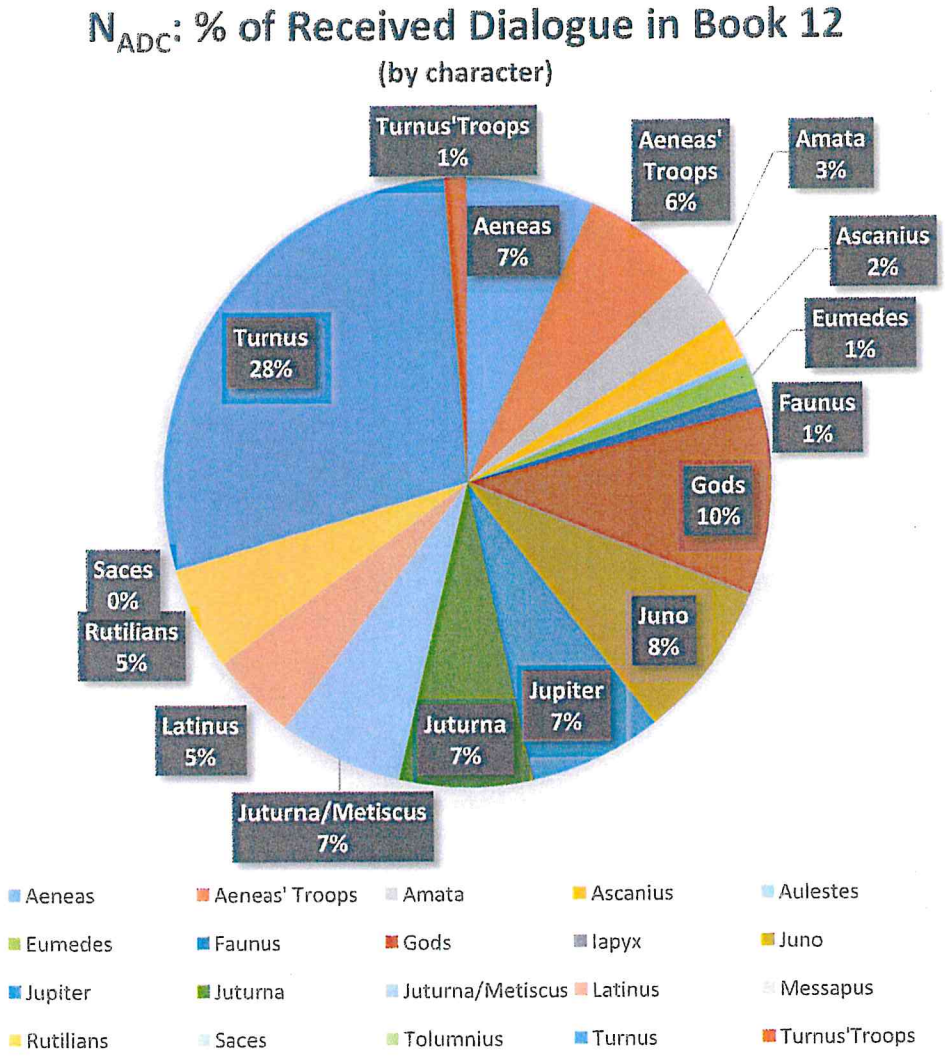
Book 12: Conversation Matrix

CHARACTERS	Aeneas	Aeneas' Troops	Amata	Ascanius	Aulestes	Eumedes	Faunus	Gods	Iapyx	Juno	Jupiter	Juturna	Juturna/Metiscus	Latinus	Messapus	Rutilians	Saces	Tolumnius	Turnus	Turnus'Troops	TOTAL	TOTAL
Aeneas	0	100	0	44	0	0	0	130	0	0	0	0	0	0	0	0	0	0	59	0	333	16.96
Aeneas' Troops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Amata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59	0	59	3.00
Ascanius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Aulestes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Eumedes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Faunus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Gods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Iapyx	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	1.12
Juno	0	0	0	0	0	0	0	0	0	0	140	101	0	0	0	0	0	0	0	0	241	12.27
Jupiter	0	0	0	0	0	0	0	0	0	165	0	0	0	0	0	0	0	0	0	0	165	8.40
Juturna	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0	0	94	0	155	7.89
Juturna/Metiscus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	36	1.83
Latinus	0	0	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0	0	178	0	244	12.42
Messapus	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0.41
Rutilians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Saces	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	0	80	4.07
Tolumnius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0	0	0	0	47	2.39
Turnus	134	0	60	0	0	27	20	0	0	0	0	38	128	92	0	0	0	0	52	23	574	29.23
Turnus' Troops	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
TOTAL	134	122	60	44	8	27	20	196	0	165	140	139	128	92	0	108	0	0	558	23	1964	100.00
%	6.82	6.21	3.05	2.24	0.41	1.37	1.02	9.98	0.00	8.40	7.13	7.08	6.52	4.68	0.00	5.50	0.00	0.00	28.41	1.17	100.00	

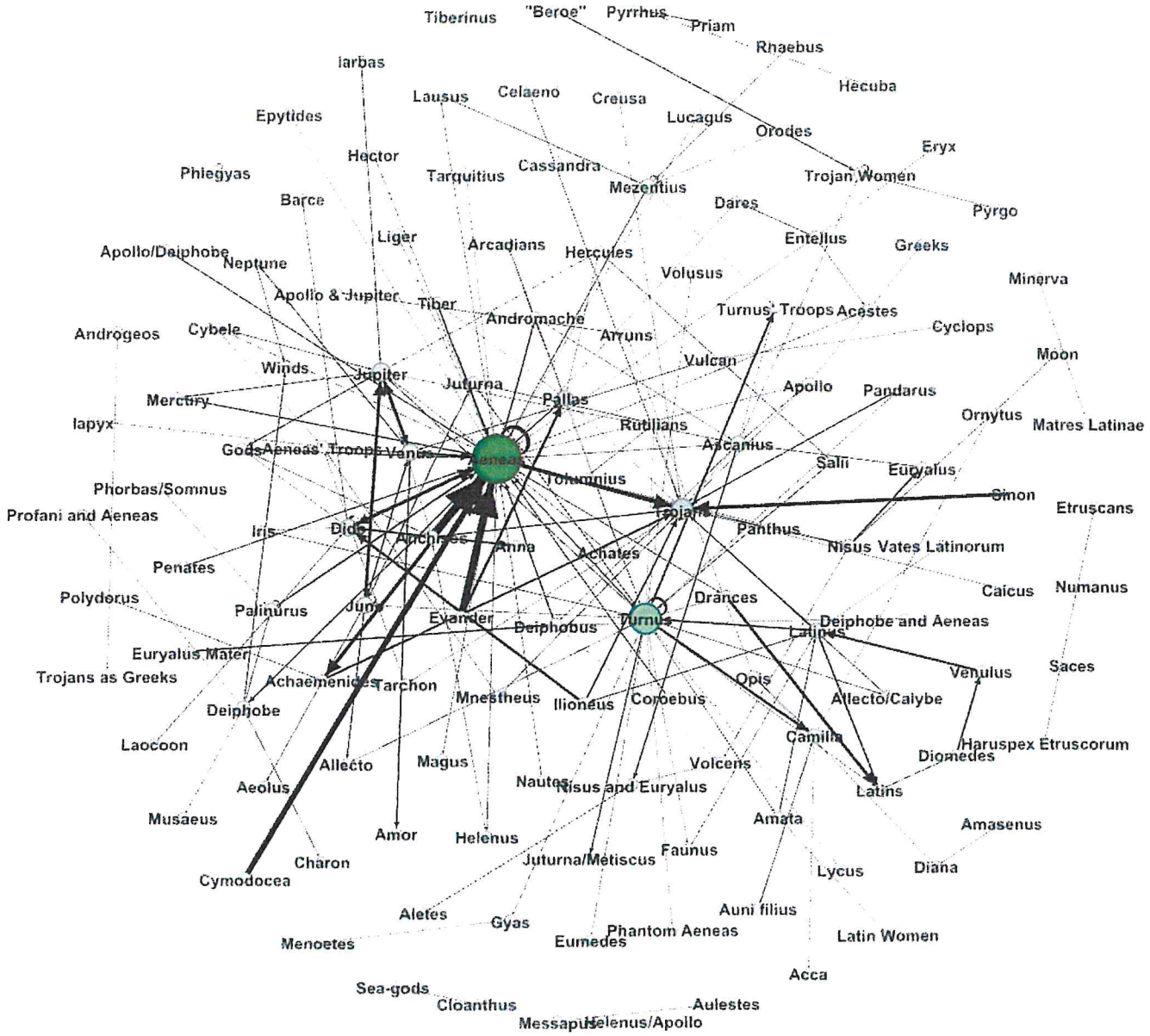
Book 12: Conversation Matrix

CHARACTERS	Aeneas	Aeneas' Troops	Amata	Ascanius	Aulestes	Eumedes	Faunus	Gods	Iapyx	Juno	Jupiter	Juturna	Juturna/Metiscus	Latinus	Messapus	Rutilians	Saces	Tolumnius	Turnus	Turnus'Troops	TOTAL
Aeneas	0.00	5.09	0.00	2.24	0.00	0.00	0.00	6.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	16.96
Aeneas' Troops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	3.00
Ascanius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulestes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eumedes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Faunus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gods	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iapyx	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Juno	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.13	5.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.27
Jupiter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.40
Juturna	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11	0.00	0.00	4.79	0.00	7.89
Juturna/Metiscus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.00	1.83
Latinus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.06	0.00	12.42
Messapus	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
Rutilians	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Saces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.07	0.00	4.07
Tolumnius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.39	0.00	0.00	0.00	0.00	2.39
Turnus	6.82	0.00	3.05	0.00	0.00	1.37	1.02	0.00	0.00	0.00	1.93	6.52	4.68	0.00	0.00	0.00	0.00	0.00	2.65	1.17	29.23
Turnus' Troops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	6.82	6.21	3.05	2.24	0.41	1.37	1.02	9.98	0.00	8.40	7.13	7.08	6.52	4.68	0.00	5.50	0.00	0.00	28.41	1.17	100.00


N_{ADC}: % of Spoken Dialogue in Book 12
(by character)
Aeneas 17%
Amata 3%
Iapyx 1%
Juno 12%
Jupiter 8%
Juturna 8%
Juturna/Metiscus 2%
Latinus 12%
Saces 4%
Tolumnius 2%
Turnus 29%
Aeneas
Aeneas' Troops
Amata
Ascanius
Aulestes
Eumedes
Faunus
Gods
Iapyx
Juno
Jupiter
Juturna
Juturna/Metiscus
Latinus
Messapus
Rutilians
Saces
Tolumnius
Turnus
Turnus' Troops


N_{ADC}: % of Received Dialogue in Book 12
(by character)
Turnus'Troops 1%
Aeneas' Troops 6%
Amata 3%
Aeneas 7%
Ascanius 2%
Eumedes 1%
Turnus 28%
Faunus 1%
Gods 10%
Saces 0%
Rutilians 5%
Juno 8%
Jupiter 7%
Latinus 5%
Juturna 7%
Juturna/Metiscus 7%
Aeneas
Aeneas' Troops
Amata
Ascanius
Aulestes
Eumedes
Faunus
Gods
Iapyx
Juno
Jupiter
Juturna
Juturna/Metiscus
Latinus
Messapus
Rutilians
Saces
Tolumnius
Turnus
Turnus'Troops

Static Conversational Network



Appendix 2: Dynamic Conversational Network Metrics

Book 1													
Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Achates	1.31	1.00	1.00	2.00	1.50	1.12	2.62	3.00	0.41	0.05	0.00	0.42	0.00
Aeneas	22.12	4.00	5.00	9.00	24.21	20.03	44.24	2.00	1.00	0.17	37.00	0.67	0.35
Aeolus	1.96	1.00	1.00	2.00	2.62	1.29	3.91	6.00	0.02	0.06	0.00	0.24	0.00
Amor	3.59	1.00	0.00	1.00	7.18	0.00	7.18	0.00	0.21	0.05	0.00	0.00	0.00
Dido	16.92	2.00	3.00	5.00	22.10	11.74	33.84	3.00	0.52	0.14	29.00	0.53	0.00
Gods	0.71	1.00	0.00	1.00	1.42	0.00	1.42	0.00	0.22	0.07	0.00	0.00	0.00
Ilioneus	10.71	2.00	1.00	3.00	8.21	16.64	24.85	4.00	0.24	0.10	16.00	0.36	0.00
Juno	5.40	1.00	2.00	3.00	1.29	6.06	7.35	5.00	0.02	0.08	9.00	0.31	0.00
Jupiter	9.01	1.00	1.00	2.00	6.96	11.05	18.01	4.00	0.21	0.05	0.00	0.36	0.00
Neptune	1.44	0.00	1.00	1.00	0.00	2.88	2.88	1.00	0.00	0.03	0.00	1.00	0.00
Trojans	1.42	1.00	0.00	1.00	2.84	0.00	2.84	0.00	0.41	0.05	0.00	0.00	0.00
Venus	23.99	2.00	3.00	5.00	18.79	29.19	47.98	3.00	0.50	0.10	19.00	0.53	0.00
Winds	1.44	1.00	0.00	1.00	2.88	0.00	2.88	0.00	0.00	0.05	0.00	0.00	0.00
Books 2													
Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Aeneas	26.41	6.00	5.00	11.00	27.35	19.72	47.07	2.00	1.00	0.16	25.00	0.75	0.21
Anchises	9.65	1.00	3.00	4.00	11.19	8.10	19.29	2.00	0.43	0.05	10.00	0.67	0.00
Androgeos	0.59	0.00	1.00	1.00	0.00	1.18	1.18	1.00	0.00	0.02	0.00	1.00	0.00

Apollo	0.56	0.00	1.00	1.00	0.00	1.12	1.12	1.00	0.00	0.02	0.00	1.00	0.00
Coroebus	0.89	0.00	1.00	1.00	0.00	1.78	1.78	3.00	0.00	0.02	0.00	0.47	0.00
Creusa	3.76	0.00	1.00	1.00	0.00	7.52	7.52	1.00	0.00	0.02	0.00	1.00	0.00
Dido	1.60	1.00	0.00	1.00	3.20	0.00	3.20	0.00	0.00	0.03	0.00	0.00	0.00
Gods	0.95	1.00	0.00	1.00	1.89	0.00	1.89	0.00	0.19	0.03	0.00	0.00	0.00
Greeks	0.56	1.00	0.00	1.00	1.12	0.00	1.12	0.00	0.00	0.03	0.00	0.00	0.00
Hector	2.10	1.00	1.00	2.00	1.78	2.43	4.21	3.00	0.43	0.05	0.00	0.46	0.00
Hecuba	0.38	0.00	1.00	1.00	0.00	0.77	0.77	2.00	0.00	0.02	0.00	0.67	0.00
Jupiter	0.65	1.00	0.00	1.00	1.30	0.00	1.30	0.00	0.19	0.03	0.00	0.00	0.00
Laocoon	1.60	0.00	1.00	1.00	0.00	3.20	3.20	1.00	0.00	0.02	0.00	1.00	0.00
Panthus	2.37	1.00	1.00	2.00	0.47	4.26	4.73	3.00	0.43	0.05	0.00	0.46	0.00
Priam	3.67	1.00	1.00	2.00	1.07	5.51	6.58	1.00	0.04	0.16	0.00	1.00	0.00
Pyrrhus	3.29	2.00	1.00	3.00	6.28	1.07	7.35	1.00	0.04	0.17	1.00	1.00	0.00
Sinon	16.61	0.00	1.00	1.00	0.00	33.21	33.21	1.00	0.00	0.02	0.00	1.00	0.00
Trojans	18.71	3.00	0.00	3.00	43.16	0.00	43.16	0.00	0.44	0.07	0.00	0.00	0.00
Trojans as Greeks	0.59	1.00	0.00	1.00	1.18	0.00	1.18	0.00	0.00	0.03	0.00	0.00	0.00
Venus	5.06	0.00	1.00	1.00	0.00	10.12	10.12	3.00	0.00	0.02	0.00	0.47	0.00

Book 3

Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Achaemenides	9.24	2.00	1.00	3.00	34.31	16.10	50.41	1.00	0.48	0.10	2.50	1.00	0.00
Aeneas	30.91	3.00	4.00	7.00	18.03	43.77	61.80	2.00	0.62	0.12	20.00	0.75	0.00
Anchises	7.14	1.00	3.00	4.00	2.55	11.73	14.28	3.00	0.35	0.07	8.00	0.57	0.00
Andromache	8.72	1.00	2.00	3.00	6.25	11.17	17.42	3.00	0.47	0.06	4.00	0.55	0.00
Apollo	1.91	1.00	1.00	2.00	1.99	1.83	3.82	1.00	0.47	0.06	1.50	1.00	0.00
Ascanius	1.16	1.00	0.00	1.00	2.32	0.00	2.32	0.00	0.35	0.07	0.00	0.00	0.00
Celaeno	1.85	0.00	1.00	1.00	0.00	3.71	3.71	1.00	0.00	0.04	0.00	1.00	0.00

Gods	0.66	1.00	0.00	1.00	1.33	0.00	1.33	0.00	0.26	0.06	0.00	0.00	0.00
Helenus	3.07	0.00	1.00	1.00	0.00	2.55	2.55	4.00	0.47	0.04	0.00	0.39	0.50
Helenus/Apollo	15.97	1.00	0.00	1.00	3.60	0.00	3.60	0.00	0.00	0.06	0.00	0.00	0.00
Penates	3.38	0.00	1.00	1.00	0.00	6.75	6.75	3.00	0.00	0.04	0.00	0.47	0.00
Polydorus	1.19	0.00	1.00	1.00	0.00	2.38	2.38	2.00	0.00	0.04	0.00	0.67	0.00
Trojans	14.80	4.00	0.00	4.00	29.61	0.00	29.61	0.00	1.00	0.23	0.00	0.00	0.00
Book 4													
Character	**Weight**	**In-Degree**	**Out-Degree**	**Degree**	**Weighted In-Degree**	**Weighted Out-Degree**	**Weighted Degree**	**Eccentricity**	**Eigenvector Centrality**	**Pageranks**	**Betweenness Centrality**	**Closeness Centrality**	**Clustering Coefficient**
Aeneas	17.66	2.00	2.00	4.00	24.78	10.55	35.33	2.00	0.52	0.12	15.00	0.67	0.00
Anna	11.19	1.00	1.00	2.00	12.57	9.81	22.38	3.00	0.49	0.07	0.00	0.50	0.00
Barce	1.06	1.00	0.00	1.00	2.12	0.00	2.12	0.00	0.49	0.07	0.00	0.00	0.00
Dido	47.37	4.00	4.00	8.00	40.39	54.34	94.73	2.00	1.00	0.19	15.00	0.80	0.30
Iarbas	1.89	0.00	1.00	1.00	0.00	3.78	3.78	5.00	0.00	0.02	0.00	0.29	0.00
Iris	0.23	0.00	1.00	1.00	0.00	0.46	0.46	3.00	0.00	0.02	0.00	0.50	0.00
Juno	4.86	1.00	1.00	2.00	2.44	7.28	9.72	1.00	0.04	0.16	0.00	1.00	0.00
Jupiter	4.26	1.00	1.00	2.00	3.78	4.74	8.52	4.00	0.00	0.05	6.00	0.35	0.00
Mercury	5.67	1.00	1.00	2.00	4.74	6.59	11.33	3.00	0.02	0.06	10.00	0.45	0.00
Trojans	0.94	1.00	0.00	1.00	1.89	0.00	1.89	0.00	0.27	0.08	0.00	0.00	0.00
Venus	4.86	1.00	1.00	2.00	7.28	2.44	9.72	1.00	0.04	0.16	0.00	1.00	0.00
Book 5													
Character	**Weight**	**In-Degree**	**Out-Degree**	**Degree**	**Weighted In-Degree**	**Weighted Out-Degree**	**Weighted Degree**	**Eccentricity**	**Eigenvector Centrality**	**Pageranks**	**Betweenness Centrality**	**Closeness Centrality**	**Clustering Coefficient**
Acestes	3.73	2.00	1.00	3.00	5.33	2.12	7.45	4.00	0.00	0.03	14.00	0.38	0.50

Aeneas	25.11	6.00	7.00	13.00	19.54	30.68	50.22	3.00	0.00	0.10	66.00	0.71	0.03
Anchises	4.79	1.00	1.00	2.00	2.38	7.20	9.58	4.00	0.00	0.02	0.00	0.43	0.00
Ascanius	0.74	0.00	1.00	1.00	0.00	1.48	1.48	1.00	0.00	0.01	0.00	1.00	0.00
"Beroe"	4.34	1.00	1.00	2.00	0.45	8.23	8.68	1.00	0.00	0.02	1.00	1.00	0.00
Cassandra	0.23	0.00	1.00	1.00	0.00	0.45	0.45	2.00	0.00	0.01	0.00	0.67	0.00
Cloanthus	0.96	0.00	1.00	1.00	0.00	1.93	1.93	1.00	0.00	0.01	0.00	1.00	0.00
Dares	3.50	2.00	1.00	3.00	5.79	1.22	7.01	4.00	0.00	0.03	0.00	0.43	0.50
Entellus	6.08	1.00	4.00	5.00	2.12	10.03	12.15	3.00	0.00	0.04	16.00	0.59	0.25
Epytides	0.74	1.00	0.00	1.00	1.48	0.00	1.48	0.00	0.00	0.02	0.00	0.00	0.00
Eryx	0.45	1.00	0.00	1.00	0.90	0.00	0.90	0.00	0.00	0.02	0.00	0.00	0.00
Gyas	0.80	0.00	1.00	1.00	0.00	1.61	1.61	1.00	0.00	0.01	0.00	1.00	0.00
Jupiter	1.32	1.00	0.00	1.00	2.64	0.00	2.64	0.00	0.00	0.02	0.00	0.00	0.00
Menoetes	0.80	1.00	0.00	1.00	1.61	0.00	1.61	0.00	0.00	0.02	0.00	0.00	0.00
Mnestheus	1.70	0.00	1.00	1.00	0.00	3.41	3.41	1.00	0.00	0.01	0.00	1.00	0.00
Nautes	2.15	0.00	1.00	1.00	0.00	4.31	4.31	4.00	0.00	0.01	0.00	0.44	0.00
Neptune	7.33	1.00	1.00	2.00	7.72	6.95	14.67	1.00	0.00	0.07	0.00	1.00	0.00
Nisus	0.84	0.00	1.00	1.00	0.00	1.67	1.67	4.00	0.00	0.01	0.00	0.44	0.00
Palinurus	5.79	3.00	3.00	6.00	5.59	5.97	11.56	4.00	0.00	0.07	16.00	0.48	0.67
Phorbas/Somnus	1.61	1.00	1.00	2.00	1.54	1.67	3.21	5.00	0.00	0.03	0.00	0.33	0.00
Pyrgo	1.41	0.00	1.00	1.00	0.00	2.83	2.83	1.00	0.00	0.01	0.00	1.00	0.00
Sea-gods	0.96	1.00	0.00	1.00	1.93	0.00	1.93	0.00	0.00	0.02	0.00	0.00	0.00
Trojan Women	6.78	4.00	1.00	5.00	13.05	0.51	13.56	0.00	0.00	0.30	0.00	0.00	0.25
Trojans	10.48	2.00	0.00	2.00	20.97	0.00	20.97	0.00	0.00	0.03	0.00	0.00	0.00
Venus	7.33	1.00	1.00	2.00	6.95	7.72	14.67	1.00	0.00	0.07	0.00	1.00	0.00

Book 6													
Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Aeneas	44.54	5.00	8.00	13.00	69.73	19.34	89.07	2.00	1.00	0.18	50.00	0.71	0.21
Anchises	17.91	1.00	1.00	2.00	2.49	33.32	35.81	3.00	0.36	0.05	0.00	0.43	0.00
Apollo/Deiphobe	2.06	1.00	0.00	1.00	4.13	0.00	4.13	0.00	0.36	0.05	0.00	0.00	0.00
Charon	1.84	1.00	1.00	2.00	1.54	2.14	3.68	4.00	0.19	0.04	0.00	0.40	0.00
Deiphobe	20.65	3.00	6.00	9.00	8.50	32.78	41.28	3.00	0.50	0.12	38.00	0.63	0.07
Deiphobe and Aeneas	0.25	1.00	0.00	1.00	0.50	0.00	0.50	0.00	0.13	0.05	0.00	0.00	0.00
Deiphobus	3.92	1.00	2.00	3.00	1.92	5.92	7.84	3.00	0.36	0.05	6.00	0.46	0.00
Dido	1.28	1.00	0.00	1.00	2.55	0.00	2.55	0.00	0.36	0.05	0.00	0.00	0.00
Musaeus	0.76	1.00	1.00	2.00	0.63	0.88	1.51	4.00	0.19	0.04	0.00	0.40	0.00
Palinurus	4.17	2.00	1.00	3.00	2.96	5.39	8.35	3.00	0.55	0.06	0.00	0.43	1.00
Phlegyas	0.22	1.00	1.00	2.00	0.22	0.22	0.44	0.00	0.02	0.18	0.00	0.00	0.00
Profani and Aeneas	0.33	1.00	0.00	1.00	0.66	0.00	0.66	0.00	0.19	0.04	0.00	0.00	0.00
Trojans	1.65	1.00	0.00	1.00	3.31	0.00	3.31	0.00	0.19	0.04	0.00	0.00	0.00
Venus	0.43	1.00	0.00	1.00	0.85	0.00	0.85	0.00	0.36	0.05	0.00	0.00	0.00

Book 7													
Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Aeneas	4.58	1.00	1.00	2.00	1.88	7.29	9.17	1.00	0.01	0.06	1.00	1.00	0.00
Allecto	6.24	2.00	0.00	2.00	12.47	0.00	12.47	0.00	1.00	0.09	0.00	0.00	0.50
Allecto/Calybe	5.67	1.00	1.00	2.00	4.21	7.14	11.35	1.00	0.17	0.05	1.00	1.00	0.00
Amata	4.40	0.00	2.00	2.00	0.00	8.79	8.79	3.00	0.00	0.03	0.00	0.47	0.00

Anchises	0.94	0.00	1.00	1.00	0.00	1.88	1.88	2.00	0.00	0.03	0.00	0.67	0.00
Ascanius	0.15	0.00	1.00	1.00	0.00	0.30	0.30	1.00	0.00	0.03	0.00	1.00	0.00
Faunus	1.47	0.00	1.00	1.00	0.00	2.93	2.93	3.00	0.00	0.03	0.00	0.44	0.00
Ilioneus	12.66	1.00	1.00	2.00	7.74	17.58	25.32	1.00	0.09	0.06	0.00	1.00	0.50
Juno	20.66	2.00	2.00	4.00	17.50	23.81	41.31	1.00	1.00	0.09	0.00	1.00	0.50
Latin Women	0.94	1.00	0.00	1.00	1.88	0.00	1.88	0.00	0.01	0.05	0.00	0.00	0.00
Latinus	14.88	3.00	3.00	6.00	10.89	18.86	29.75	2.00	0.03	0.11	18.00	0.67	0.03
Trojans	20.40	5.00	0.00	5.00	40.80	0.00	40.80	0.00	0.51	0.25	0.00	0.00	0.05
Turnus	6.50	1.00	3.00	4.00	2.63	10.37	13.00	2.00	0.09	0.06	12.00	0.80	0.08
Vates Latinorum	0.53	0.00	1.00	1.00	0.00	1.05	1.05	3.00	0.00	0.03	0.00	0.44	0.00

Book 8

Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Aeneas	39.83	4.00	3.00	7.00	65.84	13.82	79.66	2.00	1.00	0.24	14.00	0.80	0.08
Cyclops	0.63	1.00	0.00	1.00	1.27	0.00	1.27	0.00	0.05	0.05	0.00	0.00	0.00
Etruscans	0.63	1.00	0.00	1.00	1.27	0.00	1.27	0.00	0.01	0.06	0.00	0.00	0.00
Evander	36.51	1.00	2.00	3.00	10.30	62.72	73.02	2.00	0.52	0.10	0.00	0.67	1.00
Haruspex Etruscorum	0.63	0.00	1.00	1.00	0.00	1.27	1.27	1.00	0.00	0.03	0.00	1.00	0.00
Hercules	1.49	1.00	0.00	1.00	2.98	0.00	2.98	0.00	0.01	0.06	0.00	0.00	0.00
Pallas	4.86	2.00	2.00	4.00	8.31	1.40	9.71	2.00	0.80	0.14	5.00	0.67	0.33
Salii	1.49	0.00	1.00	1.00	0.00	2.98	2.98	1.00	0.00	0.03	0.00	1.00	0.00
Tiberinus	5.60	1.00	1.00	2.00	2.39	8.81	11.20	3.00	0.52	0.10	0.00	0.50	0.00
Trojans	0.41	1.00	0.00	1.00	0.81	0.00	0.81	0.00	0.41	0.09	0.00	0.00	0.00
Venus	3.86	1.00	2.00	3.00	3.07	4.65	7.72	3.00	0.05	0.05	5.00	0.54	0.00
Vulcan	4.04	1.00	2.00	3.00	3.75	4.34	8.09	4.00	0.05	0.05	1.00	0.41	0.00

Book 9													
Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Aeneas' Troops	1.95	2.00	0.00	2.00	3.91	0.00	3.91	0.00	0.53	0.08	0.00	0.00	0.00
Aletes	1.61	0.00	1.00	1.00	0.00	3.21	3.21	1.00	0.00	0.02	0.00	1.00	0.00
Apollo	1.44	0.00	1.00	1.00	0.00	2.87	2.87	4.00	0.00	0.02	0.00	0.44	0.00
Ascanius	10.71	2.00	4.00	6.00	6.66	14.01	20.67	3.00	0.51	0.10	24.00	0.67	0.00
Caicus	0.49	0.00	1.00	1.00	0.00	0.98	0.98	1.00	0.00	0.02	0.00	1.00	0.00
Cybele	4.31	1.00	2.00	3.00	3.39	5.23	8.62	1.00	0.75	0.09	7.00	1.00	0.00
Euryalus	15.82	4.00	1.00	5.00	27.85	3.79	31.64	4.00	0.52	0.08	16.00	0.43	0.08
Euryali Mater	3.47	0.00	1.00	1.00	0.00	11.49	11.49	5.00	0.00	0.02	0.00	0.33	0.00
Iris	2.35	1.00	1.00	2.00	1.78	2.93	4.71	3.00	0.15	0.03	0.00	0.50	0.00
Jupiter	4.56	2.00	1.00	3.00	5.74	3.39	9.13	2.00	1.00	0.08	12.00	0.67	0.00
Lycus	0.20	1.00	0.00	1.00	0.40	0.00	0.40	0.00	0.15	0.03	0.00	0.00	0.00
Mnestheus	1.23	0.00	1.00	1.00	0.00	2.47	2.47	1.00	0.00	0.02	0.00	1.00	0.00
Moon	1.35	1.00	0.00	1.00	2.70	0.00	2.70	0.00	0.01	0.03	0.00	0.00	0.00
Nisus	12.80	0.00	4.00	4.00	0.00	21.81	21.81	5.00	0.00	0.02	0.00	0.43	0.08
Nisus and Euryalus	6.31	3.00	0.00	3.00	12.63	0.00	12.63	0.00	0.51	0.07	0.00	0.00	0.00
Numanus	4.31	0.00	1.00	1.00	0.00	8.61	8.61	1.00	0.00	0.02	0.00	1.00	0.00
Pandarus	1.44	1.00	1.00	2.00	1.78	1.09	2.87	1.00	0.15	0.03	2.00	1.00	0.00
Rutilians	0.29	1.00	0.00	1.00	0.57	0.00	0.57	0.00	0.15	0.03	0.00	0.00	0.00
Trojans	7.41	4.00	0.00	4.00	14.81	0.00	14.81	0.00	0.17	0.09	0.00	0.00	0.00
Turnus	9.93	1.00	5.00	6.00	2.93	16.93	19.86	2.00	0.15	0.05	5.00	0.86	0.00
Turnus' Troops	6.54	2.00	0.00	2.00	13.09	0.00	13.09	0.00	0.62	0.05	0.00	0.00	0.00
Volcens	1.49	1.00	2.00	3.00	1.78	1.21	2.99	5.00	0.01	0.03	1.00	0.37	0.17

Book 11													
Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Achates	0.46	1.00	0.00	1.00	0.91	0.00	0.91	0.00	0.39	0.03	0.00	0.00	0.00
Aeneas	13.03	5.00	9.00	14.00	15.37	10.68	26.05	2.00	1.00	0.12	43.00	0.79	0.14
Aeneas' Troops	0.78	1.00	0.00	1.00	1.56	0.00	1.56	0.00	0.00	0.04	0.00	0.00	0.00
Phantom Aeneas	0.38	1.00	0.00	1.00	0.75	0.00	0.75	0.00	0.02	0.03	0.00	0.00	0.00
Arcadians	2.61	2.00	0.00	2.00	5.22	0.00	5.22	0.00	0.04	0.03	0.00	0.00	1.00
Cybele	0.73	1.00	0.00	1.00	1.45	0.00	1.45	0.00	0.39	0.03	0.00	0.00	0.00
Cymodocea	3.20	0.00	1.00	1.00	0.00	6.39	6.39	3.00	0.00	0.02	0.00	0.46	0.00
Gods	3.39	1.00	0.00	1.00	6.77	0.00	6.77	0.00	0.05	0.05	0.00	0.00	0.00
Hercules	1.83	2.00	0.00	2.00	3.66	0.00	3.66	0.00	0.07	0.05	0.00	0.00	0.00
Juno	10.77	1.00	1.00	2.00	3.49	18.05	21.54	2.00	0.05	0.05	0.00	0.60	0.00
Jupiter	25.42	3.00	3.00	6.00	38.30	12.52	50.82	1.00	0.06	0.08	9.50	1.00	0.00
Lausus	2.96	2.00	0.00	2.00	5.91	0.00	5.91	0.00	0.70	0.04	0.00	0.00	1.00
Liger	1.21	1.00	1.00	2.00	0.59	1.83	2.42	3.00	0.39	0.03	0.00	0.46	0.00
Lucagus	0.51	1.00	0.00	1.00	1.02	0.00	1.02	0.00	0.39	0.03	0.00	0.00	0.00
Magus	1.80	1.00	1.00	2.00	1.45	2.15	3.60	3.00	0.39	0.03	0.00	0.46	0.00
Mezentius	8.01	3.00	6.00	9.00	3.38	12.63	16.01	2.00	0.82	0.07	22.00	0.65	0.27
Orodes	0.89	1.00	1.00	2.00	0.59	1.18	1.77	3.00	0.31	0.03	0.00	0.41	0.00
Pallas	3.84	1.00	4.00	5.00	0.38	7.31	7.69	3.00	0.02	0.03	1.50	0.56	0.08
Rhaebus	1.18	1.00	0.00	1.00	2.36	0.00	2.36	0.00	0.31	0.03	0.00	0.00	0.00
Tarchon	0.78	0.00	1.00	1.00	0.00	1.56	1.56	1.00	0.00	0.02	0.00	1.00	0.00
Tarquitius	0.70	1.00	0.00	1.00	1.40	0.00	1.40	0.00	0.39	0.03	0.00	0.00	0.00
Tiber	0.59	1.00	0.00	1.00	1.18	0.00	1.18	0.00	0.02	0.03	0.00	0.00	0.00
Turnus	5.51	1.00	5.00	6.00	0.91	10.10	11.01	2.00	0.02	0.03	5.00	0.69	0.05
Turnus' Troops	1.67	2.00	0.00	2.00	3.33	0.00	3.33	0.00	0.33	0.04	0.00	0.00	0.00

Venus	7.79	0.00	1.00	1.00	0.00	15.58	15.58	2.00	0.00	0.02	0.00	0.57	0.00
Book 12													
Character	**Weight**	**In-Degree**	**Out-Degree**	**Degree**	**Weighted In-Degree**	**Weighted Out-Degree**	**Weighted Degree**	**Eccentricity**	**Eigenvector Centrality**	**Pageranks**	**Betweenness Centrality**	**Closeness Centrality**	**Clustering Coefficient**
Acca	0.35	1.00	0.00	1.00	0.69	0.00	0.69	0.00	0.65	0.04	0.00	0.00	0.00
Aeneas	6.56	1.00	3.00	4.00	1.83	11.28	13.11	2.00	0.51	0.04	21.00	0.71	0.00
Amasenus	0.49	0.00	1.00	1.00	0.00	0.99	0.99	8.00	0.00	0.02	0.00	0.22	0.00
Apollo & Jupiter	1.02	1.00	0.00	1.00	2.05	0.00	2.05	0.00	0.08	0.06	0.00	0.00	0.00
Arruns	1.37	1.00	1.00	2.00	0.69	2.05	2.74	1.00	0.06	0.04	3.00	1.00	0.00
Auni filius	2.26	1.00	1.00	2.00	2.15	2.37	4.52	6.00	0.65	0.04	0.00	0.31	0.00
Camilla	12.33	3.00	4.00	7.00	18.34	6.31	24.65	5.00	0.93	0.09	46.00	0.42	0.00
Diana	0.95	1.00	1.00	2.00	0.99	0.91	1.90	7.00	0.01	0.04	15.00	0.27	0.00
Diomedes	4.07	0.00	1.00	1.00	0.00	8.14	8.14	3.00	0.00	0.02	0.00	0.50	0.00
Drances	11.05	2.00	2.00	4.00	3.65	18.45	22.10	3.00	0.77	0.04	25.00	0.56	0.17
Evander	3.85	0.00	1.00	1.00	0.00	7.71	7.71	1.00	0.00	0.02	0.00	1.00	0.00
Latins	13.00	3.00	0.00	3.00	26.00	0.00	26.00	0.00	1.00	0.09	0.00	0.00	0.17
Latinus	10.14	1.00	1.00	2.00	0.69	8.14	8.83	1.00	0.03	0.05	2.00	1.00	0.00
Matres Latinae	0.64	0.00	1.00	1.00	0.00	1.28	1.28	1.00	0.00	0.02	0.00	1.00	0.00
Minerva	0.64	1.00	0.00	1.00	1.28	0.00	1.28	0.00	0.01	0.04	0.00	0.00	0.00
Opis	1.83	1.00	2.00	3.00	0.91	2.74	3.65	6.00	0.03	0.05	28.00	0.34	0.00
Ornytus	0.33	1.00	0.00	1.00	0.66	0.00	0.66	0.00	0.65	0.04	0.00	0.00	0.00
Pallas	6.19	2.00	0.00	2.00	12.38	0.00	12.38	0.00	0.34	0.05	0.00	0.00	0.00
Tarchon	0.99	1.00	0.00	1.00	0.99	0.00	0.99	0.00	0.22	0.05	0.00	0.00	0.00
Trojans	1.81	1.00	1.00	2.00	3.62	0.99	4.61	1.00	0.33	0.03	8.00	1.00	0.00
Turnus	9.66	1.00	4.00	5.00	2.81	27.95	30.76	4.00	0.65	0.04	35.00	0.50	0.08
Venulus	10.14	1.00	1.00	2.00	8.14	0.69	8.83	2.00	0.01	0.04	2.00	0.67	0.00
Volusus	0.35	1.00	0.00	1.00	12.13	0.00	12.13	0.00	0.44	0.03	0.00	0.00	0.00

Static Conversational Network – The Entirety of the *Aeneid*													
Character	**Weight**	**In-Degree**	**Out-Degree**	**Degree**	**Weighted In-Degree**	**Weighted Out-Degree**	**Weighted Degree**	**Eccentricity**	**Eigenvector Centrality**	**Pageranks**	**Betweenness Centrality**	**Closeness Centrality**	**Clustering Coefficient**
Aeneas	11.89	1.00	4.00	5.00	6.82	16.95	23.77	3.00	0.36	0.04	19.50	0.57	0.00
Aeneas' Troops	3.11	2.00	0.00	2.00	6.21	0.00	6.21	0.00	0.13	0.05	0.00	0.00	0.00
Amata	3.03	1.00	1.00	2.00	3.05	3.00	6.05	3.00	0.36	0.04	0.00	0.44	0.00
Ascanius	1.12	1.00	0.00	1.00	2.24	0.00	2.24	0.00	0.13	0.03	0.00	0.00	0.00
Aulestes	0.20	1.00	0.00	1.00	0.41	0.00	0.41	0.00	0.00	0.04	0.00	0.00	0.00
Eumedes	0.69	1.00	0.00	1.00	1.37	0.00	1.37	0.00	0.36	0.04	0.00	0.00	0.00
Faunus	0.51	1.00	0.00	1.00	1.02	0.00	1.02	0.00	0.36	0.04	0.00	0.00	0.00
Gods	4.99	2.00	0.00	2.00	9.98	0.00	9.98	0.00	0.25	0.05	0.00	0.00	0.00
Iapyx	0.56	0.00	1.00	1.00	0.00	1.12	1.12	1.00	0.00	0.02	0.00	1.00	0.00
Juno	10.34	1.00	2.00	3.00	8.40	12.27	20.67	4.00	0.02	0.07	13.00	0.36	0.00
Jupiter	7.76	1.00	1.00	2.00	7.13	8.40	15.53	5.00	0.02	0.05	0.00	0.27	0.00
Juturna	7.48	2.00	2.00	4.00	7.07	7.90	14.97	3.00	0.37	0.07	30.00	0.48	0.00
Juturna/ Metiscus	4.18	1.00	1.00	2.00	6.52	1.83	8.35	3.00	0.36	0.04	0.00	0.44	0.00
Latinus	8.55	1.00	2.00	3.00	4.68	12.42	17.10	3.00	0.36	0.04	3.50	0.48	0.00
Messapus	0.20	0.00	1.00	1.00	0.00	0.41	0.41	1.00	0.00	0.02	0.00	1.00	0.00
Rutilians	2.75	2.00	0.00	2.00	7.18	0.00	7.18	0.00	0.14	0.07	0.00	0.00	0.00
Saces	2.04	0.00	1.00	1.00	0.00	2.39	2.39	3.00	0.00	0.02	0.00	0.45	0.00
Tolumnius	1.20	0.00	1.00	1.00	0.00	4.07	4.07	1.00	0.00	0.02	0.00	1.00	0.00
Turnus	28.82	7.00	9.00	16.00	26.72	29.21	55.93	2.00	1.00	0.19	82.00	0.75	0.16
Turnus' Troops	0.59	1.00	0.00	1.00	1.17	0.00	1.17	0.00	0.36	0.04	0.00	0.00	0.00
The Entirety of the *Aeneid*													

Character	Weight	In-Degree	Out-Degree	Degree	Weighted In-Degree	Weighted Out-Degree	Weighted Degree	Eccentricity	Eigenvector Centrality	Pageranks	Betweenness Centrality	Closeness Centrality	Clustering Coefficient
Acca	0.04	1.00	0.00	1.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Acestes	0.24	2.00	1.00	3.00	0.34	0.14	0.48	6.00	0.28	0.29	122.00	0.01	0.50
Achaemenides	0.70	2.00	1.00	3.00	2.54	1.19	3.74	3.00	0.50	0.61	3.00	0.01	0.17
Achates	0.16	1.00	1.00	2.00	0.21	0.11	0.32	5.00	0.37	0.40	0.00	0.00	0.00
Aeneas	22.36	25.00	35.00	60.00	25.64	17.04	42.68	4.00	0.58	0.68	4038.17	0.06	0.05
Aeneas' Troops	0.46	5.00	0.00	5.00	0.90	0.00	0.90	0.00	0.00	0.00	0.00	0.05	0.05
Aeolus	0.19	1.00	1.00	2.00	0.25	0.12	0.37	6.00	0.25	0.27	0.00	0.00	0.00
Aletes	0.12	0.00	1.00	1.00	0.00	0.23	0.23	1.00	1.00	1.00	0.00	0.00	0.00
Allecto	0.35	2.00	0.00	2.00	0.68	0.00	0.68	0.00	0.00	0.00	0.00	0.01	0.50
Allecto/Calybe	0.32	1.00	1.00	2.00	0.23	0.39	0.62	3.00	0.50	0.61	2.92	0.00	0.00
Amasenus	0.06	0.00	1.00	1.00	0.00	0.11	0.11	8.00	0.17	0.19	0.00	0.00	0.00
Amata	0.50	1.00	3.00	4.00	0.25	0.72	0.97	5.00	0.34	0.38	62.00	0.00	0.33
Amor	0.35	1.00	0.00	1.00	0.68	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00
Anchises	3.99	2.00	4.00	6.00	1.44	6.33	7.77	5.00	0.38	0.42	83.00	0.01	0.25
Androgeos	0.04	0.00	1.00	1.00	0.00	0.08	0.08	1.00	1.00	1.00	0.00	0.00	0.00
Andromache	0.66	1.00	2.00	3.00	0.46	0.83	1.29	5.00	0.38	0.41	0.00	0.00	0.50
Anna	1.02	1.00	1.00	2.00	1.12	0.87	1.99	6.00	0.28	0.30	0.00	0.01	0.00
Apollo	0.29	1.00	3.00	4.00	0.15	0.42	0.57	7.00	0.24	0.28	62.00	0.00	0.25
Apollo & Jupiter	0.12	1.00	0.00	1.00	0.23	0.00	0.23	0.00	0.00	0.00	0.00	0.01	0.00
Apollo/Deiphobe	0.28	1.00	0.00	1.00	0.54	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00
Arcadians	0.20	2.00	0.00	2.00	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.00	1.00
Arruns	0.16	1.00	1.00	2.00	0.08	0.23	0.31	1.00	1.00	1.00	3.00	0.01	0.00
Ascanius	1.02	4.00	6.00	10.00	0.83	1.11	1.94	6.00	0.30	0.36	298.11	0.01	0.09
Aulestes	0.02	1.00	0.00	1.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Auni filius	0.26	1.00	1.00	2.00	0.24	0.27	0.51	6.00	0.26	0.28	0.00	0.00	0.00

Barce	0.10	1.00	0.00	1.00	0.19	0.00	0.19	0.00	0.00	0.00	0.00	0.01	0.00
"Beroe"	0.28	1.00	1.00	2.00	0.03	0.52	0.55	1.00	1.00	1.00	1.00	0.00	0.00
Caicus	0.04	0.00	1.00	1.00	0.00	0.07	0.07	3.00	0.50	0.61	0.00	0.00	0.00
Camilla	1.42	3.00	4.00	7.00	2.06	0.71	2.77	5.00	0.34	0.39	509.00	0.01	0.00
Cassandra	0.01	0.00	1.00	1.00	0.00	0.03	0.03	2.00	0.67	0.75	0.00	0.00	0.00
Celaeno	0.14	0.00	1.00	1.00	0.00	0.27	0.27	3.00	0.50	0.61	0.00	0.00	0.00
Charon	0.25	1.00	1.00	2.00	0.20	0.28	0.48	7.00	0.22	0.24	0.00	0.00	0.00
Cloanthus	0.06	0.00	1.00	1.00	0.00	0.12	0.12	1.00	1.00	1.00	0.00	0.00	0.00
Coroebus	0.06	0.00	1.00	1.00	0.00	0.52	0.52	5.00	0.37	0.40	0.00	0.00	0.00
Creusa	0.27	0.00	1.00	1.00	0.00	0.12	0.12	3.00	0.50	0.61	0.00	0.00	0.00
Cybele	0.37	2.00	2.00	4.00	0.35	0.37	0.73	7.00	0.23	0.26	3.67	0.01	0.33
Cyclops	0.06	1.00	0.00	1.00	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Cymodocea	0.25	0.00	1.00	1.00	0.00	3.81	3.81	5.00	0.37	0.40	0.00	0.00	0.00
Dares	0.23	2.00	0.00	2.00	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.01	0.50
Deiphobe	2.76	3.00	5.00	8.00	1.11	1.03	2.14	6.00	0.28	0.33	396.50	0.01	0.07
Deiphobe and Aeneas	0.03	1.00	0.00	1.00	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.01	0.00
Deiphobus	0.52	4.00	2.00	6.00	1.30	0.77	2.07	5.00	0.37	0.40	408.67	0.01	0.05
Diana	0.11	1.00	1.00	2.00	0.11	0.10	0.21	7.00	0.21	0.23	88.00	0.00	0.00
Dido	6.28	6.00	6.00	12.00	6.26	5.96	12.22	5.00	0.38	0.43	431.42	0.02	0.20
Diomedes	0.47	1.00	1.00	2.00	0.27	0.91	1.19	7.00	0.21	0.23	143.00	0.01	0.00
Drances	1.28	2.00	2.00	4.00	0.41	2.07	2.48	4.00	0.38	0.41	61.60	0.00	0.50
Entellus	0.40	1.00	4.00	5.00	0.14	0.64	0.78	5.00	0.38	0.42	144.00	0.01	0.17
Epytides	0.05	1.00	0.00	1.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Eryx	0.03	1.00	0.00	1.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Etruscans	0.06	1.00	0.00	1.00	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Eumedes	0.06	1.00	0.00	1.00	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Euryalus	1.16	1.00	1.00	2.00	0.94	0.27	1.21	7.00	0.24	0.26	1.25	0.00	0.00
Euryalus Mater	0.26	0.00	1.00	1.00	0.00	0.82	0.82	6.00	0.27	0.29	0.00	0.00	0.00
Evander	3.85	1.00	2.00	3.00	0.94	6.56	7.49	5.00	0.37	0.41	0.00	0.00	1.00
Faunus	0.12	1.00	1.00	2.00	0.08	0.16	0.24	6.00	0.26	0.28	0.00	0.00	1.00

Gods	0.87	4.00	0.00	4.00	1.42	0.00	1.42	0.00	0.00	0.00	0.00	0.01	0.50
Greeks	0.04	1.00	0.00	1.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Gyas	0.05	1.00	1.00	2.00	0.13	0.10	0.23	1.00	1.00	1.00	63.00	0.00	0.00
Haruspex Etruscorum	0.06	0.00	1.00	1.00	0.00	0.11	0.11	1.00	1.00	1.00	0.00	0.00	0.00
Hector	0.15	1.00	1.00	2.00	0.12	0.17	0.29	5.00	0.37	0.40	0.00	0.00	0.00
Hecuba	0.03	0.00	1.00	1.00	0.00	0.05	0.05	2.00	0.67	0.75	0.00	0.00	0.00
Helenus	0.23	1.00	1.00	2.00	0.27	0.19	0.46	6.00	0.28	0.30	0.00	0.00	1.00
Helenus/Apollo	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hercules	0.28	3.00	0.00	3.00	0.55	0.00	0.55	0.00	0.00	0.00	0.00	0.01	0.00
Iapyx	0.05	0.00	1.00	1.00	0.00	0.09	0.09	1.00	1.00	1.00	0.00	0.00	0.00
Iarbas	0.17	0.00	1.00	1.00	0.00	0.34	0.34	7.00	0.23	0.26	0.00	0.00	0.00
Ilioneus	1.76	2.00	2.00	4.00	0.88	2.55	3.42	6.00	0.28	0.31	24.75	0.01	0.17
Iris	0.19	0.00	2.00	2.00	0.00	0.25	0.25	5.00	0.35	0.38	0.00	0.00	0.00
Juno	0.25	5.00	6.00	11.00	2.57	4.89	7.46	5.00	0.33	0.37	218.75	0.01	0.36
Jupiter	4.38	8.00	6.00	14.00	5.17	3.35	8.52	6.00	0.30	0.35	380.08	0.02	0.13
Juturna	0.62	2.00	2.00	4.00	0.57	0.64	1.21	5.00	0.34	0.37	79.83	0.01	0.33
Juturna/ Metiscus	0.35	1.00	1.00	2.00	0.52	0.15	0.67	5.00	0.33	0.36	0.00	0.00	0.00
Laocoon	0.11	0.00	1.00	1.00	0.00	0.22	0.22	6.00	0.28	0.30	0.00	0.00	0.00
Latin Women	0.05	1.00	0.00	1.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
Latins	1.50	3.00	1.00	4.00	2.92	0.27	3.19	8.00	0.17	0.19	121.00	0.01	0.25
Latinus	2.71	5.00	4.00	9.00	2.33	2.67	5.01	5.00	0.35	0.39	432.42	0.02	0.09
Lausus	0.23	2.00	0.00	2.00	0.45	0.00	0.45	0.00	0.00	0.00	0.00	0.01	1.00
Liger	0.09	1.00	1.00	2.00	0.05	0.14	0.18	5.00	0.37	0.40	0.00	0.00	0.00
Lucagus	0.04	1.00	0.00	1.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Lycus	0.01	1.00	0.00	1.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Magus	0.14	1.00	1.00	2.00	0.11	0.16	0.27	5.00	0.37	0.40	0.00	0.00	0.00
Matres Latinae	0.07	0.00	1.00	1.00	0.00	0.14	0.14	1.00	1.00	1.00	0.00	0.00	0.00
Menoetes	0.05	1.00	0.00	1.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.01	0.00
Mercury	0.52	1.00	1.00	2.00	0.42	0.59	1.01	5.00	0.37	0.40	91.59	0.00	0.50

Messapus	0.02	0.00	1.00	1.00	0.00	0.03	0.03	1.00	1.00	1.00	0.00	0.00	0.00
Mezentius	0.63	3.00	6.00	9.00	0.26	0.96	1.22	5.00	0.38	0.43	217.02	0.01	0.27
Minerva	0.07	1.00	0.00	1.00	0.14	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Mnestheus	0.20	0.00	2.00	2.00	0.00	0.45	0.45	2.00	0.75	0.83	0.00	0.00	0.00
Moon	0.10	1.00	0.00	1.00	0.19	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00
Musaeus	0.10	1.00	1.00	2.00	0.08	0.11	0.20	7.00	0.22	0.24	0.00	0.00	0.00
Nautes	0.14	0.00	1.00	1.00	0.00	0.22	0.22	5.00	0.37	0.40	0.00	0.00	0.00
Neptune	0.62	1.00	2.00	3.00	0.49	0.72	1.21	6.00	0.29	0.32	8.50	0.00	0.00
Nisus	0.99	0.00	5.00	5.00	0.00	1.67	1.67	5.00	0.38	0.43	0.00	0.00	0.05
Nisus and Euryalus	0.46	3.00	0.00	3.00	0.90	0.00	0.90	0.00	0.00	0.00	0.00	0.01	0.00
Numanus	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opis	0.21	1.00	2.00	3.00	0.10	0.31	0.41	6.00	0.26	0.29	174.00	0.01	0.00
Ornytus	0.04	1.00	0.00	1.00	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
Orodes	0.07	1.00	1.00	2.00	0.05	0.09	0.14	6.00	0.28	0.30	0.00	0.00	0.00
Palinurus	0.94	4.00	3.00	7.00	0.74	1.08	1.83	5.00	0.37	0.40	378.00	0.02	0.50
Pallas	1.47	3.00	6.00	9.00	2.17	0.68	2.86	4.00	0.43	0.48	71.03	0.01	0.19
Pandarus	0.11	1.00	1.00	2.00	0.13	0.62	0.74	3.00	0.50	0.61	2.92	0.00	0.00
Panthus	0.17	1.00	1.00	2.00	0.03	0.30	0.33	5.00	0.37	0.40	0.00	0.00	0.00
Penates	0.26	0.00	1.00	1.00	0.00	0.50	0.50	5.00	0.37	0.40	0.00	0.00	0.00
Phantom Aeneas	0.03	1.00	0.00	1.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
Phlegyas	0.03	1.00	1.00	2.00	0.03	0.03	0.06	0.00	0.00	0.00	0.00	0.02	0.00
Phorbas/Somnus	0.11	1.00	1.00	2.00	0.10	0.11	0.21	6.00	0.27	0.29	0.00	0.01	0.00
Polydorus	0.09	0.00	1.00	1.00	0.00	0.18	0.18	4.00	0.40	0.52	0.00	0.00	0.00
Priam	0.26	1.00	1.00	2.00	0.07	0.38	0.46	1.00	1.00	1.00	0.00	0.02	0.00
Profani and Aeneas	0.04	1.00	0.00	1.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Pyrgo	0.09	0.00	1.00	1.00	0.00	0.18	0.18	1.00	1.00	1.00	0.00	0.00	0.00
Pyrrhus	0.23	2.00	1.00	3.00	0.43	0.07	0.51	1.00	1.00	1.00	1.00	0.03	0.00
Rhaebus	0.09	1.00	0.00	1.00	0.18	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Rutilians	0.25	3.00	1.00	4.00	0.48	0.08	0.56	3.00	0.50	0.61	9.92	0.01	0.17

Saces	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salii	0.14	0.00	2.00	2.00	0.00	0.60	0.60	5.00	0.34	0.37	0.00	0.00	0.00
Sea-gods	0.06	1.00	0.00	1.00	0.12	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Sinon	1.18	0.00	1.00	1.00	0.00	2.30	2.30	3.00	0.50	0.61	0.00	0.00	0.00
Tarchon	0.17	1.00	1.00	2.00	0.11	0.12	0.23	1.00	1.00	1.00	16.17	0.04	0.00
Tarquitius	0.05	1.00	0.00	1.00	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00
Tiber	0.05	2.00	1.00	3.00	0.31	0.80	1.11	5.00	0.37	0.40	0.00	0.01	1.00
Tiberinus	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tolumnius	0.10	0.00	1.00	1.00	0.00	0.19	0.19	4.00	0.40	0.52	0.00	0.00	0.00
Trojan Women	0.44	4.00	1.00	5.00	0.83	0.03	0.87	0.00	0.00	0.00	0.00	0.07	0.25
Trojans	5.53	17.00	1.00	18.00	10.39	0.11	10.50	2.00	0.67	0.75	89.17	0.05	0.03
Trojans as Greeks	0.04	1.00	0.00	1.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Turnus	5.03	10.00	24.00	34.00	3.03	6.76	9.78	4.00	0.50	0.59	2245.49	0.02	0.07
Turnus' Troops	0.66	3.00	0.00	3.00	1.28	0.00	1.28	0.00	0.00	0.00	0.00	0.01	0.00
Vates Latinorum	0.03	0.00	1.00	1.00	0.00	0.06	0.06	6.00	0.26	0.28	0.00	0.00	0.00
Venulus	1.17	1.00	1.00	2.00	0.91	1.36	2.28	6.00	0.26	0.28	165.00	0.01	0.00
Venus	4.67	5.00	6.00	11.00	3.27	5.02	8.30	5.00	0.40	0.45	609.09	0.01	0.10
Volcens	0.11	1.00	2.00	3.00	0.13	0.09	0.21	6.00	0.28	0.30	2.00	0.00	0.00
Volusus	0.04	1.00	0.00	1.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
Vulcan	0.38	1.00	2.00	3.00	0.34	0.39	0.73	6.00	0.29	0.32	62.00	0.00	0.00
Winds	0.14	2.00	0.00	2.00	0.71	0.00	0.71	0.00	0.00	0.00	0.00	0.01	0.00

9 Annotated Bibliography

Agarwal, Apporv, Augusto Corvalan, Jacob Jensen, and Owen Rambow. "Social Network Analysis in *Alice in Wonderland*." In *Workshop on Computational Linguistics for Literature, Montréal, Canada, June 8, 2012*: 88-96.

This paper hand-annotates an edition of Lewis Carroll's *Alice in Wonderland* in order to analyze the use of different types of networks, i.e., static and dynamic networks, to show the function and role of characters in the novel. This paper is the first to use dynamic networks in order to avoid the over homogenizing of the text at hand. This paper is important because its networks are based on different types of social events (*interaction* and *observation*). It provides further options in analyzing the relationships in the works of Homer and Vergil and demonstrates how these social events can be used in determining perspective and in creating character sketches.

Alberich, R., J. Miro-Julia, and F. Rosselló. "Marvel Universe looks almost like a real social network." Preprint. http://arxiv.org/pdf/cond-mat/0202174.pdf.

This article uses "collaboration networks" in order to study the interactions of characters within the Marvel Universe and to decide if they are representative of real world interactions. This paper is important because it is the first to use social network analysis to analyze literature. Their network is static and based on co-occurrence relationships. Their paper is also important because it compares the results to real world situations, and it also compares the results to a "null random model." This model helps to determine if the results in the Marvel Universe are indicative or representative of the data available. The authors found that, though the Marvel Universe tries to mimic

human relations, there is still an artificiality to the network in terms of how the characters interact with one another.

Albert, Réka and Albert-László Barabási. "Statistical Mechanics of Complex Networks." *Reviews of Modern Physics* 74, no. 1 (2002): 47-97.

This paper systemically overviews complex networks, focusing on the statistical mechanics of network topology and dynamics. It rather importantly looks at real world results and in doing so demonstrates the real-world application of network theory. This paper is also important because it provides explanations for the mathematics underlying this network theory.

Alexander, Michael C. and James A. Dankowski. "Analysis of an Ancient Network: Personal Communication and the Study of Social Structure in a Past Society." *Social Networks* 12, no. 4 (December 1990): 313-335.

This article looks at 280 letters written by Cicero between 68 and 43 BC and applies social network analysis to study the relationships between senators and knights. This paper uses more quantitative methods to derive a more complete picture of the interactions between social classes. This paper is important because it is the earliest application of such theory to pieces of Classical literature and/or history. It also demonstrates the results of the calculations and methodologies and how the importance of these studies can be best communicated to Classicists rather than computer scientists, mathematicians, or sociologists.

Almas, Bridget, Alison Babeu, David Bamman, Federico Boschetti, Lisa Cerrato, Gregory Crane, Brian Fuchs, David Mimno, Bruce Robertson, and David Smith. "What Did We Do With A Million Books: Rediscovering the Greco-Ancient world and reinventing the Humanities." In White Paper

Submitted to the NEH, National Endowment for the Humanities, 2011. http://dl.tufts.edu/catalog/tufts:PB.001.001.00022.

This article looks at the goal of creating dynamic variorum editions, which allows readers to explore various versions of a text as well as to view the discourse occurring about certain portions of the text. The paper explores the issues of moving towards such a system and working with such a large quantity of text. This report is important because it addresses the problems that Classicists, in particular, face with the digitization of text.

Ardanuy, Marjona Coll and Caroline Sporleder. "Clustering of Novels Represented as Social Networks." *Linguistic Issues in Language Technology (LiLT)* 12 no. 4 (Oct. 2015): 1-28.

By representing relationships in novels as in both dynamic and static social networks, Ardanuy and Sproleder's article focuses on the possible use of character structure to determine the genre and style of an author. This paper is a comparative study between novels, and thus may proof helpful if comparisons are drawn directly between Homer and Vergil. It also provides insight by introducing the use of social network analysis in literature, defining dynamic and static social networks, and discussing the advantages and disadvantages of using conversational and co-occurrence networks. It also discusses the difficulties of coreferences, i.e., the different manners of address for the same person, a common problem for epics, which are populated with patronymics and epithets.

Bohannon, John. "Deciphering myths into legends." Accessed September 5, 2016. http://www.stuff.co.nz/science/7346191/Deciphering-myths-into-legends.

Published July 25, 2012, this article focuses on Carron and Kenna's article. Interestingly, they too tag on the fact that the authors also analyzed the Irish epic as well as *Beowulf* and the *Iliad*. This article pays particular attention to the fact that these stories are *myths* which may be based on real people and events and also draws attention to the lack of a control group in Carron and Kenna's study.

Borgatti, Stephen P., Martin G. Everett, and Jeffrey C. Johnson. *Analyzing Social Networks*. Los Angeles: Sage Publications Ltd., 2013.

As an introductory text, Borgatti, Everett, and Johnson offers an introduction to the mathematical foundations. They provide definitions for the elements of the network and categorize the different types of networks. The two types that they focus on are large networks and ego networks. This text is important because it helps to further corroborate the background information from Kadushin and Scott's texts. Moreover, the text provides more information on the visualization of graphs.

Carron, Pádraig Mac. "A Network Theoretic Approach to Comparative Mythology." PhD diss., Coventry University, 2014.

This dissertation by Pádraig Mac Carron studies how network theory can be applied to the study of comparative mythology. In chapter two, he provides an in-depth look at network theory, including key terms and calculations. In chapter three, he looks more specifically on social networks, and in chapter four, on mythological networks. In chapters five and six, he analyzes 33 different networks before comparing them. Using the metrics of network theory, he is able to further categorize and compare these mythological networks and thus provide new insight to the field of comparative

mythology. As an expansion of his work in conjunction with Ralph Kenna, this article provides important insight on the exact methodologies and calculations used in their more truncated articles.

Carron, Padraig Mac and Ralph Kenna. "If Achilles Used Facebook..." Accessed September 5, 2016. http://www.nytimes.com/2012/09/09/opinion/sunday/the-social-networks-of-myths.html?_r=0

Published September 8, 2012, this article, from the title onward, draws connections between the methods used by Carron and Kenna. This article specifically focuses on the Irish epic, though it seeks to draw attention through the name-dropping of Achilles. This article is important because it notes that Carron and Kenna's study does not replace traditional approaches but rather offers new perspectives and evidence.

Carron, Pádraig Mac and Ralph Kenna. "Universal Properties of Mythological Networks." *Europhysics Letters (EPL)* 99 (2012). DOI: 10.1209/0295-5075/99/28002.

This paper uses social network analysis in order to question Joseph Campbell's claim that mythological narratives share the same fundamental structure, i.e., the *monomyth*. Carron and Kenna's work is important because it is the first work to analyze the *Iliad* in this fashion as well as one of the first to use these strategies to compare literature. It compares the social network structure of four epics – *Beowulf,* the *Iliad*, and *Táin Bó Cuailnge* – and four fictional narratives – Hugo's *Les Misérables,* Shakespeare's *Richard III*, Tolkein's *Fellowship of the Ring*, and Rowling's *Harry Potter*. Through their analysis they found that these stories contain elements of real social networks. Specifically, for the *Iliad*, they found that Homer's work contained properties most similar to real social

networks. This argument corroborates the archaeological evidence that supports the historicity of some of the events in the *Iliad*.

Celikyilmaz, Asli, Dilek Hakkani-Tur, Hua He, Greg Kondrak, and Denilson Barbosa. "The Actor-Topic Model for Extracting Social Networks in Literary Narrative." *Proceedings of the NIPS 2010 Workshop – Machine Learning for Social Computing*.

Celikyilmaz et al. create a generative model for conversational dialogues. The actor-topic model (ACTM) allows for the unsupervised attribution of actors in social network from literature by attributing quotations to certain actors. They also attempt to draw connections in terms of topics between different speakers. Through this information, they plan to create social networks. While I do not plan to rely on the automatic attribution of texts, this demonstrates the evolution of distant reading and analysis of texts in terms of computational and social network analysis.

Cline, Diane Harris. "Six Degrees of Alexander: Social Network Analysis as a Tool for Ancient History." *Ancient History Bulletin* 26 (2012): 59-69.

In this paper, Diane Harris Cline discusses the use of Social Network Analysis (SNA) in the study of history. She first provides a survey of the history scholarship that utilizes these techniques and notes that, while the use of this methodology has been around since the early 1990s, its usages has largely gone unnoticed and applauded. She shows how she created three networks: the network surrounding Philip II of Macedon, the network of Pericles, and the network of Alexander the Great. Cline also makes the important connection to the field of prosopography. This is a brief review and introduction of SNA, meant to show its applicability and potential usefulness. As such, she does not delve

deeply into the mathematical foundations or the metrics involved with SNA; however, she does discuss the beneficial nature of the visualizations.

Cline, Diane H. "Social Network Analysis and Ancient History." Paper presented at annual meeting for the American Philological Association (APA), Chicago, Illinois, January 3, 2014.

After having heard this presentation at the 145th Annual Meeting of the APA, this paper was inspired me to first study the use of social network analysis with classical texts. This presentation presents an overview of how these techniques have been used in studying the Classics as well as Classical texts. Begun in May 2012, this project analyzes the social network revolving around Alexander the Great and 404 of his closest companions. She sorts these relationships in several different ways and uses these visualizations to analyze some of the main events in Alexander the Great's life.

Collins, Nick. "Beowulf and Iliad 'more plausible than Shakespeare.'" Accessed September 5, 2016. http://www.telegraph.co.uk/culture/9423516/Beowulf-and-Iliad-more-plausible-than-Shakespeare.html.

Published July 25, 2012, this article draws attention to *Beowulf* and the *Iliad* and succinctly demonstrates the claim of the article. This article is important for its brevity and for its ability to show the main points of the argument.

Crane, Gregory. "What Do You Do with a Million Books?" *D-Lib Magazine* 12, no. 3 (March 2006). Accessed December 7, 2015. http://www.dlib.org/dlib/march06/crane/03crane.html

Crane opens this article by first positing that it would take some forty lifetimes to read every volume in a single million book library. This factoid drives home the difficulty of

dealing with digital libraries. In this article, he advocates for the creation of not just digital libraries but intelligent digital libraries. He wants digital libraries to be mindful of six factors: (1) scale, (2) heterogeneity of content, (3) granularity of objects, (4) noise, (5) audience, and (6) collections and distributors. He then offers some suggestions for what can be feasibly done with a million books. This article is important because it places the Classics within the context of the digitized library.

Crane, Gregory, and David Smith. "Extracting Two Thousand Years of Latin from a Million Book Library." *Journal on Computing and Cultural Heritage*. 5.1.2 (2012) *ACM Digital Library.* Web. Nov. 25 2013.

This article considers large open digitization projects such as the Internet Archive and Google Books and the place that works of Classical relevance have within such collections. Crane and Smith work to extract works of note to academics and passerby in the field of Classics. This paper is important because it considers the importance of the Classics within the context of large text projects.

Elson, David K. and Kathleen R. McKeown. "Automatic Attribution of Quoted Speech in Literary Narrative." In *Proceedings of the Twenty-Fourth Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence.* Atlanta, Georgia, 2010.

I do not intend to write or utilize the code necessary for the automatic attribution of quoted speech by a computer, in part, because the coding capabilities are beyond me and, in part, because the coding for Latin – and Greek especially – are especially primitive at the moment. Because Greek utilizes a different alphabet and is more character based, computational analysis of Greek texts is significantly behind that of

Latin. Through Elson and McKeown's study, they were only able to achieve an 83% of accuracy in their quotations in English authors. Nevertheless, this article demonstrates the importance potential for such attribution in novels and pieces of like literature.

Elson, David K. and Kathleen R. McKeown. "Extending and Evaluating a Platform for Story Understanding." n Proceedings of the AAAI 2009 Spring Symposium on Intelligent Narrative Technologies II (2009), Stanford, CA, 32-35.

In this paper, the authors show the recent expansions to SCHEHERAZADE, "a platform for narrative intelligence that formally represents stories." They are attempting to build a new kind of corpus. Instead of the traditional collection of texts, SCHEHERAZADE intends to create a collection of story graphs. These graphs, which include nodes (characters) and arcs (actions), are reminiscent of social network graphs. Their extensions include widening the encoding – or sorting and labeling – of the novels so that there is a greater increase in its capability, though a margin of error still exists. This paper is of particular use to my paper because it shows the growing use of such graphs in the annotation and analysis of authors.

Elson, David K., Nicholas Dames, Kathleen R. McKeown. "Extracting Social Networks from Literary Fiction." In *Procedures of the 48th Annual Meeting of the Association for Computational Linguistics, Uppsala Sweden, July 11-16, 2010*: 138-147.

This paper surveys 60 nineteenth-century novels and serials from 31 different authors in order to evaluate social networks based on dialogue interactions. Elson et al. are the first to create social networks based on such criteria. They propose two hypotheses: (1) "that there is an inverse correlation between the amount of dialogue in a novel and the

number of characters" and (2) "that a significance difference in the nineteenth-century novel's representation of social interaction is geographical." This paper is important because it provides the basis for a possible evaluation of the works of Homer and Vergil based on conversations rather than by circumstance.

Emerging Technology from the airXiv. "The Remarkable Properties of Mythological Social Networks." Accessed September 5, 2016. https://www.technologyreview.com/s/516081/the-remarkable-properties-of-mythological-social-networks/.

Published on June 13, 2013, this article connects the work of Miranda, Baptista, de Souza Pinto, whose work on the *Odyssey* was based off Carron and Kenna's analysis of epics, to the social networks of Facebook, Twitter, and LinkedIn. It also makes an important connection o Stanley Milgram's study in the 1960s, which established the phrase "six degrees of separation." This article is important because it demonstrates how the topic can be explained to a wide audience.

Gil, Sebastian, Laney Kuenzel, and Caroline Suen. "Extraction and Analysis of Character Interaction Networks from Plays and Movies." Technical Report, Stanford University.

In this article, Gil, Kuenzel, and Suen combine the two approaches to literary analysis, i.e., qualitative and quantitative studies, to consider the character interaction networks that can be derived from modern plays and movies. This article first describes related work before discussing their methods in gathering data and extracting networks. While the analysis of their findings is interesting, the mathematical foundations of their

analysis is of greatest significance. The calculations form the basis for those done in the study of Vergil's *Aeneid*.

Highet, Gilbert. *The Speeches in Vergil's Aeneid*. Princeton, New Jersey: Princeton University Press, 1972.

In this book, Highet closely analyzes the speeches and speakers in Vergil's Aeneid. He does so by (1) looking at and defining the speeches and their speakers, (2) focusing on the "formal speeches," (3) focusing on the "informal speeches," (4) discussing the speakers and their models in other pieces of literature, and (5) considering Vergil as an orator as well as a poet. The second portion of his text is of the most import this paper as it defines the different types of speeches and locates them in the text of Vergil. Also of importance is his INDEX LOCORUM as he sorts the speeches by different categories. His categorization of the texts may provide further explanation for the mathematical analysis of the dialogue. While his references are used as the basis for the consideration of the speeches and dialogue in Vergil's Aeneid, these references are checked for accuracy.

Ioannis, Antoniou and Tsompa Eleni. "Statistical Analysis of Weighted Networks." *Discrete Dynamics in Nature and Society* (2008).

This paper provides a brief overview of the three defining the statistical parameters of networks: average path length, degree distribution, and clustering coefficient. Weighted networks are important because they help determine the different capacities or flows of information in links between nodes. It is important to be able to effectively measure these capacities. In its exploration of weighted networks, they look at the clustering

coefficient and its different definitions. They compared five different definitions and looked at the dependence weighted clustering coefficients on the weights by looking at the relative perturbation norm of the weighted network. This paper is important because it offers insight on the growing emphasis on weighted networks rather than unweighted networks and alternative avenues of calculating the clustering coefficient.

Jayannavar, Prashant Arun, Apporv Agarwal, Melody Ju, and Owen Rambow. "Validating Literary Theories Using Automatic Social Network Extraction." *Proceeds of NAACL-HLT Fourth Workshop on Computational Linguistics for Literature*. Denver, Colorado, June 4, 2015: 32-41.

This paper investigates whether theories about nineteenth century British novels are validated or contradicted by computational theories, specifically theory analysis. Before advocating "distant reading," this paper first analyzes the literary theories at hand before testing to see if computational analysis validates such things. Specifically, they looked at the role of urban and rural settings on relationships. This paper is important because it builds upon Elson et al.'s previous work and demonstrates the depth of analysis possible.

Kadushin, Charles. *Understanding Social Networks: Theories, Concepts, and Findings.* Oxford: Oxford University Press, 2012.

Kadushin's text acts as an introduction to the theories underlying social network analysis. While it defines key terms, it looks more at explaining why these methods

matter rather than the mathematical foundations. Kadushin also places the theories and concepts within a greater context by considering how social networks affect social interactions. The latter portion of the book and its focus on small worlds and network influences is of particular interest and note for the course of this paper. Kadushin's work will help to place a greater sense of meaning to the visualizations and calculations.

Kenna, Ralph and Pádraig Mac Carron. "A Networks Approach to Mythological Epics." In *Maths Meets Myths: Quantitative Approaches to Ancient Narratives,* edited by Ralph Kenna, Máirín MacCarron and Pádraig MacCarron. Cham, Switzerland: Springer International Publishing, 2017.

In this chapter, Ralph Kenna and Pádraig Mac Carron, in a more expanded form than their original academic article, write about how by quantitatively comparing structural properties of myths, new comparisons and observations can be made. They provide a brief introduction to network theory as well as the elements of complex network analysis necessary for comparison. In this article, they continue to study the Greek *Iliad*, the Anglo-Saxon *Beowulf,* the Irish Táin Bó Cúailnge, but they also add the Icelandic *Njáls saga* to their study. This essay is particularly useful in their discussion of the results asw well as the background information provided for each of these four epics.

Kenna, Ralph and Pádraig Mac Carron. "Math Meets Myths: Network Investigations of Ancient Narratives." *Journal of Physics: Conference Series* 681 (2016): 1-12. Accessed April 16,2 017. Doi: 10.1088/1742-6596/681/1/012002.

In this article, Kenna and Carron revisit their initial forays into the use of statistical physics and network theory on comparative mythology. This article, in particular,

focuses on Irish epic and on the *Táin Bó Cúailnge* (Cattle Raid of Cooley), the most famous epic of Irish mythology. First they provide a discussion of the Táin and by contextualizing it, demonstrate how these methods can be applied. They then look at metrics that can demonstrate if the relationships in the epic are representative of those in real life. The results are then compared to Homer's *Iliad* and the Old English epic, *Beowulf*. This visitation of their initial work provides an extremely helpful description of how network theory can be used to study the relationships in the epic.

Kydros, Dimitrios, Panagiotis Notopoulos, and Georgios Exarchos. "Homer's Iliad – A Social Network Analytic Approach." *International Journal of Humanities and Art Computing* 9 no. 1 (2015): 115-132.

Following in the steps presented by MacCarron and Kenna, this paper uses social network analysis in order to analyze Homer's *Iliad*. It first discusses the formation of the network, the topological network analysis, structural and grouping analysis, and then a section on the final results. Kydros et al. introduce the important concept that some nodes ought to represent groups of people such as the Amazons and that nodes can be partitioned into different groups (Greeks, Trojans, Gods, and Others). Their network is static and based on co-occurrence relationships, where "corresponding actors *interact* in some way" (118). This paper is important because it demonstrates the way in which social network analysis has been applied to Classical literature as it provides information on the various actors in the epic.

Massey, Steven E. "Social network analysis of the biblical Moses." *Applied Network Science* 1, no. 3 (2016): 1-19.

In this article, Steven E. Massey studies the figure of biblical Moses in terms of the books of the Pentateuch: Genesis, Exodus, Leviticus, Numbers, and Deuteronomy. This article is interesting in the way in which it both explores whether or not the books in the Bible are capable of capturing the real-world characteristics of social relationships and explores the role of Moses and Yahweh. Though the metrics used are familiar, the combination of these research questions is unique to this article. This article is useful in its examination of these networks in this manner.

Meadows, David. "On the 'Plausibility' of the Iliad and Social Networks?" Accessed September 5, 2016. https://rogueclassicism.com/2012/07/25/on-the-plausibility-of-the-iliad-and-social-networks/.

Published July 25, 2012, this article was written by Classicists, David Meadows, and reflects on the sudden influx of articles, written regarding Carron and Kenna's study. Meadows argues that the article is based upon statistical calculations, which despite the claims of various articles, are rather beyond his understanding. Moreover, he criticizes the oversimplification of Carron and Kenna's study in these articles and what such claims by those outside of academia mean for those inside the bubble.

Miranda, P.J., M.S. Baptista, and S.E. de Souza Pinto. "Analysis of communities in a mythological social network." Preprint. http://arxiv.org/abs/1306.2537.

Based upon Carron and Kenna's original paper on the use of social network analysis in literature, this paper analyzes Homer's *Odyssey.* The topological quantities collected help to classify the relationships in the *Odyssey* as real or fictional. His study uses a static social network, which is based on co-occurrence rather than conversational

relationships. This paper is useful in that it demonstrates how such analytical techniques have been used in Classical Studies – though not by Classicists, as evidenced by their reliance on translations.

Moreno, Jacob L. *Who Shall Survive? A new Approach to the Problem of Human Interrelations.* Washington D.C.: Nervous and Mental Disease Publishing, 1934.

This book published by Jacob Moreno provides the foundations for the application of graph theory to human relationships. Moreover, he created the field of sociometry, a quantitative method for measuring social relationships. He looks at how sociometry can be used in relation to psychology, sociology, anthropology, and economics. In this book, he created the sociogram, which is a way to graphically represent individuals as nodes and relationships as links. As such a pivotal work, Moreno's piece was worth briefly surveying in order to understand the origins of this application of network and graph theory.

Moretti, Franco. "Network Theory, Plot Analysis." *New Left Review* no. 68 (2011): 80-102.

This article provides an introduction to network theory and describes it as a way to quantify plot, create models, and visualize information about a story's plot. His analysis relies on explicit connections, based on the entirety of a piece of literature when he looks at Shakespeare's *Hamlet* and on parts when he looks at *The Story of the Stone*. He also lays out some three of the positive repercussions for this approach. Such network analysis keeps readers mindful of the past, creates specific character "regions" within the plot, and allows for the reduction and abstraction required for the creation of

models. This article is important because it lays out some of the important reasons for network analysis.

Park, Geyong-Mi, Sung-Hwan Kim, Hye-Reon Hwang, and Hwan-Gue Cho. "Complex System Analysis of Social Networks Extracted from Literary Fictions." *International Journal of Machine Learning and Computing* 3 no. 1 (Feb. 2013): 107-111. DOI: 10.7763/IJMLC.2013.V3.282.

This paper intends to analyze the characters in novels and to calculate the "distance" of these characters in the text. By doing such a study, they hope to determine more objectively the importance of fiction characters. This work is important because it provides the actual mathematical calculations used to consider the distance between individuals and the hierarchal structure of the networks at hand. It is also important because it takes into account the weight or significance of the relationships.

Ryberg-Cox, Jeff. "Social Networks and the Language of Greek Tragedy." *Journal of the Chicago Colloquium on the Digital Humanities and Computer Science* 1, no. 3 (2011): 1-11.

This paper uses texts from the Perseus Digital Library in order to create a comparative study of the relationships between characters in works of Greek tragedy. This paper is important because it hopes to bridge the gap between the modern distance reading approach and the close reading approach. They found four different types of social networks since the number of players in a Greek tragedy is limited in nature. Ryberg-Cox's paper is furher important because he touches upon the importance of visualizations in the reading of Classical texts as well as the possibilities of integrating text and language into the construction of the relationships.

Sack, Graham. "Character Networks for Narrative Generation." *Intelligent Narrative Technologies: Papers form the 2012 AIIDE Workshop:* 38- 43.

In this paper, Graham Sack proposes the use of social networks as an AI (artificial intelligence) narrative generation mechanism. He first looks at the relationship between character networks and narrative structures by constructing three networks of characters in 19th Century British fiction. He looks at co-occurrence networks in Charles Dickens' *The Pickwick Papers,* George Eliot's *Middlemarch*, and Henry James' *The Ambassadors*. He refers to these networks as "descriptive" as they show what happen "after the fact" as they show what narrative events take place. His analysis of the meaning of various factors – the graph density, the amount of isolates, and the clustering coefficient – is of particular help as he dwells less on the calculation of these numbers and more on the significance of the results. In the second portion of his paper, he looks at "generative" networks and looks at characters "before the fact" to explore why events happen. In particular, he looks at ideas from ""structural balance theory" and using this theory, he creates a kind of "proto-narrative" based on the evolving relationships of characters and he shows what happened leading up to a specific event.

Science 2.0. "What the Iliad Can Tell Us About Science 2.0 And Networks." Accessed September 5, 2016.

http://www.science20.com/news_articles/what_iliad_can_tell_us_about_science_20_and_networks-92450.

Published July 25, 2012, this article focuses on the way in which, for once, scientists are "butting into" the work of humanists, rather than the other way around. This article is

important because it is a nice synthesis of the work of Carron and Kenna and because it demonstrates how widely their work was shared.

Scott, John. *Social Network Analysis: A Handbook*. 2nd ed. London: Sage Publications, 2000.

Scott's *Social Network Analysis* is, as the eponymous title suggests, one of the seminal introductory texts on its topic. It provides insight on the development of the analysis as well as the main elements of graph theory. It also provides crucial definitions for terms such as density and centrality. As such, this text proves as a crucial text in providing necessary background information on the methodologies, which intend to be used throughout the course of this paper.

Stiller, James and Matthew Hudson. "Weak Links and Scene Cliques within the Small World of Shakespeare." *Journal of Cultural and Evolutionary Psychology* 3 no. 1 (2005): 57-73.

This paper builds off the article published by Stiller, Nettle, and Dunbar in 2003 and analyzes the value of weak links in the world of Shakespeare. They maintain the same argument that "the success of an audience's interaction with a dramatic performance ultimately depends on the accurate mimesis of natural human social groups within the diegetic world" (60). They analyze the presence of weak links in 10 Shakespearean plays. They no longer focus on static networks but instead look at dynamic networks, which are discerned in the different scenes of the play and which were reliant on dialogue interactions between characters. This paper is important because it causes need to consider if Homer and Vergil use the same small world networks to the same end, i.e., allowing for the easy conversation between author and listener/reader.

Stiller, James, Daniel Nettle, and Robin I. M. Dunbar. "The Small World of Shakespeare's Plays." *Human Nature* 14 no. 4 (2003): 397-408.

Stiller, Nettle, and Dunbar apply social network analysis to the many plays of Shakespeare. They argue that dramas depend on people's ability to follow how others relate to one another, and in order for people to understand best these relationships, it is important that dramas mirror real live alliances, kinships, and social groups. They study static networks, confined to each play. Their points for comparison are small world networks found in hunter-gatherer camps. They found that Shakespeare's dramas had "small world properties" and that as the number of characters increased, the number of cliques – of groups of friends – increased. This article is important because its argument is less reliant on whether or not Shakespeare's plays are based in fact but is more determined to consider how these real-life relationships impact the reader's understanding of the text and how the text moves its readers.

Shurkin, Joel. "Using Social Networks to Analyze the Classics." Accessed September 5, 2016. https://www.insidescience.org/news/using-social-networks-analyze-classics

Published on July 24, 2012, this article is arguably the first in a series to publicize the use of social network analysis on classical novels, i.e., the article by Mac Carron and Kenna. The article acknowledges that those leading the study are applied physicists and not humanities academics and that this this type of study is still controversial amongst humanists.

Sutherland, John. "Beowulf, Shakespeare and the plausibility of fiction." Accessed September 5, 2016. https://www.theguardian.com/commentisfree/2012/jul/25/beowulf-shakespeare-plausible-fiction?newsfeed=true#comment-17351783.

This article, published on July 25, 2012, takes note of the "silly season flutter in the newspapers" caused by Carron and Kenna's article. They claim that it is because the article is a bit more accessible than most. While they do not deny the validity of the findings, they take care to note that "Physicists and mathematicians, we may conclude, are as at sea with great literature as most of the rest of us would be with Antisotrophy, Vortex Clusters, and their Dynamics." This article is so important because it interestingly notes the skepticism directed towards the value of the study of literature in this fashion as it ends "I think, for the reason, that Carron and Kenna may be on something. But you don't need a PhD in maths [sic] to work it out. A love of literature will do it."

Toivonen, Riitta, Jussi M. Kumpula, Jari Saramäki, Jukka-Pekka Onnela, János Kertész, and Kimmo Kaski. "The role of edge weights in social networks: modeling structure and dynamics." *Noise and Stchastics in Complex Systems and Finance*, vol. 6601, no. 1 (2007): B1-B8.

This structure examines the importance of edge weights in social networks whose structure influences human interaction and community. Links between individuals can be either strong or weak. This paper looks at how a social network is constructed with weighted links and the effect that the weight of the links has on other networks. These weighted links are important because they lend to a greater understanding of the relationships in the *Aeneid*.

Wang, Xaio Fan and Guanrong Chen. "Complex Networks: Small-World, Scale-Free and Beyond." *IEEE Circuits and Systems Magazine* First Quarter 2003: 6-20.

In this paper, the authors provides an introduction to the basic concepts, processes, and important results in the study of complex networks. The basic concepts of average path length, the clustering coefficient, and degree distributions are explained in great detail before these concepts are applied to complex network models. Complex networks tend to be small-world and scale-free. Wang and Chen lay out several types of models: regular coupled networks, nearest-neighbor coupled networks, random networks, and scale-free models or exponential networks. They also note seminal authors and their small-world network models, including Watts and Strogatz, Newman and Watts, and Barabási and Albert. They then overview real-world examples of complex networks such as the AIDS propagation and blackouts of electric transmission. They end their paper by discussing the importance of robustness and fragility in the dynamical synchronization of complex networks. In plain speak, they look at the removal of certain nodes in a network and judging how the networks and other nodes are affected in turn. In total, this paper provides an important overview of complex networks and what that means, and as an overview of this specific topic, this paper is important to the analysis of my paper.

Wasserman, Stanley and Katherine Faust. *Social Network Analysis: Methods and Applications.* Cambridge: Cambridge University Press, 1994.

Wasserman and Faust's text, while introductory, delves far deeper as an overview of social network analysis. They look at networks, relations, and structure; mathematical

representations of social networks; structural and locational properties; roles and positions; dyadic and triadic methods; statistical dyadic interaction models; and the future direction of analysis. It gives the necessary background information and definitions before delving into the application of these theories. They discuss these topics in far greater detail. As such, their text acts a good follow-up text for Scott, Kadushin, and Borgatti et al.'s texts. They allow for the further analysis of the use of these methods in the articles, where an understanding of these methods is taken for granted.

10. Reflection

This project was first conceived in the January of 2014. I had the opportunity to attend my first meeting of the Society for Classical Studies, then the American Philological Association. I eagerly attended the only panel on digital classics. There I was deeply moved by a presentation, entitled "Social Network Analysis and Ancient History", by Diane Cline. Through the basic application of social network analysis, she was able to better visualize the relationships of figures such as Perseus and Alexander the Great. Most notably, she mentioned a key paper by Carron MacCarron and guy on the application of this work to Homer's *Iliad* and other epics. Though different from the concepts of corpus linguistics that I had learned about in the summer of 2013 during the Summer Opportunities for Intellectual Activity (SOfIA), this approach to the study of antiquity had the same blend of quantitative and qualitative analysis. This approach possessed the same blend of mathematics and humanities, which I had so admired in the senior thesis of Matthew Katsenes MC'04, "From Infinity to Improbability and Back Again: An investigation of the classical foundations of the calculus." However, this idea to analyze the *Aeneid* lay dormant for three years due to my rigorous research schedule and because of the gargantuan amount of time attached to such an analysis of a text.

Though we originally discussed working with Caesar and the *Anabasis*, I privately wished to return once more to where I began my research journey at Monmouth College. I wished to return once more to exploring the interdisciplinary nature of mathematics and classical studies – following in the footsteps of Matt, in this instance, certainly had not led me astray. I spent the summer of 2016 wading through Vergil's *Aeneid* via the translation of Stanley Lombardo as I had never fully read the text. I also began to annotate the text and tentatively explore the

relationship structures, though this was difficult to do without knowing precisely the sorts of information that was needed for the calculations and for the foundations of the math.

While I originally set out to analyze not only Vergil's *Aeneid* but also Homer's *Iliad* and *Odyssey*, I quickly realized my over ambitiousness in light of my other conferences over the course of the school year. As I began to read through the scholarly literature on the application of these studies during the fall semester, I realized that classicists, for the most part, had only grazed the surface of social network analysis by focusing on the visualizations. The mathematics underlying these images had been, for the most part, left to the wayside! I felt that the quantitative analysis of the text held something more than merely the figures that would be created. Therefore, I focused much of my energy not only on the reading of this text and the data entry but also on learning the mathematical foundations of social network analysis.

I am no mathematician (– least of all at the same level as Matt). Because of this deficit, I spent a large part of the end of the fall semester and the beginning half of the semester, reading through texts pertaining to graph theory and network theory. I also had to do a lot of cross-comparison of texts as the variables in these equations were not at all uniform. This knowledge gave me a greater understanding of the articles that I had originally read about the application of social analysis to literature. With this knowledge in hand, I then had to return to these key articles, and the many mathematical nuances became far clearer to me. Because of this understanding of the math, I had to reanalyze the text of the *Aeneid* and make the categorization of the relationships more uniform and thus make the data less dirty. This then led me to have to enter the data and to then re-enter it again in a different format so that it could probably be read by the gprogram, Gephi, which was used to produce the visualizations

and many of the calculations. I also had to clarify the questions that I was asking of the text to narrow down what calculations I had to perform. During this time, I also made great strides in terms of my understanding of the varied application of Gephi as well as Microsoft Excel.

Following all of this work, I then had to set about writing the actual paper. The drafts from my submissions to the Eta Sigma Phi panel at the Society for Classical Studies and to the Classical Association of the North East proved particularly useful to me as did the comments that I received from the meeting at CANE. Following advice from Dr. Sienkewicz on my very first research paper, I then set a firm outline to guide the construction of my paper. Recognizing that the mathematics involved with this paper were geared towards an audience geared more towards classics than mathematics, I went to great lengths to make sure that the structure was clear and the definitions throughout the paper were clear. I first did the background and literature review before focusing on the equations. The calculations and the evaluation of these numbers took the greatest amount of time and effort. During these initial drafts, Matt was of great help in terms of his mathematical expertise as he had a reasonably decent understanding of both aspects of the paper.

I very much viewed this paper as the culmination of my research here at Monmouth College. This project was very extensive and, perhaps, with a less rigorous research schedule, it could have been completed in a more timely and thorough manner. Overall, however, I have gained a greater understanding of social network analysis as well as the mathematics underlying this methodology, and I have also gained valuable experience analyzing data through Gephi and through Microsoft Excel. I have also gained a more intimate relationship

with Vergil's *Aeneid* as I now know not only the plot but also the characters with far greater facility and depth than I did before this research project.

In writing this reflection and considering what I had learned, I thought back to when I wrote my very first research paper here at Monmouth. Since that paper, I have become far better at not only reading academic articles but also in finding further sources to support and explain my research. I have honed my ability to find articles through resources such as a key book's bibliography and Google Scholar, to skim them to judge their usefulness, and to read them thoroughly to glean information from them. I have become better at finding convincing research questions to explore and also at narrowing the realm of focus as so many conclusions can be reached through such quantitative analysis as I like to pursue.

Though I got frustrated at the end of the process, I also realized, upon reflection, how much my endurance had increased over the years. I used to get frustrated like this far earlier in the process. The paper would also go off the deep-end much sooner as on my very first research paper, Matt was quick to point out where I lost steam... at only page 6. For my last major project on Eutropius and digital texts, Matt pointed out again where I started to lose steam and that was then somewhere around page 30. While my endurance is not quite up to writing a doctoral thesis, it has gotten better over the years as has my overall writing style, though, as you noted, I still struggle with making conclusions that would be pleasing not just to mathematicians but to classicists. Overall, however, I am satisfied with this project, and I feel more comfortable with taking on a project of such a great magnitude again in the future. I have learned a lot about the value of interdisciplinary studies and research that I am sure will benefit me in the future.

MONMOUTH
COLLEGE

Dr. Thomas J. Sienkewicz
Minnie Billings Capron Professor of Classics
Monmouth College
700 East Broadway
Monmouth, Illinois 61462
(309) 457-2371 OFFICE
(815)-346-2565 FAX
tjsienkewicz@monmouthcollege.edu
http://department.monm.edu/academic/classics

May 10, 2017

Evaluation of Emma Vanderpool's Senior Project on Facebook-ing Vergil's *Aeneid*

The bibliography generated for this project provides an excellent introduction to the study of social networking and the ways that computer studies have enhanced the examination of such networks in a variety of areas, from Homer to *Beowolf* to Harry Potter. The annotations themselves are thorough and very informative and make the bibliography a valuable resource for anyone interested in applying social networking tools to a literary topic. Missing from this bibliography, however, are studies of Vergil which might have provided some insight into how classical scholars have viewed interpersonal relationships in the *Aeneid* without the benefit of such tools. An examination of such literature might provide an excellent way to take this project to a next step.

The project itself demonstrates the benefits of social networking tools to the study of a work like the *Aeneid*. The statistical studies which are the foundation of this project clearly reflect a great deal of work in gathering linguistic data and in applying appropriate mathematical formulae to this data. The many charts incorporated into this study would be valuable pedagogical tools for any teacher of Vergil and would be a first point of reference for any future scholar working on social networking in other literary works. An interesting follow-up to this study of the *Aeneid*, in fact, might be a comparison of social networking in the *Aeneid* to the interpersonal relationships Vergil creates in the *Eclogues*. I would suspect that such relationships would prove much less realistic than those developed in the *Aeneid*, but such a suspicion requires careful examination of the texts.

One wonders what Vergil himself would think of this application of social networking to his epic and the extent to which the author himself was conscious of the need to create realistic social networks for his characters. This study suggests, indeed, that such networking was very much in the back of Vergil's mind as he told Aeneas' story. I suspect, in fact, that his networking was even broader than that presented in the *Aeneid* itself. Vergil's network certainly included his contemporary Roman audience in general, and Augustus and his circle in particular. Another way to advance this study would be to examine those parts of the *Aeneid* which evoke those networks and link Vergil's hero to Augustus and his contemporaries.

The personal reflection appended to this project is an important articulation of the intellectual and interpersonal journey which this study represents. The project itself is the result of important social networking on the part of the author, incorporating her work with high school mentors like Matthew Katsenes and Matthew Albert and with Monmouth College professors like Logan Mayfield and Anne Mamary. It is clearly also the result of her networking with other scholars, like Diane Cline, at professional classical meetings. It should also be noted, however, that CANE stands for the Classical Association of New England, not, as the author suggests in her personal reflection, the Classical Association of the North East.

At the same time, the project is clearly a personal journey by the author, one which enabled her to combine her love for Latin with her fascination with mathematics and to focus, as the culmination of her undergraduate study, on the major poet of the Roman world, and to provide a fresh look at a seminal literary work in Western literature.

While this study has already been shared at several professional classical meetings, it is my hope and expectation that this project will not be left forgotten somewhere in a computer folder but will eventually be submitted for publication in a scholarly journal so that others can benefit from all the work this project represents.

In sum, this paper is the product of an outstanding senior project. The author's labors have been long and difficult but have proven successful. *Tantae molis erat Romanam condere gentem!* (*Aeneid* I.33). It is clearly the work of an accomplished scholar and Classicist and is worthy of a grade of A.

Si vales, valeo.

Thomas J. Sienkewicz

Thomas J. Sienkewicz
Minnie Billings Capron Professor of Classics