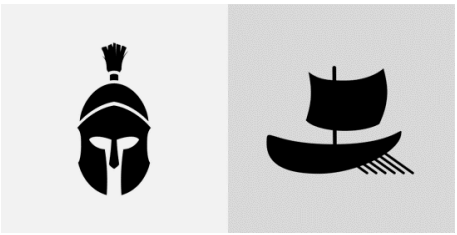

‘Minds’ in ‘Homer’: A quantitative psycholinguistic comparison of the *Iliad* and *Odyssey*; or, lexical frequency analyses of Homeric *noos* (νόος), *thymos* (θυμός), *psykhe* (ψυχή), *phrenes* (φρένες), *prapides* (πρᾰπῐ́δες), *kardia* (κᾰρδῐ́ᾱ), *kradie* (κρᾰδῐ́η), *ker* (κῆρ), and *etor* (ἦτορ), in contrast to alleged English-equivalents amongst seventeen dual-work translators

Including twenty visual aids and thirteen comprehensive data tables

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The following study was originally submitted to Dr. Edward Bernat in December 2019 in order to satisfy the requirements for a Bachelor of Science diploma in Psychology from the University of Maryland, College Park (College Park, MD). Since that time, this study’s data and scope have been expanded.

Abstract

“My child, why do you weep? What grief has come upon your *phrenes* (φρένες)? Speak—conceal not in *noos* (νόος) in order that we both may know,” so speaks Achilles’ mother Thetis as the fierce warrior weeps tears of wrath on the beaches of Troy (*Il.* 1.362-363). To be sure, *noos* likely translates as *mind* in English in the above passage. However, Homer’s *Iliad* and *Odyssey* include a total of eight such words that may be rendered as *mind*, *heart*, or *spirit*: *noos* (νόος), *thymos* (θυμός), *psykhe* (ψυχή), *phrenes* (φρένες), *prapides* (πρᾰπῐ́δες), *kardia* (κᾰρδῐ́ᾱ), *kradie* (κρᾰδῐ́η), *ker* (κῆρ), and *etor* (ἦτορ). This complicated situation with Greek translations of *mind* is at the heart of this study’s empirical investigation. To wit, what is *mind* in the *Il.* compared to the *Od.*? The present investigation sought to quantify and compare the use of mental language in the Homeric epics by means of computational linguistics. Prior scholarly investigations have been mostly qualitative; the few quantitative studies conducted utilized miniscule sample sizes of English translations. Two studies were conducted. 17 translators who translated both the *Il.* and *Od.* into English were selected (within-subjects design). The texts were sanitized and compiled for lexical frequency analyses in *Voyant*, a digital linguistic analysis tool. Study 1 compared how often mental language terms appeared in both works. Results showed that total word density of mental language increased significantly from the *Il.* to the *Od.* in both English translations as well as in the original Greek version. Study 2 compiled an English glossary of mental language terms and counted the frequencies for the 34 total works. A paired-samples *t*-test was conducted to compare the mean mental language densities of the *Il.* and *Od.* across 17 translators. There was a significant difference in the mean densities for the *Il.* (M = 68.2, SD = 8.9) and *Od.* (M = 91.9, SD = 11.6) conditions; $t(16) = -17.798$, $N = 17$, $p < .001$, $d = -4.317$. Further correlational tests as well as ANCOVA were conducted in order to determine if various factors could explain the large effect size. No significant results were observed or relevant. All hypotheses were supported. These data suggest that the *Od.* contains much more mental language than the *Il.* Implications and limitations are discussed.

Keywords: *Iliad*, *Odyssey*, Homer, mental language, psycholinguistics, mind, computational linguistics

Θα επαινέσω μόνο τον άρχοντα της σοφίας

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‘Minds’ in ‘Homer’: A quantitative psycholinguistic comparison of the *Iliad* and *Odyssey*

The object of this study is to quantify and compare the use of mental language in the Homeric epics known as the *Iliad* (*Il.*) and *Odyssey* (*Od.*). While many prior investigators have contributed to the study of Homeric psychology, most publications seem to be qualitative in nature. This study will utilize computational-linguistic analyses and methodological transparency, with the aim of helping address hitherto unresolved Homeric questions pertaining to dating, authorship, and composer psychology.

Why should anyone care about the use of mental language in the *Il.* and *Od.*? There is, in general, an unwarranted assumption within the fields of psychology and classical studies that the mentality of *Homo sapiens* has always been the same. This repugnant assumption has resulted in contemporary translators imposing modern psychological categories unto peoples removed from our time by some three thousand years. It is high time—I believe—for this assumption to stand the scrutiny of concerned scientific inquiry. The *Il.* and *Od.* are archaic cultural products oftentimes bundled into later periods of Greek achievement. However, these great works preceded the classical Greek culture that we think of today. In a period of some five hundred years, Aegean culture emerged out of the ruins and darkness of the Bronze Age collapse, bore witness to the amoral and divinely managed world of the *Il.*, inspired an oddly individualistic worldview in the *Od.*, all before embarking on one of the greatest societal breakthroughs in intellectual curiosity and achievement; achievement which, to be sure, is still illuminating our world to this day. Contemporary psychological theory has yet to provide a robust explanation for how and why illiterate Greek peoples were able to accomplish this gigantic leap in mentality within such a short period of time. For these reasons, among others, the present study regards the Homeric epics as psychological documents of immense importance for any general psychological theory of man himself.

The introduction is organized as follows. First, I will provide an overview of the *Il.* and *Od.*, their historical contexts, and Homer. Second, I will introduce the reader to contemporary notions of mental language through the words *mind*, *heart*, and *soul* before exhaustively listing prior empirical findings related to eight key Greek terms: *thymos* (θυμός), *phrenes* (φρένες), *kardia* (καρδία), *kradie* (κραδίη), *etor* (ἦτορ), *psykhe* (ψυχή), *prapides* (πρᾰπῐ́δες), and *noos* / *nous* (νόος). Third, I will briefly summarize prior theoretical approaches as well as a conceptually similar prior study. Fourth, I will describe my study’s computational-linguistic

approach, including its tools and methods. Finally, I will report the empirical results of two studies contained herein, explain their significance, discuss the implications, and outline possible future directions.

1. Introduction

The *Il.* and *Od.* are Homeric epic poems that were likely written down ca. 750 B.C.E. in an ancient Greek script (Powell, 1991, pp. 217-219; Altschuler et al., 2013). Each work contains 24 books, originally written in metered verse form known as dactylic hexameter. The *Il.* is roughly 16,000 lines long while the *Od.* is roughly 12,000. Authorship has been traditionally attributed to a single man named Homer. It is widely believed that the *Od.* is a narrative sequel to the *Il.* because they both temporally anchor their plots with respect to the alleged Trojan war in ca. 1183 B.C.E.

1.1. The *Iliad* and *Odyssey*

The first line of each epic explains what the story is about.[1]

1.1.1. *Iliad*. The *Il.* is mainly a war story concerning Achilles, a soldier fighting for the Greeks, during the last two weeks of the Trojan war, as told by the poem’s furious opening lines:[2]

> μῆνιν ἄειδε θεὰ Πηληϊάδεω Ἀχιλῆος οὐλομένην,
> ἣ μυρί᾽ Ἀχαιοῖς ἄλγε᾽ ἔθηκε
>
> Wrath, goddess, sing of Achilles Pēleus’s son’s calamitous wrath,
> which hit the Achaians with countless ills— (*Il.* 1.1-2)

Most of the epic is about Achilles’ rage and their consequences. Fierce battle scenes depict death, panic, and violence. Of the 318 deaths accounted for, 240 are named, 188 were Trojan and 52 were Greek (Garland, 1981, p. 43).[3] Achilles does not die in the *Il*. Scholars have noted that

---

[1] Much treatment (and scrutiny) has been given to a translator’s word selection for the opening lines of both epics, cf. Nikoletseas (2012).

[2] Unless otherwise noted, all Greek references are from Monro and Allen (1920) for the *Il.* and Murray (1919) for the *Od.* English translations are from Green (2015; 2018), respectively.

[3] See also Table 1 (pp. 52-53); Morrison (1999, p. 130) indicates that in 12 of these deaths, it is described as “darkness covered the eyes,” e.g.: “his first shot struck the boss of his horsehair-crested helmet and stuck in his forehead: right through into the bone the bronze spear point pierced. Darkness shrouded his eyes.” (*Il*. 4.459-461, Green, 2015, p. 91; underlined emphases added by the present author); Morrison (1999, p. 142), moreover, notes that S. E. Bassett (1938), *The poetry of Homer*, counts 318 killed and 243 named (p. 256, no. 37; the numerical

this story, thematically, is about revenge as well as Achilles’ destiny to live a short life of glory. Events are said to be the product of *divine machinery*, or constant intervention in human affairs by the Greek pantheon of deities (Burkert, 1985, p. 122f.).

1.1.2. *Odyssey*. The *Od.* concerns itself with wily Odysseus, who undergoes a ten-year naval journey to come home after the Trojan war, as we are told in its opening lines:

> ἄνδρα μοι ἔννεπε, μοῦσα, πολύτροπον, ὃς μάλα πολλὰ
> πλάγχθη, ἐπεὶ Τροίης ἱερὸν πτολίεθρον ἔπερσεν
>
> The man, Muse—tell me about that resourceful man, who wandered
> far and wide, when he’d sacked Troy’s sacred citadel (*Od.* 1.1-2)

Thereafter, it proceeds with detailing Odysseus’ perilous journey home to Ithaca, whereby he comes home to reunite with his wife and son. Odysseus is the only survivor of his original crew. Thematically, the *Od.* is said to be a story of identity, a celebration of deviousness, and the invention of guile itself—among other opinions (Jaynes, 1976, p. 273). Unlike the *Il.*, the *Od.* has been characterized as a story of a man who operates by means of his faculties, not fighting skills.

The opening lines of each epic, then, may be a qualitative indicator that the *Od.* is more plentiful than the *Il.* in its use of mental language. This *prima facie* presupposition is the basis of the present study’s attempt to linguistically compare the use of mental language in both works.

1.2. Homeric Chronology, Geography, and Authorship

1.2.1. Chronology. Chronologically, the generally agreed upon composition date of these works falls into the Archaic period of Greece (ca. 750-480 B.C.E.), which was in the Iron age (Whitley, 2001, p. 60f.). Evidence suggests that this was shortly after the development of the Greek alphabet in ca. 800 B.C.E (Powell, 1991, pp. 217-219). A computational analysis of cognacy rates between words of Hittite and Germanic origin supports this assertion, albeit with a 760-710 B.C.E. composition date (Altschuler et al., 2013). This period was almost 2,000 years after the great pyramids of Giza were built, over 700 years before Jesus emerged, and well before the formal Roman empire came to power. Additionally, there is little doubt among scholars that the *Il.* preceded the *Od.* (Powell, 1991; Rutherford, 1993; West, 1995, p. 216). This opinion has

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discrepancies seem negligible); for a tabular breakdown of all fatal injuries in the *Il.* and their concomitant anatomical location, see Morrison (1999, p. 143f.).

been supported by means of linguistic statistical analyses, which accounted for word usage and noun declension patterns among Greek authors in their respective ages (Janko, 1990, p. 329).

From ca. 750 B.C.E. and thereafter, the Homeric epics became part of a rich written tradition in Greece (Powell, 1991, p. 217). That is, in the ages prior, Greece was considered illiterate, as evidenced by no mention of writing by a man named Homer. Portions of the poems were chanted at the Great Panathenaea by ca. 500 B.C.E. As the Classical period of Greece (ca. 479-323 B.C.E.) emerged, the Homeric tradition and its epics were said to be as much a mystery to Aristotle (ca. 350 B.C.E.), Plato, and others, as us in the present century (Young, 2003, pp. 47-51). During the Classical and Hellenistic periods are when the manuscripts were said to be produced, although none of these survive to this day *in extenso*. As Young (2003, p. 176) meticulously documented, the first printed versions of Homer appeared in the 1400s, and hundreds were to follow through the present day.

1.2.2. Geography. The geographic areas referenced in these works are in Europe, Northern Africa, and Western Asia—mainly modern-day Greece and Turkey—all accessible via the Mediterranean Sea. Turkey was formerly known as the Ottoman empire and its landmass has been called Anatolia. Much of the *Od.* concerns naval travel, which includes the Aegean Sea, near Greece, as well as the Southern Mediterranean Sea.

1.2.3. Authorship. While authorship of these works is largely attributed to a single man named Homer, evidence suggests that these works were a shared oral tradition of storytelling by Greek peoples (Lord, 1960, pp. 3-12; Nagy, 1996, p. 13ff.).[4] A longstanding view was that the *Il.* and *Od.* were written by a single man—the former in his youth and the latter in old age. This viewpoint has been furiously debated on account of there being such little concrete evidence of Homer as a person (Young, 2003, p. 9). Instead, the favored qualitative opinion on the matter is that the works are a culmination of traditional narratives layered together by means of oral poetry, which is known as the Parry-Lord thesis (Lord, 1960). Others, however, retort that poems of such scope, complexity, and similarity could not be remembered, even with the aid of formulaic insertions.[5] Prior word frequency and discriminant validity analyses of the two works

[4] Nagy (1996) seems to be the staunchest supporter of this theory heretofore, see Nagy’s *curriculum vitae*, https://chs.harvard.edu/CHS/article/display/1503.

[5] Harris (2001, p. 73ff.) loosely suggests that literacy was more common and alludes to Homer as a single person in his general discussion.

suggested that while one person *may* have written the *Il.*, it is unlikely the same author wrote the *Od.* (Martindale & Tuffin, 1996).

1.3. Contextual Dating of the *Il.* and *Od.*

Composition dates aside, archaeological evidence of material and ritual culture referenced in these two works supports contextual dates of ca. 1700-1050 B.C.E. That is, textual evidence from the *Il.* and *Od.* correspond to material findings by archaeologists that may be approximately dated. Analyses by experts in art, linguistics, history, metallurgy, literature, and other fields suggest that the Homeric events loosely took place or resemble a much earlier period than the composition date. The lines of evidence in favor of a contextual date in the middle of the second millennium are thus: (i) archaeological remains of the mythical city of Troy; (ii) metallurgical references to bronze and iron; (iii) references to material and ritual culture; (iv) mythical references and linguistic conventions, and; (v) tertiary *ad hoc* considerations. Each is briefly taken up, in turn.

1.3.1. (i) Troy. Archaeological findings by Heinrich Schliemann (1875), Wilhelm Dörpfeld (1902), Carl W. Blegen (1937), and Manfred Korfmann (2004) seem to indicate that *Iliadic* Troy was a real place—Hisarlik, Turkey—and that a war took place there in ca. 1183 B.C.E. Moreover, the date corresponds to a well-documented and widespread societal collapse in the Ancient Near East (Cline, 2014, pp. 85ff.). The existence of a real Trojan war, a real Troy, a date of ca. 1200 B.C.E., and its relationship to the *Il.* seem to be accepted by scholars.

1.3.2. (ii) Bronze and Iron. Word frequencies of iron and bronze used in weapons and implements have been suggested to be indicative of a late Bronze Age (ca. 1200 B.C.E.) setting for the *Il.* David B. Monro (1901, p. 339) calculated that the *Il.* referenced iron 23 times and bronze 279 times, while the *Od.* counted 25 and 80, respectively. Ruth Russo (2005), a chemist, suggested that literary devices like similes and metaphors referencing iron (e.g., Achilles’ “heart of steel” in *Il*. 22.357) indicate a ninth century B.C.E. understanding of the kinds of iron available.[6] Despite this, most of her Homeric references are from the *Od.* and weapons are not cited as being made of iron. Moreover, Russo (2005, p. 28) indicated that her conclusions for the

[6] Russo’s argument was based on the core assumption that the similes and metaphors that ‘Homer’ used were conceptually targeting iron and steel in different stages of creation (e.g., smoldering, cooling, refined, layered with different oxides, etc.). This seems unpersuasive because it requires the presupposition that an unattested and illiterate poet would understand the complexity of metallurgy. Such a presupposition seems cavalier, even for literate contemporary individuals.

Il. were based on books that were later additions (the author mostly used references from books 1 and 22-24); however, Martindale’s (1996, pp. 118-119) statistical findings indicate that several of these books were likely late additions—particularly *Il.* 23-24—in agreement with Tyler (1894, p. ix), Kirk (1985, pp. 47-50), Casey Dué (2018), and others. Snodgrass’ (1971, pp. 217ff.) archaeological survey of the Dark Age of Greece noted that the eleventh century B.C.E. featured iron being used in the form of implements (e.g., knives), not weapons. Lang (1906) concurred with this assessment, noting that insufficient iron toolmaking methods resulted in soldiers being afraid to risk their lives by using ‘unproven’ metals. In any case, the evidence seems sufficient to assert that the metallurgy referenced in Homer alludes to a much earlier date than the composition of the works themselves.

1.3.3. (iii) Art, Arms, Clothing, and Burial Customs. References to material and ritual culture in the *Il.* have been said to be of seventeenth to tenth century B.C.E. origins. These lines of evidence include the nature, shape, and use of spears, military outfits, helmets, as well as artwork (Lang, 1906; Snodgrass, 1971; Hurwit, 1985; Powell, 1991, p. 187ff.; Morris, 1995; Dué, 2018). Particularly, the manners of burial described throughout the *Il.* reflect older Mycenaean cultural practices (Snodgrass, 1987; Powell, 1991, p. 196; Dué, 2018).

1.3.4. (iv) Language. The language of the oldest parts of the *Il.* and *Od.* are said to be of seventeenth to thirteenth century contents and origin. These lines of evidence include mythical contents, the metrical patterns of Homeric verse, and the etymological origins of the words from the Indo-European family of languages (Onians, 1951; Nagy, 1990; Powell, 1991; Rutherford, 1993, p. 49ff.; Hood, 1995; Nagy, 1996; Vico, 2002, pp. 159-160).

1.3.5. (v) Astronomers, Herodotus, and Others. Some *ad hoc* arguments for an earlier contextual date of the Homeric epics have been proposed. Astronomers Baikouzis and Magnasco (2008) speculated that a passage in *Od.* 20.356-357 referred to a total solar eclipse whose path passed through the Ionian islands on April 16, 1178 B.C.E. This assertion has been brought up by prior scholars and historical figures (like Heraclitus). Gainsford (2012) refuted the claim directly, and other classicists do not seem convinced. Powell (1991, p. 209) noted that the contents of the Homeric works are Bronze Age legends. Herodotus (2013) dated the Trojan war to ca. 1250 B.C.E. in his work, *The Histories*.

1.4. The Language of ‘Minds’ in ‘Homer’

In Homeric Greek, there is no single word for mind, soul, consciousness, or the seat of agency; instead, there are several mental or psychic objects that embody the function or location of cognition (Onians, 1951; Jaynes, 1976; Snell 1982; Clarke, 1999; Privitera, 2015; Zanker, 2019). The main terms associated with the modern notion of mental activity, either grammatically or behaviorally, are thus: *thymos* (θυμός), *phrenes* (φρένες), *kardia* (καρδία), *kradie* (κραδίη), *etor* (ἦτορ), *psykhe* (ψυχή), *prapides* (πρᾰπῐ́δες), and *noos / nous* (νόος).[7] Before proceeding, it must be noted that any prior attempt to clearly define or psychologically profile these terms consistently has been seen as futile. That is, these terms have no firm English-equivalents. As a result, any single definition or usage pattern profile may be easily refuted by numerous counterexamples.

In following Jaynes (1976), these mental objects will be referred to as *hypostases*. A *hypostasis* (Greek, sing.: ὑπόστασις) is the underlying essence of a thing, like a foundation or constitution. The Homeric mental objects aforementioned are generalized as *hypostases* because they are the core things or locations wherein, whereupon, wherewith, or whereunto mental activity takes place in the *Il.* and *Od*.[8] A more precise shorthand for grouping these terms, to be sure, would betray their plastic textual nature within the Homeric tradition, and therefore be injurious to the task at hand. Furthermore, generalizing these terms under an English term such as *psychic organs* would neglect the fact that the word *psychic*—which shares the same root word for psychology itself—derives its name from *psykhe* (ψυχή). However, this object is a hypostatic term of utmost importance for the present investigation, and one that scholarship is far from drawing concrete conclusions about. It is hence necessary to avoid the injurious exercise of including the term of interest in its own definition.

1.4.1. Contemporary Hypostases: *Mind*, *Heart*, and *Soul*. Readers unaware of Homeric hypostases may better understand the nature of these terms by first considering them in relation to contemporary notions of *mind*, *heart*, and *soul* (readers familiar with Homeric hypostases are

[7] Hereafter, *nous* and *noos* will be referred to as just *noos*, whilst acknowledging the different forms. These terms were selected in proximal agreement with Sullivan (1999, pp. 3, 162), Clarke (1999, pp. 53, 61), and Jaynes (1976, pp. 255-292).

[8] This approach also conceptually follows Sullivan’s (1999, p. 2f.) approach with respect to using a term that includes both psychological and physical features that are undifferentiated: “Psychic terms designate entities that comprise aspects of both ‘physical’ and ‘psychological’. We moderns separate categories as ‘concrete’ and ‘abstract,’ ‘physical’ and ‘psychological,’ whereas the early Greeks do not.”

encouraged to skip the section). To be sure, *mind*, *heart*, and *soul* are rich English words which stand for concepts that are not clearly defined or agreed upon in the context of this study. That is, the words stand for concepts not well understood. The literature in this area is also scant. Consequently, the brief descriptions outlined hereafter reflect the author’s own understanding, which must be taken with caution.

1.4.1.1. ***The Container Metaphor of Mind.*** In following Zanker (2019, p. 172) and Horn (2015; 2016), contemporary English speakers often associate mental activity with *mind* or *heart*. These uses are generally a container metaphor localized anatomically in the skull or chest, respectively, whereby mental space is an analog of physical space. Phrases like “out of my mind” and “take what I said to heart” are a few such container metaphors which designate mental activity (Zanker, 2019, p. 166). In truth, however, no physical motion and spatial separation takes place with respect to thinking.

The metaphorical uses of *mind* and *heart* may thus be understood as if these words are three-dimensional objects in physical time and space. As objects, they are hence subject to physical laws. It follows that the chief properties of *mind* and mental action may and ought to be characterized vis-à-vis properties of physical reality. These properties are mere extensions of what the container metaphor of *mind* is doing and what it can do. Combinations of such properties, then, must have clear and comprehensible meanings with respect to mental states. Some properties may be motion, placement, size, permeability, interiority, agentive independence, divisibility, etc. For example, consider the locative expressions in the following two examples of mental activity:[9]

> What’s on your **mind**?
> Speak from the bottom of my **heart**.

Verbs with motion apply as well, as considered below:

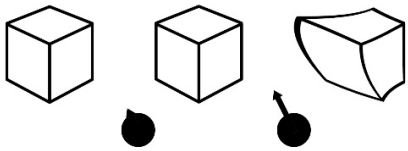
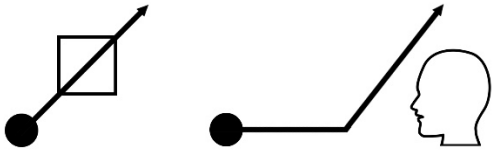
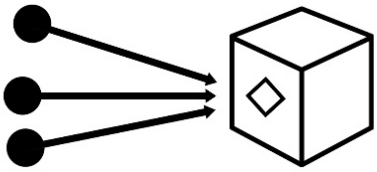
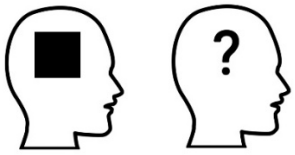
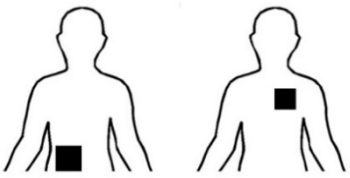
> The presentation **blew** my **mind** away.
> My **heart sank** as I watched.

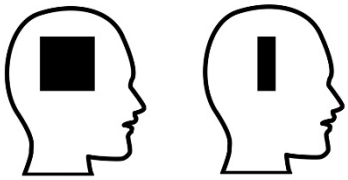
A brief inventory of these phrases and some visual aids may be observed in Figure 1. In sum, it is useful to consider contemporary notions of *mind* and *heart* as metaphoric container spaces.

[9] For locative expressions, their uses, problems, and applications, see esp. Herskovits (1985).

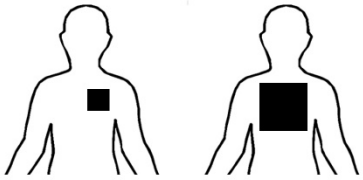
Figure 1

34 Contemporary English Phrases Involving Mind and Heart and 19 Diagrams

Property	Mind	Heart
	 (before) (during) (after)	
Motion Shape change	1. The ●experience was ■**mind**bending *Awe was experienced*	2. Her ■**heart** throbbed *She was nervous, anxious, or excited*
Motion Speed	3. She has a quick **mind** *She is intelligent*	4. Her **heart** is racing *She is anxious or excited*
Static Movable	5. New info changed her **mind** *She altered a previous belief with a new one*	6. Her **heart** was moved by his words *She exercised compassion*
	 (crossed) (went over)	
Static Collision	7. The ●idea crossed her ■**mind** *She conceived the idea before*	8. His ●words pierced her ■**heart** *She was emotionally distraught or sad*
Near collision	9. The ●idea went over her **head** *She did not understand the idea*	10. Her **heart** sank for a second. *Her initial emotional reaction was resolved*
	 (not lost) (lost)	 (wrong) (right)
Placement	11. She lost her ■**mind** *She is insane or acting insane*	12. Her ■**heart** is in the right place *She is compassionate or thoughtful*



(normal) (narrow)

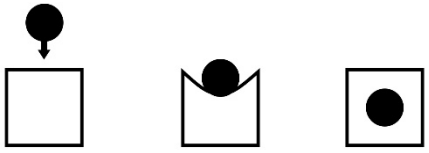


(small) (big)

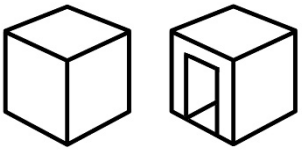
Size

13. She is narrow-**■minded**
She is stupid, stubborn, or arrogant

14. She has a big **■heart**
She is kind or compassionate



(out) (sinking) (in)



(closed) (open)

Exclusion
Permeability
Gating

15. ●It sunk in her **■mind**
She understood, learnt, or accepted it

16. Her **■heart** was open
She exercised compassion

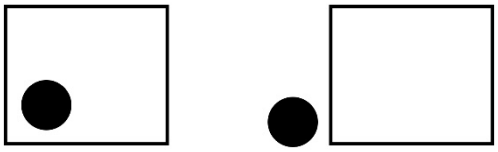
(in back) (in front) (at bottom)

(*cf. no. 15*)

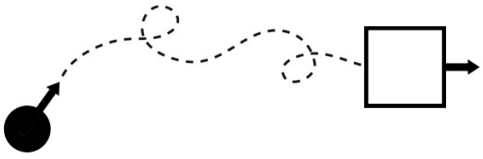
Interiority
+ Placement

17. ●It is in the back of her **■mind**
She may consider it

18. Do what (●thing) is in your **■heart**
Do as you desire



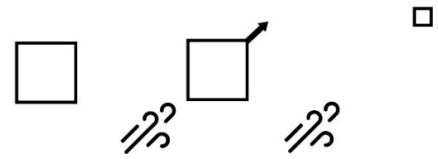
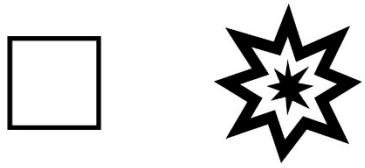
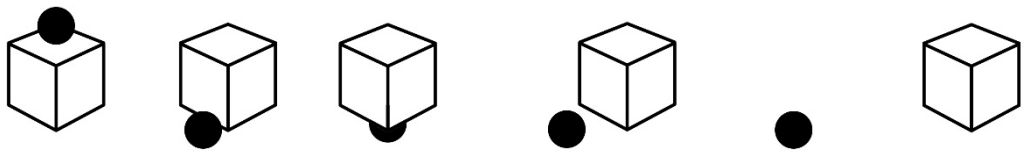
(in) (out)



Agentive independence

19. ●She is out of her **■mind**
Her behavior does not align with established behavioral expectancies

20. ●She followed her **■heart**
She acted based on her desire

		 (normal) (broken)
Divisibility	21. She is <u>of two ■■**minds**</u> about it *She is trying to decide*	22. Her **■heart** <u>is broken</u> *She is experiencing grief*
Temperature	23. She is a <u>hot**head**</u> *She is angry or has a temper*	24. She is **<u>cold-hearted</u>** *She is shrewd or unemotional*
Color	25. She has a <u>dark **mind**</u> *She is evil*	26. Her **<u>heart</u>** <u>is black</u> *She is evil, depressed, or apathetic*
Structural Decomposition	27. Her **<u>brain</u>** <u>is fried</u> *She has little energy for cognitive activities*	28. His words <u>melted her **heart**</u> *She responded emotionally*
Structural Integrity	29. She <u>made up her **mind**</u> *She made a decision*	30. She has a **<u>heart</u>** <u>of gold</u> *She is a good person*
	 (start) (blowing) (away)	
Structural Rapid shift	31. Her **■mind** <u>was blown</u> (up/away [?]) *She was shocked, amused, or surprised*	32. Her **■heart** ✷<u>exploded</u> *She was overjoyed*
	 (on) (adjacent) (under) (near) (far)	
Proximity Distance	33. What (●thing) is <u>on her **■mind**</u>? *What is she thinking about?*	34. ●It was <u>near and dear to her **■heart**</u> *She cared about it*

Note: Illustrations by Boban Dedović.

1.4.1.2. *The Spatialization of Subjectivity.* Because mind is an abstract concept, it follows, too, that other abstract concepts take on spatial qualities. For example, time is often referred to as “flowing” or moving “forward,” thus being distinctly marked with directionality (Buonomano, 2017, p. 179ff.; Zanker, 2019). However, time itself has no such spatial qualities of *side-by-side*-ness; nevertheless, spatial metaphors help us understand time and explain it to others. Like *time*, the contemporary terms *mind*, *heart*, and *soul* have also come to mean abstract concepts described with distinct spatial qualities. All this gets messy very quickly when *me* and *I* are added, as considered below:

> **I** look inside **myself** and see **my heart** is black (“Paint it Black [song],” *Rolling Stones*, 1966)

This well-known phrase includes “inside myself,” which is a reflexive personal pronoun prefaced by a simple locative preposition.[10] The problems here are legion: (1) who is looking; (2) what is being looked into; (3) what is the *heart*’s role, and; (4) where is *mind*? Some readers may answer that *soul* is the answer here. *Soul*, which is the third and final contemporary hypostasis of note to consider. Nevertheless, *soul* creates the problem at the heart of this phrase about *mind*: it has no simple anatomical association, thereby making it subjective. The subjectivity is a problem when concrete behavioral metaphors and locative expressions are the means by which these terms are discussed. In sum, subjective—non-material—things like *soul* and *time* are described and understood via spatial metaphors. This final point is generally where science departs such that there is no robust explanation.

Having reviewed the spatial nature of describing mental activity via container metaphors, the contemporary hypostases of *mind*, *heart*, and *soul* may be briefly taken up, in turn, in order to review their functions and qualities within the English language.

1.4.1.3. *The Mind’s “Eye.”* The contemporary *mind* hypostasis is oftentimes referred to as the anatomical brain, wherein intelligence is the function and metaphors of visual sense perception are the way to describe it. When referring to someone being smart, the quality is often described with words related to seeing and vision: “she is bright,” “I see it clearly,” and “I don’t see your point.” A former Latin instructor of mine once quipped that the best way to memorize declensions was to “get it down cold,” with the result of being able to “visualize it with your mind’s eye” at a later time. Here, memory was described via motion, temperature, and vision.

[10] For a study about how children acquire the capacity to use these terms, see Internicola and Weist (2003).

Despite its complexity, most readers probably inferred this metaphor with ease. These function as linguistic shortcuts, thereby reducing the number of words required to express meaning. It may be thus translated with annotations for the metaphoric elements:

> ***Metaphoric phrase*** → Get it down cold . . . visualize it with your mind’s eye.
>
> ***Non-metaphoric equivalent*** → Understand and memorize the contents required so firmly, such that it is in a locked position of restricted motion, unable to escape your sight and supervision, whereafter you may recall those contents without having to utilize external resources or stimuli, as if you are looking at it.

The latter phrase is wordy and literal; however, it generally has the same meaning as the former. Intelligence and mental activity may be equated to having a “mind’s eye” so that you can “see clearly,” despite the fact that the human brain does not contain a third oculus (Samuels & Samuels, 1975). Aside from the visio-spatial quality, the mind is often referred to as an agent in close relation to the concept of the self (i.e., *me*).[11] The mind, then, may be culturally identified as the seat of rational thought in the English language.

1.4.1.4. *The Paralogical Heart.* In comparison to the *mind*, the contemporary *heart* hypostasis may be considered an inferior container metaphor for pseudo-mental activity. Phrases like “do what’s in your heart” and “follow your heart” take on the spatial qualities of mind, albeit in a different anatomical location in the human body—near the right edge of the left breast. The heart may also represent will, love, and morality (e.g., “he won because he had the most heart,” “I love you with all my heart,” and “she has no heart,” respectively). However, the emotional connotation with the contemporary *heart* hypostasis is oftentimes seen as deficient in logical capacity. That is, it is paralogical—thus being subject to secondary mental activity classification in comparison to the *mind* and its metaphoric *eye*. The *heart* hypostasis, then, is more oriented towards being the seat of feelings, emotions, and courage.[12]

1.4.1.5. *The Immortal Soul.* Finally, the contemporary *soul* hypostasis varies according to a person’s given religious beliefs, but may be considered an abstract representation of the person’s true essence, independent of the body. This hypostasis is not usually associated with an

[11] See esp. Jeremiah (2010) for a *tour de force* treatment of reflexive personal pronouns in Homeric Greek.

[12] Biological men may sometimes be exposed to the concept of courage as being localized in the testicles or the gastrointestinal tract (e.g., “he has no balls” and “have some guts,” respectively). However, these are less common hypostatic container metaphors in comparison to the heart. These uses, moreover, may be considered vulgar.

anatomical location. While it has an important role in spirituality, religion, and personal beliefs, it is not usually related to mental activity such as thinking and logic.[13]

To summarize, contemporary English notions of *mind* and *heart* may be considered spatialized container metaphors wherein mental activity is said to take place, while the *soul* is an abstraction less associated with reasoning. This brief review of contemporary hypostases may seem self-evident; however, the exact nature of the language used to describe mental activity—with respect to location, agency, spatial quality, and relation to emotions—is incredibly important when trying to understand Homeric notions of mental language.

1.4.2. Homeric Hypostases. The Homeric hypostases that represent mental activity are similar to contemporary notions in that they are (usually) localized anatomically and spatialized. However, the hypostases used in the *Il.* and *Od.* differ in that many of them are usually pluralized grammatically, contextually described as physical sensations in or around the chest and midriff, and functionally correlated to life substances which can act as agents independent of the person (Onians, 1951; Jaynes, 1976; Darcus, 1977; Snell, 1982; Pelliccia, 1995; Privitera, 2015). In general, they are localized in the upper torso or chest area (Clarke, 1999, p. 73f.). These objects may function as container spaces, whereby precursors to action include language indicative of gases, liquids, and substances filling them (Clarke, 1999, p. 79f.). They may be referred to as abstract agents, physical organs, physical sensations, or locative references, among other uses. Time is referenced in concrete spatial terms (Austin, 1974, p. 224ff.). Thinking is often denoted as speaking, whereby a person may converse with a hypostasis directly (Onians, 1951, p. 13ff.). Verbs related to thinking and mental action generally require a description of physical motion (Clarke, 1999, p. 109f.) Note, again, that counterexamples may be <u>easily</u> identified for each hypostasis’ general overview. Each is taken up in turn.

1.4.2.1. *Thymos (*θυμός*).* *Thymos* is the most common hypostatic term in Homer and its simple definition may be *the seat of emotion*. It appears over 700 times in Homeric works (Sullivan, 1999, p. 121). According to Jones (1909, p. 100), it appears 759 times, always in the singular.

[13] More study is likely needed on the matter.

1. Definition: This untranslatable word is generally defined as meaning *heart*, *soul*, and *life* (Autenrieth, 1895, p. 140), or *soul*, *spirit*, and *feeling and thought* (LSJ, 1940, p. 810).[14]

2. Attribution: Humans, deities, and animals have *thymos* (Sullivan, 1999, p. 122).

3. Anatomy: *Thymos* is always anatomically located in the chest, oftentimes as the heart organ (Sullivan, 1999, p. 122).

4. Etymology: Scholars generally agree in the etymology of *thymos* (Lynch & Miles, 1980, p. 4; Clarke, 1999, p. 79). It may be derived from the Proto-Indo-European constructed word root **dhuh₂mós*, meaning *smoke*, or **dheuh$_x$*, meaning *to be in (com)motion,* or *rise (as dust or smoke)* (Mallory & Adams, pp. 388, 529).

> **4A.** Cognates: Relevant cognates may be Latin *fumus* and Sanskrit *dhumus*, both of which mean *smoke* or *to swirl* (Lynch & Miles, 1980, p. 4f.).
>
> **4B.** Greek: In Greek, *thymos* may be related to the verb *thuō* (θύω), which is translated as *raging*, *rushing*, or *violent motion* (Sullivan, 1999, p. 122), or *raging*, *seething*, and *eager desire* (LSJ, 1940, p. 813), or *that which moves* (Lynch & Miles, 1980, p. 5).

5. Grammatical features: Grammatically, *thymos* is always in the singular, even when referring to two separate people (Jones, 1909, p. 100; Sullivan, 1999, p. 121).[15]

> **5A.** Function: Its main grammatical function is as a causative independent agent within the person. That is, *thymos* or its invigoration can cause demonstrable behavioral outcomes whilst being referred to as a separate agent from the person. It can also be acted upon by other people or objects. *Thymos* may also be the recipient of direct speech.
>
> **5B.** Interiority: *Thymos* is observed as a container space which may be filled with emotions or other things (Sullivan, 1999, p. 122). Thinking goes on in the *thymos*, and it may be divided in parts before a decision is made.

6. Function: *Thymos* has diverse functions.

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[14] See Harris (2001, pp. 50-70) for a loose but credible discussion of rage and anger in early Greek culture.

[15] E.g., *Il.* 17.720: whilst fighting, two parties may have “an equal *thymos*.”

6A. *Thymos*, loss of: Losing one’s *thymos* generally means death or fainting (Sullivan, 1999, p. 123). Upon death, it may escape from the mouth or limbs and travel to Hades, like *psykhe* (Lynch & Miles, 1980, p. 5; Clarke, 1999, p. 134; Morrison, 1999, p. 136).[16]

6B. *Thymos*, invigoration of: Invigoration of *thymos* is often preceded by stressful decision-making whereby life or death is at stake. For this reason, it has been compared with the fight-flight-or-freeze response of the sympathetic nervous system (Jaynes, 1976, p. 262; Privitera, 2015, p. 71).

6C. *Thymos*, speech capability: A man may speak to his *thymos* (Pelliccia, 1995, p. 116; Sullivan, 1999, p. 122). Pelliccia (1995) calls these monologues *thymos*-speeches, but indicates that the *thymos* itself does not speak back.[17] Both mortals and deities speak to their *thymos*. Among mortals, these instances are related to and preceded by decision making, grief, and confusion (Pelliccia, 1995, p. 213). The nature and frequency of these occurrences in the *Il.* and *Od.* may be observed in Table 1.

Table 1

Direct Speeches to “Thymos,” “Kradie,” and “No One” in the “Iliad” and “Odyssey”

Recipient, speech type, and nature	Mortals		Deities	
	Il.	*Od.*	*Il.*	*Od.*
Direct speech to *thymos*				
Concerning choice	4	3		
Concerning confusion	3	1		
Absent addressee			2	2
Total	7	4	2	2
Direct speech to *kradie* (κραδίη)	-	1[a]	-	-
Indirect speech to no one				
Concerning “how-to (do something)”	2	7	3	
Concerning whether to make an “X or Y” decision	9	16		
Total	11	23	3	-

Note. Data organized by Boban Dedović and derived from Pelliccia (1995, pp. 121-122, 125, 126f.). [a] *Od.* 20.18-21.

[16] E.g., *Il.* 7.131: “his *thymos* escaped from his limbs down to Hades.”

[17] Some scholars disagree. For a robust opposing viewpoint, cf. R. W. Sharples (1983), 'But Why Has My Spirit Spoken with Me Thus?': Homeric Decision-Making, *Greece & Rome*, *30*(1), 1-7.

1.4.2.2. *Phrenes* (φρένες). *Phrenes* is the second most common hypostatic term in Homer and its simple definition may be *midriff*, *heart*, and *mind*.[18] It appears over 343 times in the Homeric epics, 179 times in the *Il.*, and 164 times in the *Od.* (Sullivan, 1988, pp. 190, 207, 209-272). A composite of all the instances of *phren* and *phrenes* may be observed in Table 2.

1. Definition: This untranslatable word is generally defined as meaning *midriff*, *diaphragm*, *mind*, and *thoughts* (Autenrieth, 1895, p. 287), or *midriff*, *heart*, *mind*, and *will* (LSJ, 1940, p. 1954).

2. Attribution: Humans, deities, some animals, and at least one inanimate object have *phren* or *phrenes*.[19]

3. Anatomy: *Phrenes* is anatomically located in the chest and torso, but scholars disagree thereafter. The traditional interpretation is that *phrenes* means midriff (Sullivan, 1988, p. 28). Onians (1951) has strongly argued that it means lungs, while others have insisted it means the diaphragm, or more general processes related to breathing (Clarke, 1999, pp. 83-84). There is ample textual evidence for all these interpretations.[20]

4. Etymology: Scholars do not agree on the etymology of *phren* or *phrenes*. Sullivan (1988) suggests that *phren* may be derived from the Proto-Indo-European constructed root word ***bhren*, meaning *to surround*, or Sanskrit *bhur-*, meaning *to quiver* (p. 21).

> **4A.** Greek: Sullivan (1988) noted that while *phrenes* and *prapides* are similar, relevant distinctions exist (p. 179). The word stem for *phren* relates to many verbs, adjectives, and nouns of similar wide-ranging meaning (Sullivan, 1988, pp. 276-282).

5. Grammatical features: Grammatically, *phrenes* occurs in both the singular (*phren*) and plural. Sullivan (1988, p. 190) reported that it is usually in the plural. Jones (1909, p. 26) counted *phrenes* as occurring 51 times in the singular and 290 times in the plural. Its cases include the nominative, dative, and accusative, but not the genitive (Sullivan, 1988, p. 177).

> **5A.** Function: The grammatical functions of *phrenes* are legion: active agent within person, instrument, in accompaniment with person, acted upon by outside people and

[18] *Phren* is the singular form and *phrenes* is the plural. For convenience, both are treated in this study using the English singular because *phrenes* as an entity is a single hypostasis.

[19] See Sullivan (1988, p. 100f.) for a discussion on this topic.

[20] E.g., in *Il.* 4.245, running fawns have no strength in their *phrenes*—they are out of breath.

forces, as direct object, indirect object, as location wherein other hypostases may be, etc. (see Table 2 for a detailed breakdown).

5B. Interiority: *Phrenes* is observed as a container space which may be filled with emotions, thoughts, grief, or other hypostases (Darcus, 1977, p. 50). For example, the *ker*, *thymos*, and *noos* may be enclosed within the *phrenes*, shown thus (Sullivan, 1988, p. 23):

> ***ker* in *phrenes***
> . . . ἀλλ’ ἔβαλ’ ἔνθ’ ἄρα τε φρένες ἔρχαται ἀμφ’ ἀδινὸν κῆρ.
> . . . but struck where the *phrenes* enclose the solid *ker*. (*Il.*16.481)
>
> ***noos* in *phrenes***
> τῇς ἐν μὲν νόος ἐστὶ μετὰ φρεσίν, ἐν δὲ καὶ αὐδὴ
> There was mind and intelligence in them, they could speak (*Il.*18.419)

Thinking is said to go on in the *phrenes*, as well as verbial activity of indecision.

6. Function: *Phrenes* has many diverse functions.

6A. *Phrenes*, loss of: *Phrenes* can be damaged, destroyed, or temporarily lost. A missing *phrenes* oftentimes means that the person is behaving poorly (Sullivan, 1999, p. 12f.).

6B. *Phrenes*, morality and emotions: *Phrenes* has strong associations with emotions and morality. For example, an angry person may have a *black phrenes* or an upright person may have a *good phrenes*.

6C. *Phrenes*, intellect: The mental activity instances of *phrenes* are counted 48 times in the *Il.* and 57 times in the *Od.* (see Table 2, row 2). *Phrenes* can also allegedly speak, or may be the source of speech (Darcus, 1977, p. 44f.). Russo (2012) has also conducted empirical analyses with respect to some verbial and locative instances of *phrenes* in the *Il.* and *Od.* Notably, his method utilized differentiation vis-à-vis specific constructions related to the verb meaning *to ponder* (see Table 3; derived from Russo, 2012, pp. 17-21). Russo’s data suggest that decision making in the *Il.* is heavily driven by divine intervention, whereas decision making is almost entirely autonomous in the *Od.* (p. 20f.).

Table 2

All Instances, Uses, and Frequencies of “Phren” and “Phrenes” in the “Iliad” and “Odyssey”

Activity types	Homeric Works		
	Il.	*Od.*	*HH.*[a]
1. *Phrenes* as present in a person			
Nom. case with verbs (non-copulative)	8	3	
Nom. case with adjectives and copulative verbs	6	7	
Total	14	10	-
2. A person acts in, by, or in company with *phrenes*			
(Primarily emotional)			
Joy	10	7	4
Pain or sorrow	3	5	
Anger	2	1	
Rage	4		
Fear	4	2	2
(Primarily intellectual)	48	57	9
(Misc. activities)	10	10	1
Total	81	82	16
3. Person has direct relationship with *phrenes*	3	6	2
4. Person described in respect to *phrenes*	10	9	
5. Impersonal expressions with *phrenes*	4	3	
(Other emotions)	5	5	1
Total	22	22	3
6. Outside objects act on or in *phrenes*			
Phrenes as direct object	1	2	
Phrenes as part or location affected			
Joy, pain, and sorrow	8	6	2
Other emotions	4	2	2
Wine		3	
Negative influences	2	1	
Misc. influences	4	5	1
Total	19	19	5
7. Outside agents acting on or in *phrenes*			

Phrenes as direct object	17	4	6
Phrenes indirectly affected	10	17	3
Total	27	21	9
8. *Phrenes* act as the location of other psychic entities			
Thymos	11	6	1
Others	5	3	1[21]
Total	16	9	2
Total (cumulative)	179	164	35

Note. Data organized by Boban Dedović and derived from Sullivan (1988, pp. 207, 209-272).

[a] The *Homeric Hymns* are not part of this survey’s scope. They are included for thoroughness.

[21] Sullivan notes that “the reference to *phrenes* in *H.* XXIX 9 has not been included because the context is unclear” (p. 272). This accounts for the total count being short by one instance.

Table 3

Divine Intervention Versus Autonomy via “Pondering” in the “Iliad” and “Odyssey

Instances of *pondering*	Works	
	Il.	*Od.*
Autonomy (with respect to decision making)		
Monologue with ώ μοι εγώ or pondering via μερμηρίζω[a]	3[b]	“many”
Divine intervention or autonomy in decision making		
μαίνω + ώς monologues started by ώ μοι έγώ[c]	Divine[d]	Autonomous[e]
Resolution of ‘pondering’ via μερμηρίζειν ή ... ή ar[f]		
Divine intervention	5	1
Autonomous	2	7
Total[g]	**7**	**8**
Divine intervention in “how-to” pondering		
μερμηρίζειν... ώς / δπως[h]	Divine[i]	Autonomous[j]
Monologue ending with a decision via ώ μοι έγώ”	4	5
Frequency of *pondering* verb μερμηρίζω	11	27

Note. Data organized by Boban Dedović and derived from Russo (2012, pp. 17-21; see esp. the footnotes). Several hypostases are invoked in the examples provided. Many thanks to Dr. Russo for personally speaking with me on the phone concerning these data.

[a] “μερμηρίζω or a close equivalent” (p. 18). [b] *Il.*11.404, 13.455, and 14.20. [c] See p. 19. [d] “far more” divine instances (p. 19). [e] “Almost always autonomous” (p. 19). [f] “formal scenes of pondering two alternatives with μερμηρίζειν ή ... ή ar” (p. 20). [g] See p. 19, n. 3, 4, for the referenced scenes. [h] See p. 20. [i] “Always divine.” [j] “Always autonomous, but one.”

1.4.2.3. *Prapides* (πρᾰπίδες). *Prapides* is the least common hypostatic term in the Homeric epics and its simple definition may be the same as *phrenes*. This term appears only 11 times in the Homeric epics, nine times in the *Il.* and two times in the *Od.* (Jones, 1909, p. 30; Sullivan, 1987, p. 182; Sullivan, 1988, pp. 283-284). It is always pluralized and only appears in the genitive or dative case (Sullivan, 1987, p. 185).

1. Definition: Both Autenrieth (1895, p. 240) and LSJ (1940, p. 1459) assign *prapides* as being equivalent to *phrenes*. Notable technical objections have been raised (see esp. Sullivan, 1987; Sullivan 1988, p. 179f.).

2. Function: *Prapides* has few functions (see Table 4). Notably, grief or pain can come from the *prapides* (Sullivan, 1987, p. 190).

Table 4

Uses and Frequencies of “Prapides” in the “Iliad” and “Odyssey”

Function of *prapides*		
	Il.	*Od.*
Person acts with *prapides*	4	2
Source of emotion	2	0
Location of liver	3	0
Portion of lyre	0	0
Total	9	2

Note. Data organized by Boban Dedović and derived from Sullivan, 1988, pp. 283-284).

1.4.2.4. *Kardia* (καρδία) / *kradie* (κραδίη), *ker* κῆρ, and *etor* (ἦτορ). *Kardia* / *kradie*, *ker*, and *etor* are similarly defined as *heart*.[22] In Homer, *etor* is more common than the others. The word frequencies are thus: *etor* (101 instances), *kradie* (62 instances), and *ker* (81 instances) (Sullivan, 1999, p. 158).

1. Definition: These untranslatable words are generally defined as meaning the *heart* organ, the *seat of courage*, *emotion*, and *reason* (Autenrieth, 1895, pp. 135, 153f., 161f.), or *heart*, *desire*, and *mind* (LSJ, 1940, pp. 780, 877, 948).

2. Attribution: Humans, deities, and animals have *kardia / kradie*, *ker*, and *etor* (Sullivan, 1999, p. 144).

3. Anatomy: These terms are usually located anatomically in the chest area (Furley, 1959, p. 2; Sullivan, 1999, p. 144). Jaynes (1976, p. 267) disagrees with respect to *etor*; instead, it seems to him that *etor* refers to *belly* or *stomach*.[23]

[22] The κραδίη hypostasis is the Homeric form, καρδία is the Ionic form, and κῆρ is related, but distinct.

[23] Jaynes (1976) associates this hypostasis with the gastro-intestinal tract. “I have thus the temerity to suggest that *etor* in Phase I came from the noun *etron* — belly, and that in Phase II, it becomes internalized into sensations of the gastro-intestinal tract, particularly the stomach. Indeed, there is even evidence for this in the *Iliad*, where it is

4. Etymology: Scholars generally agree on the etymology of *kardia / kradie* and *ker*. They likely originate from the Proto-Indo-European root **ḱḗrd*, meaning *heart* (Mallory & Adam, 1997, p. 262f.). There are many relevant cognates related to centrality and the body: English *core* and *cardiac*, Latin *cordis* (Eng.: *heart*), including the ancient Hittite word for *heart*, *ker* (cuneiform: 𒄷𒀀𒊏). The etymology of *etor* is uncertain.[24]

5. Grammatical features: Grammatically, they only appear in the singular and function as active agents within a person, an instrument, or location (Sullivan, 1999, p. 144f.). Notably, *ker* takes on adjectives like *shaggy*, *noble*, and *iron*.[25]

6. Function: *Kardia / kradie*, and *ker* have somewhat limited mental function. They are oftentimes used to describe physical sensations and emotions. For example, the *kardia* can throb (*Il.*13.442) and the *ker* can allegedly refuse to eat (*Il.* 19.319). There is one instance in *Od.* 20.18-21 where Odysseus speaks to his *kradie* (see Pelliccia, 1995, p. 125f.). However, these terms have fewer applications to thinking and decision-making (Sullivan, 1999, p. 145).

1.4.2.5. *Psykhe* (ψυχή). *Psykhe* is a less common Homeric hypostasis whose simple definition is *soul*. It appears 85 times in Homer in both singular and plural, although *Il.* 21.569 indicates that each person has just one *psykhe* (Sullivan, 1999, p. 161f.). To be sure, *psykhe* has no active role in mental action or decision making (Furley, 1959; Sullivan, 1999, p. 161f.; Jeremiah, 2010, p. 232); nevertheless, it plays an important role concerning the grammatical nature of reflexive personal pronouns.

1. Definition: This untranslatable word is generally defined as meaning *breath of life*, *life*, *soul*, and *spirit* (Autenrieth, 1895, p. 294f.), or *life*, *ghost*, *soul*, and *spirit*. (LSJ, 1940, p. 2026f.). However, some scholars have been resolved in asserting that *psykhe* does not mean breath (Furley, 1959, p. 2f.; Clarke, 1999). Jaynes (1976, p. 271) asserted that it means life substances like blood.

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precisely stated that food and drink are taken to satisfy the *etor* (19:307)” (p. 267). Moreover, he cites the physiological reactions akin to ‘sinking feelings’ and ‘guts’ being akin to bravery, in addition to joy: “it is the *etor* of Zeus that laughs with joy, or what we would call a belly-laugh (21:389)” (p. 268).

[24] Cf. n. above.

[25] Recall section 1.3 for the discussion on metallurgical references in the *Il.* and *Od.*

2. Attribution: Humans have a *psykhe*, while animals generally do not (Warden, 1971b, p. 101; Garland, 1981, p. 49).[26] Deities do not appear to have a *psykhe* (Almqvist, 2017, p. 23, n. 110).[27]

3. Anatomy: *Psykhe* does not have a clear and certain anatomical concomitant, nor is it explicitly a material object.

4. Etymology: The etymology of *psykhe* is uncertain. It may be derived from the Greek stem ψυχ-, which is related to *breath*, *cold*, and *wind* (Clarke, 1999, p. 144).

5. Grammatical features: Locative activity does not take place in the *psykhe*. It occurs commonly in the nominative and accusative cases, and less so in the genitive and dative cases (Darcus, 1979, pp. 30-33). That is, it appears as the subject or object of a verb most frequently. Its function is also as an active agent within a person.

6. Function: *Psykhe* mainly functions with respect to the property of biological life, physiological separation from the corporal body, and the *post mortem* journey to—and existence in—Hades.

> **6A.** *Psykhe*, in context: *Psykhe* is only mentioned when death or loss of waking reactivity happens or is imminent (Sullivan, 1999, p. 162). This includes fainting. Scholars have noted that in the *Il.*, *psykhe* is referred to as a prize that may be taken from a man by means of a spear in the right place (Furley, 1959, p. 4; Jaynes, 1976, p. 271; Darcus, 1979, p. 31).[28]
>
> **6B.** *Psykhe*, loss of: Losing *psykhe* means death or fainting (cf. context usage; Furley, 1959, p. 4; Clarke, 1999, p. 129f. Sullivan, 1999. p. 162; Cairns, 2014, p. 11). It may dissolve, be destroyed, be bled out, or leave through the mouth or limbs, like *thymos*.[29] It may be described as flying away, not unlike the Egyptian *Ba* that would depart from the shoulder of the deceased in the form of a human-headed bird.

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[26] Both authors indicated that animals do not have them, but LSJ (1940, p. 2026f.) points to *Od.* 14.426, where the *psykhe* leaves a boar once it died; see also Warden (1971b, p. 95f., n. 1).

[27] “It is more difficult to speak of the presence of a ψυχή in the gods. . . and thus even if present in the immortals, it is not something very likely to be described.”

[28] E.g., *Il.* 22.161.

[29] These examples are prominent in the *Il.*: for dissolving, cf. 5.296, for being destroyed, cf. 22.325, for being coughed out, cf. 9.409, and for escaping through a wound, cf. 14.518 and 16.505; see esp. Garland (1981, p. 47) for a table cataloging all these instances.

1.4.2.6. *Noos* (νόος). *Noos* is a relatively common term in the Homeric epics. Its simple definition is *mind*. In the Homeric epics, it appears over 100 times (Sullivan, 1999, p. 61). With respect to intelligence, it is considered the most important hypostasis to have in the *Il.* and *Od.*

1. Definition: This untranslatable word is generally defined as meaning *mind*, *understanding*, or *thought* (Autenrieth, 1895, p. 200; LSJ, 1940, p. 1180f.). There is little disagreement among scholars that *noos* is mainly related to intellectual activity (Clarke, 1999, p. 120).

2. Attribution: Humans, deities, and animals have *noos* (Sullivan, 1999, p. 61).

3. Anatomy: While *noos* is sometimes localized in the chest area,[30] it does not have a defined or material anatomical concomitant (Darcus, 1980; Clarke, 1999, p. 121).

4. Etymology: The etymology of *noos* is uncertain. It may be the noun form of the Greek verb νοεῖν, meaning “to see” or “to think.” Fritz (1943, p. 86), in citing a prior survey, observed that this verb is used 80% of the time with respect to visual recognition and 20% of the time in planning or intentional behavior.[31] *Noos* may also be derived from νεύειν, meaning "to nod," or the root *snu*, meaning "to sniff" (Fritz, 1943, p. 92).[32]

5. Grammatical features: *Noos* only appears in the singular in Homer (Sullivan, 1999, p. 61). Its main cases are nominative and accusative, see Table 5 (Darcus, 1980).

> **5A.** Interiority: *Noos* has peculiar spatial qualities related to metaphoric interiority. To be sure, it is unusual for *noos* to exhibit spatial qualities from a grammatical standpoint; that is, actions of verbs rarely take place “in the *noos*.” Notwithstanding, *noos* can hide things, like a person’s true nature, intention, or attitude towards a situation. It can conceal itself, be hidden from the person themselves, or hidden from others. This feature merits a few rare textual examples.
>
> > ἐξαύδα, μὴ κεῦθε νόῳ, ἵνα εἴδομεν ἄμφω.
> > Speak out, let us both know, don’t hide it away in your *noos*. (*Il.* 1.363; also 16.19)
> >
> > χαῖρέ τε καὶ μή μοί τι κακῷ νόῳ ἀντιβολήσαις
> > Greetings, and may it be with no evil *noos* you meet me (*Od.* 13.229)

[30] *Noos* may be contained within the *thymos* (*Od.* 14.490) or the *phrenes* (*Il.* 18.419), both of which are commonly localized in the chest and midriff area.

[31] Clarke (1999, p. 122) seems to agree that *noos* is derived from the Greek verb meaning “to see.”

[32] Warden (1971, p. 3) agrees that *snu* is the best fit.

5B. Function: The grammatical functions of *noos* are notable: active agent within person, instrument, in accompaniment with person, and acted upon by outside people and forces (Sullivan, 1999).

6. Function: *Noos* is primarily associated with intellectual activity. Within this domain, however, its functions are widespread. *Noos* is also associated with age; e.g., in *Il.* 23.590, the *noos* of a young man is “rather hasty.” (Sullivan, 1999, p. 63).

6A. *Noos*, loss of: When someone loses their *noos*, the result is foolish behavior (Sullivan, 1999, p. 62). *Noos* is also something to be discovered or learned. For example, a man’s *noos* may know something; consequently, the man tries to know his *noos* (Darcus, 1977, p. 50). Upon death, the *noos* does not survive (Fritz, 1943, p. 83), unlike *psykhe*.

6B. *Noos*, relation to vision: Because *noos* deals with knowledge, its hypostatic relationship with visual sense perception has been highlighted by several scholars (Furley, 1959, pp. 9-10; Clarke, 1999, p. 61; Privitera, 2015, p. 66).[33] It has been observed that the metaphors used to describe intelligence are oftentimes associated with luminosity, and darkness for stupidity: e.g., a smart person may be called “bright”; understanding other people may require “seeing things clearly,” and; an unintelligent person may be a “dimwit” (Vermeule, 1979, pp. 25-26).[34] In *Il.* 3.277, Helios “knows” everything because he can “see” everything. Darcus (1980, p. 33) noted that *noos* is “an organ of clear inner vision.” Warden (1971, pp. 9-14) has carefully noted that in the *Il.*, the *noos* deals with simple or concrete recognition, but in the *Od.* it deals with delayed recognition and is more often translated as “knowing.”

6C. *Noos*, as thought or idea: A *noos* may also be referenced as an idea, plan, or thought. Clarke (1999, p. 125) noted that a *noos* is a “thing produced” by a character. Notably, Clarke (1999, p. 121) carefully observed one instance where Paris begins a description by speaking of his *kradie* only to have it turn into a *noos* a few lines later (*Il.* 3.60-63).

[33] Cf. esp. Clarke (1999), as he has surveyed many more works in support of this view.

[34] Cf. *noos* and its relationship with brightness to the death scenes in the *Il.*, whereby loss of life is characterized as “darkness” covering the eyes or the person being enveloped in “black night” (Morrison, 1999, p. 136); see also, Constantinidou (1994) for a helpful discussion concerning eyes and vision in the Homeric tradition.

6D. *Noos*, as measure of someone’s wit: *Noos* can take on adjectives related to physical strength in order to indicate someone’s intellectual prowess. Zeus has a strong *noos* and is known for it (Warden, 1971, p. 7ff.). Notably, the *Od.* shows uses of *noos* that are remarkably contemporary, e.g.:

> εἰσί μοι ὀφθαλμοί τε καὶ οὔατα καὶ πόδες ἄμφω
> καὶ <u>νόος</u> ἐν στήθεσσι τετυγμένος οὐδὲν ἀεικής
>
> I still have my own eyes and ears and both my feet
> and a <u>*noos*</u> in my breast in no way wrongly fashioned (*Od.* 20.365-366)

In general, *noos* is a measure of someone’s intellect.

Table 5

Uses, Cases, and Frequencies of “Noos” in the “Iliad” and “Odyssey”

Grammatical Case	Frequency	
	Il.	*Od.*
Nominative		
With verbs in passive voice	2	3
Subject of verb	5	6
Others	14	12
Genitive	2	5
Dative		
Locative or comitative-instrumental	2	7
(of) Respect	1	1
Accusative[a]	20	21
Total	46	55

Note. Data organized by Boban Dedović and derived from Darcus (1980).

[a] See esp. p. 35, n. 8. for a deeper breakdown; see also p. 38 for a summary.

1.5. Theoretical Approaches, Findings, and Shortcomings

For the past century, countless classical scholars have sought to systemize and explain the strange nature of Homeric hypostases. The view originally posited by Snell (1982) championed the idea that early Greek society did not have a unified concept of the *mind* or self. These views

were furthered by Adkins (1970). Others have retorted that just because there is no mention of a concept does not mean it did not exist (this is known as the argument from silence). Clarke (1999, p. 11) argued that there is no “systematic doctrine” with respect to mental language in the Homeric tradition. Jeremiah (2010) has taken a more moderate approach in positing that the development of mental language resembled the societal need for such language. Russo (2012, p. 21) recently introduced the notion of thinking about the *Il.* and *Od.* as separate poems, in mutually exclusive distinction perhaps. In sum, scholars do not agree on a unified answer as to why there were so many mental language terms in Homer. Moreover, there is even less agreement on the best approach to take for furthering the field of study.

1.5.1. Jaynes’ (1976) Model of Greek Consciousness. Jaynes (1976), in following Snell, posited a model of Greek cognitive development that was represented in four phases.

Table 6

Jaynesian Model of Mental Language Development in Homer

Phase	Name	Nature of Hypostatic Terms
I	Objective	Simple external observations - Externally perceived activity
II	Internal	Internal sensations described as observations - Internal physiological sensations are described by means of verbs and activities normally seen outside of the body - Build up of stress before decisions need to be made - Hypostases take form of internal organs perceived as internal (albeit distinct) agents
III	Subjective	Internal actions where metaphoric actions *may* occur - Consolidation of terms begins - Terms begin overlapping each other anatomically and functionally
IV	Synthetic	Unison of hypostases into a conscious-self[a] capable of introspection - Full-fledged internal container metaphors - Fewer hypostases - Very few references to internal sensations from Phase II

Note. Paraphrased from Jaynes (1976, p. 260). [a] Jaynes’ operational definition of consciousness is technical, precise, and worthy of careful review, see pp. 48-66.

In general, he argued that when the *Il.* was written, the hypostatic words indicative of mental action had very different meanings; and, these meanings changed drastically between 850-600 B.C.E, as evidenced by the *Od.* The hypostatic terms, it seems to Jaynes, transitioned from referring to objective concrete objects in earlier phases and abstract meanings in latter phases (Jaynes, 1976, p. 260ff.). This process of unification resulted in a generally unified concept of *mind* as a metaphoric container space capable of introspection.

1.5.2. Computational-Linguistic Findings by Raskovsky et al. (2010). In 2010, Raskovsky and colleagues presented findings related to their computational study on introspection in the *Il.* and *Od.* Their study compared the lexical frequency of words related to introspection between the two Homeric epics. Raskovsky’s team used a topic cluster (and a software application called *Mallet*) to compile word frequency for “mind,” “think,” and “feel,” and “felt.” “Mind” was the primary indicator of introspection during the compilation of their topic cluster. They found that there was a significant difference in word density (frequency) related to introspection. The shortcomings of their study were few but considerable: (i) limited glossary of terms; (ii) utilization of only one translator, Samuel Butler, and; (iii) false-positive results related to words like “feel.”[35]

1.6. Present Studies

The present investigation sought to compare the frequency of mental language in the *Il.* and *Od.* in both English translations and the original Greek. Two computational linguistic studies were conducted. Each is taken up in turn.

1.6.1. Study 1. Study 1 tests to see if the frequency of Homeric hypostases increased from the *Il.* to the *Od.* The selected terms are: *thymos* (θυμός), *phrenes* (φρένες), *kardia* (καρδία), *kradie* (κραδίη), *etor* (ἦτορ), *psykhe* (ψυχή), *prapides* (πρᾰπῐ́δες), and *noos / nous* (νόος). These hypostases were chosen to represent the construct of mental organs within Greek versions of the Homeric epics. This was operationalized by counting the frequency of the hypostatic terms in both works and computing their Total Word Densities (TWD). The word frequencies of the hypostases’ potential English-equivalents were also computed in order to observe how the English translators differed in their interpretations. To be sure, these

[35] E.g., without robust filtering methods, there is no means of distinguishing between mental language and non-mental language for some terms: “I felt good” versus “I felt the material,” as was the case in their study.

observational statistics are not and cannot be indicative of mental language *proper*. Nevertheless, comparing these word frequencies yields several methodological advantages—particularly with respect to how the findings from study 2 are to be interpreted.

In general, the results from study 1 are a litmus test for evaluating (1) whether prior scholarship concerning the Homeric hypostases aligns with empirical data, and (2) the extent to which English translations are useful in understanding the meanings of words that originated from Homeric Greek. For example, Jaynes (1976) noted that other than *thymos*, the other hypostases were rare occurrences throughout the epics. Others, too, have associated the hypostases with anatomical sensations in or around the midriff. Russo and Simon (1968) have firmly remarked that vocabulary is an integral means of assessing the works’ creators’ intentions.[36]

Applying empirical methods unto these claims may suggest whether prior scholarship is even progressing in a direction that can be measured objectively. Second, this study provides a basis for using English translations of Homer for the purpose of concerned psychological inquiry. This is most apparent with respect to the frequency of *noos* in comparison to *mind* in English, owing to prior scholars’ consistent agreement that *noos* is confidently related to mental activity. In sum, empirical evidence in favor of the considerations stated above are useful in determining whether there is tangible utility in using word frequency data for making more complex inferences.

1.6.2. Study 2. Study 2 builds upon the work done in study 1 by further evaluating differences in mental language among English translations of the *Il.* and *Od.* The construct of interest—mental language—was operationalized by compiling a glossary of terms and then determining how often those terms appeared in the works. The method conceptually followed prior work done by Raskovsky et al. (2010). However, the construct of interest was mental action itself, not introspection. Given the problems associated with how Homeric hypostases like *thymos* are translated, a different approach seemed necessary.

Study 2’s design differentiates itself from all prior work done for reasons threefold: (1) a within-subjects design; (2) an almost twentyfold increase in sample size, and; (3) a mix of both

[36] “The first is that we cannot be sure of the *exact* [italics via authors] relationship between the vocabulary of mental life in Homer and all that Homer thought or believed about mental life. We do assume, however, that the vocabulary is an important index to the poet's thinking” (p. 486). *Creators* is used in the plural by the present author—and purposefully so—in order to call attention to ‘Homer’ as a cultural tradition, not a single person (cf. section 1.2.3).

manual and algorithmic processes for development of the mental language glossary. First, translators were chosen if, and only if, they translated both the *Il.* and *Od.* This allowed for a within-subjects design that increased statistical power. Second, while the Raskovsky et al. (2010) study only utilized one translator, study 2’s sample had 17. Third, the glossary of terms designated as mental language underwent three layers of review—two manual and one algorithmic. This process was also executed after the word frequencies were calculated in order that false-positives could be reduced.

2. Study 1

2.1. Predictions

Study 1 counted the frequencies of Homeric hypostases in the original Greek texts. These words were *phrenes*, *thymos*, *kardia* / *kradie*, *ker*, *etor*, *psykhe*, *prapides*, and *noos*. For the English translations, mean word frequencies of potential English-equivalents were computed. Some of these words were *heart*, *mind*, *soul*, and *ghost*. The compiled frequencies of both Greek and English versions were then compared. This study was observational in nature. The predictions were thus:

H_1 = Total word densities of all Homeric hypostases (Greek only) will be higher in the *Od.* than the *Il.*

H_2 = Total word densities of *psykhe* and *noos* (Greek only) will be higher in the *Od.* than the *Il.*

2.2. Methods

2.2.1. Textual Materials. The textual materials were paired versions of the *Il.* and *Od.* in both Homeric Greek ($N = 1$) and English translation formats ($N = 17$). The Greek version of the *Il.* was D. B. Monro’s and T. W. Allen’s (1920) copy, in addition to A. T. Murray’s (1919) *Od.* Both versions are time-honored and were obtained from Tuft University’s *Perseus Scaife Viewer* (*Scaife*) tool.[37] 17 pairs of English translations of the *Il.* and *Od.* by the same translator were utilized (34 total texts, see Table 7).

[37] *Scaife* is a free, open-source, web-based library of ancient texts in Greek, English, Latin, and other languages. This tool was used for compiling word use counts in the Greek versions of the *Il.* and *Od.* (https://perseus.scaife.org).

Table 7

Utilized English Translations of Homer’s “Iliad” and “Odyssey”

Translator	Form[a]	Publish date		*Iliad* word counts			*Odyssey* word counts		
		Il.	*Od.*	Total	Unique	VD[b]	Total	Unique	VD[b]
Thomas Hobbes	V	1675	1675	116578	7364	0.063	91018	6250	0.069
Alexander Pope	V	1715*	1725	139673	8674	0.062	109011	8851	0.081
William Cowper	V	1791	1791	141289	10026	0.071	109936	9001	0.082
Andrew Lang et al.	P	1882	1879*	138295	7159	0.052	136151	6333	0.047
Samuel Butler	P	1898*	1900	153246	7516	0.049	117643	6456	0.055
Augustus T. Murray	P	1924	1919*	179438	7815	0.044	134769	6302	0.047
Emile V. Rieu	P	1950	1946*	161872	8649	0.053	126676	7990	0.063
Richard Lattimore	V	1951*	1965	178630	7473	0.042	137593	6538	0.048
Robert Fitzgerald	V	1963	1961*	142904	9893	0.069	107242	8748	0.082
Robert Fagles	V	1990*	1996	165684	8767	0.053	122775	8162	0.066
Stanley Lombardo	V	1997*	2000	130701	8877	0.068	106880	6959	0.065
Ian C. Johnston	V	2002	2006	148258	8143	0.055	126904	6962	0.055
A.S. (Tony) Kline	P	2009	2004*	132782	8481	0.064	108149	7138	0.066
Stephen Mitchell	V	2011*	2013	147836	7705	0.052	112202	6496	0.058
Edward McCrorie	V	2012	2004*	142606	8391	0.059	122510	6804	0.056
Barry B. Powell	V	2013*	2014	165872	7715	0.047	128267	6370	0.050
Peter Green	V	2015*	2018	160279	9315	0.058	124486	7954	0.064

Note. $N = 17$.

[*] Indicates that it was the first work translated of the two.

[a] V = Verse; P = Prose. [b] VD = Vocabulary Density: ([unique words] / [total words]).

2.2.2. Procedure

2.2.2.1. ***Selection of Translators.*** A master list of all potential translations was initially created. The most fruitful sources were four books (Foster, 1918, pp. 63-76; Bush, 1926; Young, 2003; Steiner, 1996). Thereafter, the translations list was filtered via the following limiting

conditions: (1) the translator translated both works into the English language; (2) the works were complete (i.e., all 24 books from each work); (3) the translations were readable (i.e., not archaic in language), and; (4) digital full-texts were available. Many viable works were excluded by necessity due to the lack of availability in text-only digital form. In sum, 17 translators were selected on an availability basis because they had translated both the *Il.* and *Od.*

2.2.2.2. *Sanitation of Texts.* The 34 publications were obtained from publicly available sources (like *Scaife*), library loan, or independent purchase. Next, the works were prepared into standalone text files (.txt) such that front matter, back matter, title pages, footnotes, art, and other non-translation contents were removed. In some cases, optical character recognition (OCR) software was used in order to transform images of book pages into text. This process—collectively referred to as sanitation—was done in order that each text file contained only the translated text of the 24 books within each work.

2.2.2.3. *Data Compilation.* The 17 pairs of English translations and single pair of the Greek version were imported into a linguistic analysis tool named *Voyant*.[38] Thereafter, *Voyant* computed the number of times these hypostases occurred within each Greek work. The same process was followed for the English translations; albeit the English-equivalents were used instead of the Greek terms.

2.3. Measures

2.3.1. Raw Instances. The construct of mental language was represented by the word frequencies of Homeric hypostases. For the Greek texts, this included *thymos* (θυμός) *ker* (κῆρ), *kardia* (καρδίη), *kradie* (κραδίη), *noos* (νόος), *phrenes* (φρένες), *prapides* (πρᾰπῐ́δες), *psykhe* (ψυχή), and *etor* (ἦτορ). For the English-equivalents, words like *mind*, *heart*, and *soul* were chosen. This was operationalized by counting the number of times those words appeared in each text. For the English-equivalents, mean counts across all 17 versions of each work were utilized.

2.3.2. Total Word Density (TWD). The construct of comparative frequency from the *Il.* to the *Od.* was operationalized by computing the relative density of each term in each work. That is, how often the term appeared per 10,000 words. This standardization was necessary because the works had significant word count differences. The Greek versions differed by almost 20,000

[38] *Voyant* is a free, open-source, web-based linguistic analysis tool used to compute word frequencies of textual records (https://voyant-tools.org).

words: *Il.* = 112,030; *Od.* = 87,234. The means of the English translations differed by almost 30,000 words, *Il.* = 149,761; *Od.* = 118,954.

2.4. Results and Discussion

2.4.1. Greek Results. Word frequencies of Homeric hypostases in Greek versions of the *Il.* and *Od.* were compiled (see Table 8). Cumulatively, TWD increased from 74.71 in the *Il.* to 80.36 in the *Od.* This calculation provides support for hypothesis 1, which predicted that the *Od.* would contain a higher relative frequency of Homeric hypostases in comparison to the *Il.* Thereafter, a granular word-by-word count indicated that while *thymos*, *ker,* and *prapides* decreased in TWD from the *Il.* to the *Od.*, *kardia*, *kradie*, *noos*, *phrenes*, *etor*, and *psykhe* increased. Notably, *noos* increased in TWD from 4.28 to 6.19 while *psykhe* almost doubled in frequency (2.95 to 5.5; see Table 8). These data provide support for hypothesis 2, which predicted that *noos* and *psykhe* would increase in TWD from the *Il.* to the *Od.*

2.4.2. English Results. Word frequencies of English-equivalents for Homeric hypostases were compiled among 17 paired translations (see Table 9). Cumulatively, TWD increased from 53.17 in the *Il.* to 56.48 in the *Od.* Notably, TWDs increased for *heart*+, *mind*+, and *soul* (see Table 9).

2.4.3. Discussion. Results from a word frequency analysis of Homeric hypostases in both Greek and English translations support the assertion that the *Od.* contains more mental language than the *Il.* More importantly, the consistent patterns of frequency in the English-equivalent and Greek versions suggests that word frequency analyses may be methodologically meaningful. For example, in the Greek texts, *thymos*, *ker*, and *kardia / kradie* were all related to the heart. The TWDs made up almost half of the total sum (44.36 out of 80.36 for the *Od.*). This pattern was also true with the English-equivalents for similar associations, mainly *heart* and *breast* | *breasts* (28.51 out of 56.48 for the *Od.*). While imperfect, these results suggest statistical agreement among translators with respect to anatomical association and function of the Homeric hypostases in the *Il.* and *Od.* That is, word frequency means resemble the Greek and English-equivalents enough so, such that the patterns are consistent from one work to the next. In turn, this provides support for the word frequency method utilized herein, thereby warranting further investigation, which is taken up in study 2. (The weaknesses are discussed collectively among both studies 1 and 2 at the end of the paper.)

Table 8

Lexical Frequency of Greek Terms Denoting Mental Language in Homeric Epics

phrenes			***psykhe***			***noos***			***thymos***		
Term	*Il.*	*Od.*	Term	*Il.*	*Od.*	Term	*Il.*	*Od.*	Term	*Il.*	*Od.*
φρήν	1	0	ψυχὰς	3	8	νόος	22	18	θυμὸς	97	71
φρενός	0	0	ψυχή	6	2	νόον	20	21	θυμός	25	30
φρεσὶ	62	68	ψυχὴν	8	4	νόῳ	4	7	θυμῷ	117	113
φρεσὶν	21	35	ψυχαὶ	2	3	νόοιο	1	3	θυμὸν	148	70
φρεσί	4	0	ψυχῆς	5	4	νόου	1	2	θυμόν	41	31
φρεσίν	11	6	ψυχὴ	8	21	νοός	0	1	θυμοῦ	8	7
φρένες	12	10	ψυχήν	1	0	νόω	0	1			
φρένα	28	18	ψυχαί	0	1	νοῦς	0	1			
φρένας	38	23	ψυχῇ	0	4						
φρέν	1	2	ψυχέων	0	1						
φρενὶ	0	1									
Sum	178	163		33	48		48	54		436	322
TWD[a]	15.89	18.69		2.95	5.50		4.28	6.19		38.92	36.91
kradie / kardia			***prapides***			***ker***			***etor***		
Term	*Il.*	*Od.*	Term	*Il.*	*Od.*	Term	*Il.*	*Od.*	Term	*Il.*	*Od.*
κραδίη	14	20	πραπίδων	5	0	κῆρ	43	32	ἦτορ	48	47
κραδίην	11	4	πραπίδεσσι	2	2	κηρός	0	1			
κραδίῃ	4	2	πραπίδεσσιν	2	0	κῆρι	9	6			
καρδίῃ	3	0									
κραδίης	1	0									
Sum	33	26		9	2		52	39		48	47
TWD[a]	2.95	2.98		.80	.23		4.64	4.47		4.28	5.39

Note. Based on Greek versions of the *Il.* (Monro & Allen, 1920) and *Od.* (Murray, 1919).

[a] TWD = Total Word Density: occurrences per 10,000 words. Total word counts: *Il.* = 112,030; *Od.* = 87,234.

Table 9

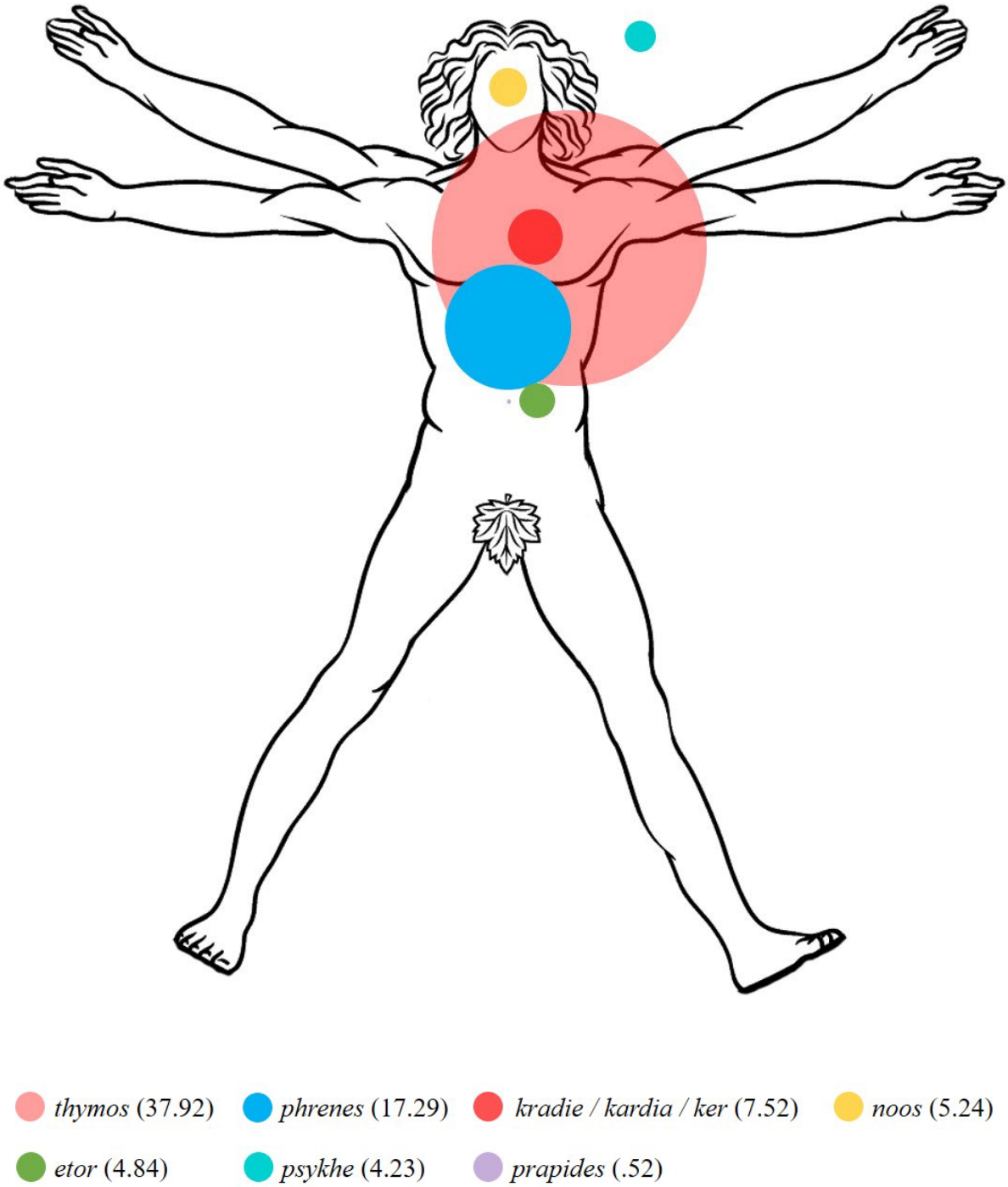
Frequency of Hypostatic Terms in Homeric Epics - Greek and English Versions

Hypostasis	Instances		Total Word Density (TWD)[a]	
	Il.	*Od.*	*Il.*	*Od.*
		Greek		
thymos (θυμός)	436	322	38.92	36.91
ker (κῆρ)	52	39	4.64	4.47
kardia (καρδίη) / kradie (κραδίη)	33	26	2.95	2.98
	521	**387**	**46.51**	**44.36**
noos (νόος)	48	54	4.28	6.19
phrenes (φρένες)	178	163	15.89	18.69
prapides (πρᾰπί́δες)	9	2	0.8	0.23
	235	**219**	**20.97**	**25.11**
psykhe (ψυχή)	**33**	**48**	**2.95**	**5.5**
etor (ἦτορ)	**48**	**47**	**4.28**	**5.39**
Total	837	701	74.71	80.36
		English[b]		
heart+	367.53	313.06	24.54	26.32
breast | breasts	63.88	24.94	4.27	2.1
midriff	2.76	0.71	0.18	0.06
lung | lungs	2.71	0.35	0.18	0.03
	436.88	**339.06**	**29.17**	**28.51**
mind+	107.59	112.88	7.18	9.49
brain+	9	7.53	0.6	0.63
	116.59	**120.41**	**7.78**	**10.12**
soul+	36.65	31.88	2.45	2.68
life | lives	96.59	76.41	6.45	6.42
spirit+	88.35	63.82	5.9	5.37
ghost+	1.18	19.71	0.08	1.66
phantom | phantoms	1.88	5.88	0.13	0.49
	224.65	**197.7**	**15.01**	**16.62**
stomach+	1.59	2.76	0.11	0.23
belly | bellies	16.41	11.94	1.1	1
	18	**14.7**	**1.21**	**1.23**
Total	796.12	671.87	53.17	56.48

[a] TWD: occurrences per 10,000 words. Total word counts: *Il.* = 112,030; *Od.* = 87,234. [b] Mean instances. *N* = 17.

Figure 2

Homeric Hypostatic Man – Mean Word Densities and Anatomical Locations of Mental Language Terms in Homer’s “Iliad” and “Odyssey”



Note: Illustration by Boban Dedović. The numeric values in the key represent mean Total World Density (TWD) between both the *Il.* and *Od.* (occurrences per 10,000 words).

3. Study 2

3.1. Predictions

Study 2—which only utilized English translations of the *Il.* and *Od.*—analyzed the extent to which the *Il.* and *Od.* differed with respect to mental language frequency. Mental language frequency was measured for each work. 17 translators who translated both the *Il.* and *Od.* were selected in order to increase statistical power via a within-subjects design. Their 34 translations were imported into a single digital corpus after being sanitized to only include the translation portion. The list of all words contained therein and their frequencies was used to compile a glossary of mental language terms. The linguistic analysis tool *Voyant* computed how many times the words in the glossary appeared in each work. Results were organized into a spreadsheet for statistical analyses. A paired samples *t*-test was conducted to determine whether the works differed in their use of mental language. Additional correlational analyses were also done for available factors: translation order, translation style, and vocabulary density. Finally, two ANCOVA analyses were conducted in order to assess whether any observed differences in the use of mental language could be explained by translators’ artistic choices. That is, mean mental language densities were compared with respect to grouping factors (1) translation style (verse or prose) and (2) translation order, whilst controlling for vocabulary density. The predictions were thus:

> **H_3** = Mean mental language density scores will be significantly higher in English translations of the *Od.* in comparison to mean mental language density scores of the *Il.*
>
> **H_4** = Mean mental language density scores of the *Il.* and *Od.* groups will have an effect size such that the group means will be at least 2 standard deviations apart (Cohen’s $d > 2$).

3.2. Methods

3.2.1. Procedure. Study 2 utilized the same textual materials and tools already detailed in study 1’s method.

3.2.1.1. *Compilation of the Mental Language Glossary (MLG).* The MLG was compiled by algorithmic methods in addition to manual filtering. The 34 works previously imported into *Voyant* generated a master list of the most frequently used words in the entire corpus. The initial list included 40,225 unique words and 4,568,155 total words. Thereafter, the 40,225 unique

words were reduced to 7,500, owing to the fact that the first 7,500 comprised of 94.5% of the total word count.

Words included in the MLG were first selected via manual review of the entire list of 7,500 unique words. Many words that ended up in the final MLG were identified in this step: e.g., *mind*, *think*, *thought*, etc. The initial selection was liberal with respect to scrutiny. Liberal that is, in terms of including potentially metaphoric words indicative of mental action in Homer, like *divide* and *sway*. Mainly, words were selected if they related to the lifecycle of decision making: perception, speaking, thinking, doubting, choosing, etc. This step reduced the list from 7,500 words to 484 words.

The second round of filtering utilized simple algorithmic methods. The 484 selected words were filtered on the basis of having at least one other MLG word within five words of text, a.k.a. context filtering, e.g.:

> **Kept “divided”**
> . . . in debate when opinions were **divided**. He then with all sincerity . . . (*Il.* 15.284, Butler, 1898)
>
> **Removed “divided”**
> . . . battle alive, and his kinsmen **divided** his wealth among themselves. Then . . . (*Il.* 5.157, Butler, 1898)

This step reduced the list from 484 words to 143 words. Instances of *heart*+, *brain*+, and *mind*+ were marked using this method, but not removed because they required stringent manual review in a subsequent step.

The final round of filtering was a manual review of the terms’ instance contexts. The most common removal reason was due to a false-positive result from the prior step, whereby the proximity of candidate terms did not yield an instance of mental language, e.g.:

> **Kept “brain”**
> . . . the wine had confused his **brain**, I leaned over and said . . . (*Od.* 9.358, Mitchell, 2013)
>
> **Removed “brain”**
> . . . the arrow sank into his **brain**, and he brought confusion on the . . . (*Il.* 8.85, Lang, 1883)

This step reduced the list from 143 to 86, whereafter word stems were consolidated further (e.g., *planned* and *planning* consolidated into *plann*+). The final list of words in the MLG included 70 word stems.

3.2.1.2. *Data Compilation.* Third, the total frequency count of each word in the MLG was computed for each of the 34 total works. Terms that were highly prone to a false-positive result were screened again via context filtering of all instances. The terms *divide* and *sway* were

two examples, in addition to all major hypostatic English-equivalents, like *mind*, *brain*, and *heart*. Words which underwent manual filtering were suffixed with a “(-)” marker. After all instances were manually reviewed, the word frequencies were updated. Finally, the results were combined into a spreadsheet and imported into *JASP* for statistical analyses.[39]

3.3. Measures

3.3.1. Mental Language Density (MLD). The construct of Mental Language Density (MLD) within a text refers to the extent to which a given work uses language indicative of thought, reasoning, decision making, etc. MLD was operationalized by first determining what words constituted mental language, including them into a glossary, then followed by counting their frequencies in the *Il.* and *Od.* on a 10,000 word basis. For example, if a given work has 10,000 total words and contains 100 instances of mental language, the MLD would be .01 (i.e., .01 MLD = 100 [uses] / 10,000 [total word count]). In other words, ‘minds’ in ‘Homer’ was mainly measured by MLD, or the frequency of words related to mental activity in comparison to the entire word count.

3.3.2. Mental Language Glossary (MLG). The terms selected as indicative of mental action were initially derived from the Raskovsky et al. (2010) study aforementioned, then wholly revised to be more comprehensive. Together, 70 word stems and their derivative variants made up the Mental Language Glossary (MLG). The word stems selected in the MLG were used to collect word frequencies in the texts in order to compute the MLD of each work, as stated above (see Table 10). Selection of words for the MLG was the most impactful component of the present study’s outcome.

3.3.3. Vocabulary Density (VD). The construct of vocabulary density (VD) refers to the lexical richness a translator exercised in the course of translating both the *Il.* and *Od.* These vocabulary differences may reflect stylistic choices or other considerations. VD was operationalized by counting how many unique words the translator used in comparison to the total word count, thereby constituting a ratio variable. For example, a given work may have 1,000 words, of which 500 are unique. The VD of this work would be .5 (i.e., .5 VD = 500 [unique words] / 1,000 [total words]).

[39] *JASP* is a free, open-source, downloadable software package used for conducting statistical analyses (https://jasp-stats.org).

Table 10

Words Denoting Mental Action in Mental Language Glossary (MLG)

As action			As object[c]			As state or quality		
Term	Rank[a]	Count[b]	Term	Rank[a]	Count[b]	Term	Rank[a]	Count[b]
know+	62	3385	thought+	179	1759	wise+	170	1830
think+	124	2300	counsel+	339	1023	resourceful+	707	536
knew+	329	1057	council+	869	434	cunning+	1004	375
plan	651	579	advice+	950	397	pruden+	1427	263
plans			wisdom+	1058	357	brillian+	1460	257
plann+			purpose+	1086	350	crafty	1989	180
question+	1027	369	reason+	1356	276	sensibl+	2028	177
persua+	1389	271	+wit+	1612	230	clever+	2692	123
doubt+	1490	251	wiles	1810	202	wily	3481	88
divid+ (-)	1571	235	plot+	2213	157	intelligen+	4350	63
inten+	1626	227	guile+	2863	114	senseless+	4789	55
believ+	1773	206	trick+ (-)	2873	114	judic+	5672	42
+agree+	1823	199	decision+	4945	52	smart+	6079	38
consider+	1861	195	tactic+	5367	46	uncertain+	7022	30
heed+	1893	191	nonsense	5596	43			
ponder+	1938	186	opinion+	5951	39	**As location**		
understand+	2164	163	decepti+	6205	36			
suppos+	2196	159				heart+ (-)	10	8369
devis+	2261	154				mind+	86	2812
decid+	2319	149				brain+ (-)	2336	147
judg+	2576	130						
imagin+	3232	97						
decei+	3456	88						
consult+	3490	87						
understood	4479	61						
choos+	4748	55						
debat+	4812	54						
sway+ (-)	4851	54						
resolv+	4905	53						
suspect+	5536	44						
convinc+	5738	41						
dissuad+	7241	28						
contriv+	7709	25						

Note. Based on entire corpus of 34 works—half *Il.*, half *Od.*—from the same translators. The “+” sign denotes additional forms to that position of the word. E.g., “mind+” includes “minded,” and “+wit” includes “outwit.” The “(-)” symbol notes that the term required manual sorting of words in order to determine if it was applicable (cf. the Procedure for more details about how and why these words were selected).

[a] Word frequency rank from entire corpus of ca. 40,000 unique words. [b] Minimum number of times the word stem base appeared in the entire corpus of ca. 2,000,000 words (including repeats). [c] Not grammatical ‘object.’

3.3.4. Translation Style (TS). The construct of Translation Style (TS) refers to the translator’s stylistic choice of translating the *Il.* and *Od.* into verse or prose. Prose denotes translations delivered in full blocks of text as opposed to verse, which is organized line-by-line via syllable count or another metrical arrangement. This artistic choice was operationalized as a categorical factor (1 = verse; 2 = prose). All translators utilized either prose or verse for both of their translations.

3.3.5. Translation Order Anchoring (TOA). The construct of Translation Order Anchoring (TOA) refers to the potential impact of translating one work first as opposed to the other; and, what influence that may have unto the observed MLD for the second work. For example, translators who first completed the *Il.* may have then translated the *Od.* with a bias for more mental language, or vice-versa. TOA was operationalized by dummy-coding the works as categorical values based on the earliest available publication date located (0 = both in same year; 1 = *Il.*; 2 = *Od.*).

3.4. Results

3.4.1. MLD Differences Between the *Il.* and *Od.* A paired-samples *t*-test was conducted to compare the mean MLDs of the *Il.* and *Od*. across 17 translators. There was a significant difference in the mean MLDs for the *Il*. (M = 68.2, SD = 8.9) and *Od.* (M = 91.9, SD = 11.6) conditions; $t(16) = -17.798$, $N = 17$, $p < .001$, $d = -4.317$. These results suggest that the frequency of mental language used in the *Il.* is significantly less than the *Od.* The unusually large effect size ($d = -4.317$) further suggests that the MLD difference is consistent within and between the translators. This consistency is also reflected in the mean MLD value ranges between the two works: 47.9–80.5 (*Il.*) and 74.6–110.9 (*Od.*). These results aligned with hypotheses 3 and 4, which predicted that mean MLDs would be higher in the *Od.* than the *Il.*, and that the difference between the group means would be greater than 2 standard deviations. Consequently, it is extremely unlikely that the translators used such mental language word frequencies for each work by chance.

3.4.2. Correlations Between MLD and Other Factors. Pearson correlation coefficients were computed to assess if mean translator MLD was associated with stylistic choices by the translators: vocabulary density, translation style, and translation order. A correlation was observed between translation order and translation style, $r = 0.57$, $N = 17$, $p = .017$, as well as between mean MLD and MLD Δ, $r = -.52$, $N = 17$, $p = .033$. However, neither of these

relationships were relevant for the present investigation. No other significant relationships were observed (see Table 11). These results provide support for the hypothesis that the MLD differences between the *Il.* and *Od.* are unlikely to be the result of artistic choices on behalf of the translators.

Table 11

Mental Language Density and Other Factors – Correlations Table

Variable	*M*	*SD*	1	2	3	4	5
1. Mental Language Density (MLD)	80.0	7.1	—				
2. Mental Language Density Delta (MLD Δ)[a]	-23.7	10.0	.03*	—			
3. Vocabulary Density	.059	.010	.31	.91	—		
4. Translation Order	—	—	.67	.66	.41	—	
5. Translation Style	—	—	.79	.83	.16	.02*	—

Note. $N = 17$.

[a] This value was computed by subtracting the MLD value from the *Il.* by the MLD value from the *Od.*

* $p < .05$.

3.4.3. Additional Tests for Covariance. A one-way between-subjects ANCOVA was calculated to examine the difference between verse and prose translation styles on average MLD whilst controlling for vocabulary density. There was no significant effect of translation style on average MLD whilst controlling for vocabulary density, $F(1,14) = .009$, $p = .925$, $\eta_p^2 < .001$. A secondary ANCOVA was conducted with respect to differences in translation order whilst controlling for vocabulary density. This, too, was not significant, $F(2,13) = 2.836$, $p = .095$, $\eta_p^2 = .304$. Levene’s test of equality of variances was carried out for both analyses ($p > .05$). These results suggest that translators’ unique artistic choices—style and translation order—did not statistically explain the average translator MLD, even after controlling for vocabulary density. These data, moreover, provide further support that the observed differences in mental language between the *Il.* and *Od.* are not due to stylistic choices by the translators themselves.

4. Discussion

The present study sought out to quantitatively compare the *Il.* and *Od.* with respect to the frequency of words related to mental action—in both Greek and English versions. The study’s design and its computational method was conceptually modeled after the earlier Raskovsky et al. (2010) study. The findings from study 2 support their original results—that is, there seems to be less mental language in the *Il.* than the *Od.* While the Raskovsky et al. (2010) glossary mainly measured word frequencies related to introspection (i.e., instances of *me* and *myself*), the present study focused on verbs and nouns that suggested conscious decision making (e.g., *decide* and *decision*).

4.1. Strengths

The within-subjects study design, sample size, and MLG screening methods were critical for this study’s objectivity. Many translators have translated either part of or a whole Homeric epic. However, this study benefited from only choosing translators who completed both the *Il.* and *Od. in extenso*. The benefit was thus statistical power. Next, the sample size of 34 total works was also a key strength. To recall, the Raskovsky et al. (2010) study only used one translator—Samuel Butler—for both the *Il.* and *Od.* Given the within-translator variability observed, it necessarily follows that a sample size almost twentyfold the larger is superlative. Finally, the combination of manual and algorithmic filtering methods of the MLG was a benefit. That is, computational efficacy was human-supervised before and after the largest reductions in MLG word frequency impact. This laborious process—completed by the present author alone—seemed necessary given the lack of prior empirical evidence concerning the matter.

4.2. Weaknesses

The weaknesses of this study were manifold. Mainly, refinement of the MLG’s filtering schema requires more trained contributors in order to increase inter-rater reliability. Moreover, there seems to be no existing inventory or guidance otherwise with respect to what words constitute “mental language.” Third, there was no reliable computational method of increasing filtering efficacy of the MLG with respect to contextual metaphors. Because the Homeric epics contain some 200,000+ words as a pair, errors and omissions in the MLG were not only possible, but inevitable. Fourth, this study was limited to only Greek and Greek-to-English translations of Homer, thereby inhibiting its findings’ ability to (potentially) generalize across other languages.

A final weakness of this study falls upon the data themselves—and the translators who produced the works—for their portion. That is, the translations of words like *noos*, *phrenes, thymos*, *kradie*, *psykhe*, and others were so variable with the result that there is no clear understanding of these words’ meanings’ in consistent psychological contexts. This is extremely important, thereby meriting an analogy. If an image of a “thing” is shown to 17 educated and sane adults and they are asked to indicate what the “thing” is, we may expect a known and understood object to be labeled consistently. For example, if all 17 respondents say that the “thing” is a heart, there is little doubt whatever as to the veracity of the raters’ conclusions. However, if the responses include varied items like brain, mind, soul, lung, stomach, breast, and ghost, there is a problem. Upon further investigation, to be sure, it would indicate that the people rating the “things” have different understandings of what they are reviewing. Verily, this is one of the problems of ‘minds’ in ‘Homer’; that is, exact translations of single mental language words and instances are heterogenous to a superlative degree, with a minimal amount of within-and-between translator uniformity.

4.3. Implications

The reported findings of these studies have implications for three important Homeric questions related to dating, authorship, and composer psychology. In addition, the methodological implications for future investigators are worthy of note.

4.3.1. Homeric Questions. First, the more frequent use of the *mind* hypostasis over *heart* in the *Od.* suggests that the *Il.* is indeed the older of the two works (based on the analyses of Greek texts). The usage in the *Od.* more closely resembles contemporary uses in the English language. If the hypostatic terms were merging together in the Archaic Greek period, the more recent work would represent more usage of fewer terms while phasing out less used ones. This was the case with the *Od.* Second, the case for multiple authorship of the Homeric epics is supported on account of the observed variability in linguistic conventions related to mental language. With respect to composer psychology, the four-phase consolidation model proposed by Jaynes (1976) is supported. That is, there is evidence to indicate that Greek mentality progressed from multiple concrete terms for sensations towards a unified and abstract notion of *mind* that we think of today.

4.3.2. Computational-Linguistic Approaches. Another important implication of these studies is that computational-linguistic approaches are valuable in better understanding topics

like philology, classics, and the humanities in general. This study could have only been done with data processing tools like *Voyant*. Moreover, even basic computational methods like word frequency analyses seem to yield powerful insights.

4.3.3. Rebranding ‘Homeric Psychology.’ While many prior investigators sought to unify Homeric psychology under a neat framework, the feasibility of this general approach may now be reconsidered. As evidenced in the two studies presented, the *Il.* and the *Od.* are different poems, psychologically speaking. For this reason, it is, perhaps, time to reconsider whether the term ‘Homeric psychology’ ought to be used. This is to say, the results presented suggest that a more profitable path may require abandoning the term ‘Homeric psychology.’ Instead, distinct notions of ‘*Iliadic* psychology’ and ‘*Odyssean* psychology’ may be more appropriate, as the results of these studies would suggest.

4.4. Future Directions

4.4.1. Book-By-Book Analyses and Crowdsourcing. Further work may include book-by-book analyses of mental language within Homer. For example, evaluating the contrasts may provide further evidence for which books are early, middle, and late additions. Moreover, contextual filtering of translation content may benefit from a crowdsourced model, whereby contributors from the Internet can assist with the process of determining which snippets fall into mental language or purely behavioral contexts.

4.4.2. Interdisciplinary Participation. Given that the MLG represented the most important component of the present study, interdisciplinary cooperation from other fields would likely be useful. When developing any list of Homeric words centered around a theme, the matter ought really to be dealt with by philologists and classicists who are highly trained in the nuances of Greek. Given how much contextual filtering was necessary for the present study, contributions from these parties would likely benefit future concerned inquiry. Nevertheless, the computational linguist provides a critical advantage via automation tools and methods—methods that can yield more rapid progress than non-computational approaches. Finally, it is likely the psychologist who is most equipped to draw the line in the sand with respect to what actions constitute conscious mental activity, as differentiated from unconscious mental activity. It follows, therefore, that future work ought to include the intercourse by and between these fields of study, thereby requiring interdisciplinary participation and cooperation. These efforts would collectively help the MLG’s construct validity.

4.4.3. Avoiding Presentism. Within some social sciences, the maxim *ethnocentrism* holds that one should not frame or judge other cultures by ones’ own. This maxim implies that other cultures are constituted differently, and thus hold different standards and beliefs. To neglect this maxim in the field of sociology is injurious, and to observe it is useful. It follows that the field of psychology, too, ought to hold some maxim concerning attribution of mental states unto others. Verily, one does not need training to know that this is a tricky enterprise. For example, while it is well-known that most 3 year-old children do not possess the faculties necessary for complex cognition like planning and understanding metaphors, this has not stopped countless uninitiated parents from treating them like mini-adults. Diachronically, too, this (to my knowledge) unnamed fallacy applies. That is, there appears to be an unwarranted presupposition that all people—psychologically speaking—have always been the same, at all points in history. Jaynes (1976) called this assumption an intrusion to reason, and it rightfully is, as it is indicative of the broader presentism fallacy. This fallacy stipulates that it is intellectually injurious to judge historical figures by means of our own knowledge of the present. Notwithstanding, there does not appear to be such a fallacy termed with respect to psychology and the attribution of mental states. Such a form of presentism—perhaps *mentocentrism* [?]—would suggest that it is unwise to assume the mentality of historical figures without first evaluating the assumptions.

4.4.4. The Case for Female Translators of Homer. Finally, concerned inquiry would benefit from more female translators of Homer. While translators like Emily Wilson have recently completed one of the Homeric epics, as of this writing there is no female translator who has completed both works. This is an important consideration to note. There is, perhaps, some quality unique to male translators that impacted the results observed in this study. More female translators of Homer would allow for inclusion in analyses like the ones in this study.

4.4.5. The Need for a Lexical Register of Mental Language. Future investigators ought to consider investing time in developing a reference work related to the terms, phrases, and constructions unique to mental language.

Enter Homer. The present study examined what a handful of English translators assumed that the Greeks—removed by ca. 3,000 years—were thinking, and where they were doing it, via Homer’s *Il.* and *Od.* If translators did not consider the concerns stated above, they may have had little awareness of their own psychological biases and distortions in interpreting Homer. The debates over Homeric hypostases and within-and-between translator variability of endless

passages lend themselves to the conclusion that ‘minds’ in ‘Homer’ is not one, but many horned problems. To be sure, further progress in understanding the nature of *noos*, *psykhe*, *thymos*, and other Greek terms absolutely requires re-examining the widely accepted assumption that the psychology of man has not changed massively over this important period of human history. This final point applies to future translators of Homer inasmuch as it does to the field of psychology.

References

Adkins, A. W. H. (1970). *From the many to the one*. Cornell University Press.

Almqvist, O. H. (2017). *The Cosmos in the Making: Humans, Gods and Animals in Early Greek Theogonies*. [Doctoral thesis, University of Dublin, Trinity College, Dublin, Ireland]

Altschuler, E. L., Calude, A.S., Meade, A., & Pagel, M. (2013). Linguistic evidence supports date for Homeric epics. *Bioessays*, *35*, 417-420.

Austin, N. (1974). The One and the Many in the Homeric Cosmos. *Arion: A Journal of Humanities and the Classics, New Series*, *1*(2), 219-274.

Autenrieth, G. (1895). *A Homeric Dictionary for Schools and Colleges*. Harper & Brothers.

Baikouzis, C., & Magnasco, M. O. (2008). Is an eclipse described in the *Odyssey*?. *PNAS, 105*(26), 8823-8828.

Blegen, C. W. (1937). *The excavations at Troy, 1932–1937*. Devlet Basimevi.

Bolling, G. M. (1947). Personal Pronouns in Reflexive Situations in the “Iliad.” *Language*, *23*(1), 23-33.

Bremmer, J. N. (1979). *The early Greek conception of the soul*. [Doctoral dissertation, Vrije Universiteit Amsterdam, Amsterdam, Netherlands]

Buonobano, D. (2017). *Your Brain Is a Time Machine: The Neuroscience and Physics of Time*. W. W. Norton.

Burkert, W. (1985). *Greek Religion: Archaic and Classical* (J. Raffan, Trans.). Blackwell. (Original work published 1977)

Bush, J. N. D. (1926). English Translations of Homer. *PMLA*, *41*(2), 335-341.

Cairns, D. (2014). Ψυχή, Θυμός, and Metaphor in Homer and Plato. *Études platoniciennes*, *11*, 1-41.

Clarke, M. J. (1999). *Flesh and Spirit in the Songs of Homer: A Study of Words and Myths*. Clarendon.

Cline, E. H. (2014). *1177 B.C.: The Year Civilization Collapsed*. Princeton University Press.

Constantinidou, S. (1994). The Vision of Homer: The Eyes of Heroes and Gods. *Antichthon*, *28*(1), 1-15.

Darcus, S. M. (1977). “Noos precedes phren in Greek Lyric Poetry.” In *L'antiquité classique*, *46*(1), 41-51.

———. (1979). A Person’s Relation to ψυχή in Homer, Hesiod, and the Greek Lyric Poets. *Glotta*, *57*(1/2), 30-39.

———. (1980). How a Person relates to vóoç in Homer, Hesiod, and the Greek Lyric Poets. *Glotta*, *58*(1/2), 33-44.

Dodds, E. R. (1951). *The Greeks and the Irrational*. University of California Press.

Dörpfeld, W. (1902). *Troja und Ilion. Ergebnisse der ausgrabungen in den vorhistorischen und historischen schichten von Ilion 1870-1894*. Beck & Barth.

Dué, C. (2018). Achilles Unbound: Multiformity and Tradition in the Homeric Epics. *Hellenic Studies Series*, *81*. Center for Hellenic Studies.

Foster, F. M. K. (1918). *English Translations from the Greek: A Bibliographical Survey* (Doctoral dissertation). Columbia University Press.

Fritz, K. V. (1943). ΝΟΟΣ and Noein in the Homeric Poems. *Classical Philology*, *38*(2), 79-93.

Furley, D.J. (1956). The early history of the concept of a soul. *Bulletin of the Institute of Classical Studies*, *3*(1), 1-18.

Gainsford, P. (2012). "Odyssey" 20.356-57 and the Eclipse of 1178 B.C.E.: A Response to Baikouzis and Magnasco. *Transactions of the American Philological Association, 142*(1), 1-22.

Garland, R. (1981). The causation of death in the *Iliad*: A theological and biological investigation. *Bulletin of the Institute of Classical Studies*, *28*(1), 43-60.

Green, P. (2015). *Homer / The Iliad: A new translation by Peter Green*. University of California Press.

———. (2018). *Homer / The Odyssey: A new translation by Peter Green*. University of California Press.

Harris, W. V. (2001). *Restraining Rage*. Harvard University Press.

Herodotus. (2013). *The Histories* (G. Rawlinson, Trans.). Roman Roads Media. (Original work created ca. 450 B.C.E.)

Herskovits, A. (1985). Semantics and Pragmatics of Locative Expressions. *Cognitive Science*, *9*(1), 341-378.

Hood, S. (1995). “The Bronze Age Context of Homer,” 25-32. In Sarah P. Morris (1995).

Horn, F. (2015). Ἔπεα πτερόεντα again. *Hermathena*, *198*(Summer), 5-34.

———. (2016). ‘Building in the deep’: Notes on a metaphor for mental activity and the metaphorical concept. *Greece & Rome*, *63*(2), 163-174.

Hurwit, J. M. (1985). *The Art and Culture of Early Greece, 1100-480 B.C*. Cornell University Press.

Internicola, R. W., & Weist, R. M. (2003). The acquisition of simple and complex spatial locatives in English: a longitudinal investigation. *First Language*, *23*(2), 239-248.

Janko, R. (1990). The *Iliad* and Its Editors: Dictation and Redaction. *Classical Antiquity*, *9*(2), 326-334.

Jaynes, J. (1976). *The origin of consciousness in the breakdown of the bicameral mind*. Mariner Books.

Jeremiah, E. (2010). *The Emergence of Reflexivity in Greek Language and Thought: From Homer to Plato and Beyond* (Doctoral dissertation, University of Melbournce). University of Melbourne Press.

Jones, H. L. (1909). *The Poetic Plural of Greek Tragedy in the Light of Homeric Usage*. [Doctoral thesis, Cornell University, Ithaca, NY]

Kirk, G. L. (1985). “Homer,” 42-92. In *The Cambridge History of Classical Literature: Volume 1, Greek Literature* (E. W. Handley, Ed.). Cambridge University Press.

Korfmann, M. (2004). Was There a Trojan War?. *Archaeology, 57*(3), [May].

Lang, A. (1906). Bronze and Iron in Homer. *Revue Archéologique*, *7*(January-June), 280-296.

Lynch, J. P., & Miles, G. P. (1980). In search of *Thumos*: Toward an understanding of a Greek psychological term. *Prudentia*, *12*(1), 3-9.

Liddell, H. G., Scott, R., Jones, H. S., & McKenzie, R. (Eds.). (1940). *A Greek-English Lexicon. revised and augmented throughout by. Sir Henry Stuart Jones. with the assistance of. Roderick McKenzie*. Clarendon.

Lesher, J. H. (1981). Perceiving and Knowing in the Iliad and Odyssey. *Phronesis*, *26*(1), 2-24.

Lord, A. B. (1960). *The Singer of Tales*. Harvard University Press.

Mallory, J.P., & Adams, D.Q. (1997). *Encyclopedia of Indo-European Culture.* Fitzroy Dearborn.

Martindale, C., & Tuffin, P. (1996). If Homer is the Poet of the *Iliad*, then he may not be the Poet of the *Odyssey*. *Literary and Linguistic Computing*, *11*(3), 109-120.

Monro D. B. (1891). *A Grammar of the Homeric Dialect*. Clarendon Press.

———. (1901). *Homer's Odyssey: Books XIII-XXIV, Vol. II*. Clarendon Press.

Monro, D. B., & Allen, T. W. (Eds.). (1920). *Homer. Homeri Opera* (Vols. 1-5). Oxford University Press.

Morris, J. F. (1983). "Dream Scenes" in Homer, a Study in Variation. *Transactions of the American Philological Association*, *113*, 39-54.

Morris, S. P. (1995). *The Ages of Homer: A Tribute to Emily Townsend Vermeule*. University of Texas Press.

Morrison, J. V. (1999). Homeric Darkness: Patterns and Manipulation of Death Scenes in the *Iliad*. *Hermes*, *127*(2), 129-144.

Nagy, G. (1990). *Greek Mythology and Poetics*. Cornell University Press.

———. (1996). *Homeric Questions*. University of Texas Press.

Nikoletseas, M. M. (2012). *The Iliad - Twenty Centuries of Translations*. CreateSpace.

Onians, R. B. (1951). *The origins of European thought about the body, the mind, the soul, the world, time, and fate.* Cambridge University Press.

Pelliccia, H. (1995). *Mind, Body, and Speech in Homer and Pindar*. Vandenhoeck & Ruprecht.

Powell, B. B. (1991). *Homer and the origin of the Greek alphabet*. Cambridge University Press.

Privitera, S. M. (2015). *Brain, Body, and World: Cognitive Approaches to the Iliad and the Odyssey*. [Doctoral dissertation, University of Edinburgh, Edinburgh, Scotland].

Raskovsky, I., Diuk, C. G., Cecchi, G. A., and Slezak, D. (2010). “The emergence of the modern concept of introspection: a quantitative linguistic analysis.” *Proceedings of the NAACL HLT 2010 Young Investigators Workshop on Computational Approaches to Languages of the Americas*, pp. 68-75.

Russo, J. & Simon, B. (1968). Homeric Psychology and the Oral Epic Tradition. *Journal of the History of Ideas, 29*(4), 483-498.

———. (2012). Re-thinking Homeric psychology: Snell, Dodds and their critics. *Quaderni Urbinati di Cultura Classica, New Series, 101*(2), 11-28.

Russo, R. (2005). The Heart of Steel: A Metallurgical Interpretation of Iron in Homer. *Bulletin for the History of Chemistry, 30*(1), 23-29.

Rutherford, R. B. (1993). From the *Iliad* to the *Odyssey*. *Bulletin of the Institute of Classical Studies*, *38*(1991-1993), 37-54.

Samuels, M., & Samuels, N. (1975). *Seeing with the mind's eye: The history, techniques, and uses of visualization*. Random House.

Schliemann, H. (1875). *Troy and Its Remains: A Narrative of Researches and Discoveries Made on the Site of Ilium, and in the Trojan Plain* (L.D. Schmitz, Trans., & P. Smith, Ed.). John Murray.

Snell, B. (1982). *Die Entdeckung des Geistes* [The discovery of the mind: The Greek origins of European thought]; (T.G. Rosenmeyer, Trans.). Harper. (Original work published 1953)

Snodgrass, A. M. (1971). *The Dark Age of Greece: An Archaeological Survey of the Eleventh to the Eight Centuries BC*. Edinburgh University Press.

———. (1987). *An Archaeology of Greece: The Present State and Future Scope of a Discipline*. University of California Press.

Steiner, G. (Ed.). (1996). *Homer in English*. Penguin Books.

Sullivan, S. D. (1987). ϱαπίδες in Homer. *Glotta*, *65*(3/4), 182-193.

———. (1988). *Psychological activity in Homer: A study of “phrēn.”* Carleton University Press.

———. (1999). *Sophocles, Use of Psychological Terminology: Old and New*. Carleton University Press.

Tyler, W. S. (1894). *The Iliad of Homer: Books XVI-XXIV* (H. Drisler, Ed.). Harper & Brothers.

Vermeule, E. (1979). *Aspects of death in early Greek art and poetry*. University of California Press.

Vico. (2002). *Vico: The First New Science* (L. Pompa, Trans.). Cambridge University Press. (Original work published 1744)

Warden, J. R. (1971). The Mind of Zeus. *Journal of the History of Ideas*, *32*(1), 3-14.

———. (1971b). ΨYXH in Homeric Death-Descriptions. *Phoenix*, *25*(2), 95-103.

West, M. L. (1995). The Date of the *Iliad*. *Museum Helveticum*, *52*(4), 203-219.

Whitley, J. (2001). *The archaeology of ancient Greece*. Cambridge University Press.

Young, P. H. (2003). *The printed Homer: A 3,000 year publishing and translation history of the Iliad and the Odyssey*. McFarland.

Zanker, A. (2019). *Metaphor in Homer: Time, Speech, and Thought*. Cambridge University Press.

Appendix A: Various Tabular Data

Table 12

Top Sixty Mental Language Words and Their Frequencies in the “Iliad” and “Odyssey”

Term	Frequency in *Iliad*			Frequency in *Odyssey*		
	Corpus Total[a]	Mean[b]	WD[c]	Corpus Total[a]	Mean[b]	WD[c]
1. know+	2340	137.6	9.19	2702	158.9	13.36
2. mind+	1829	107.6	7.18	1919	112.9	9.49
3. think+	1466	86.2	5.76	1335	78.5	6.60
4. counsel+	1164	68.5	4.57	616	36.2	3.05
5. thought+	1075	63.2	4.22	1427	83.9	7.06
6. wise+	698	41.1	2.74	1276	75.1	6.31
7. heart+(-)	627	36.9	2.46	689	40.5	3.41
8. knew+	533	31.4	2.09	528	31.1	2.61
9. fool+	508	29.9	2.00	376	22.1	1.86
10. persua+	356	20.9	1.40	140	8.2	.69
11. council+	356	20.9	1.40	154	9.1	.76
12. advice+	269	15.8	1.06	131	7.7	.65
13. judg+	250	14.7	.98	181	10.6	.90
14. brillian+	247	14.5	.97	32	1.9	.16
15. plan	246	14.5	.97	333	19.6	1.65
16. choos+	246	14.5	.97	209	12.3	1.03
17. agree+	238	14.0	.93	167	9.8	.83
18. purpos+	233	13.7	.92	176	10.4	.87
19. ponder+	224	13.2	.88	238	14.0	1.18
20. question+	222	13.1	.87	640	37.6	3.16
21. intent+	211	12.4	.83	164	9.6	.81
22. cunning+	192	11.3	.75	240	14.1	1.19
23. doubt+	177	10.4	.70	234	13.8	1.16
24. reason+	176	10.4	.69	152	8.9	.75
25. decid+	164	9.6	.64	106	6.2	.52
26. devis+	160	9.4	.63	269	15.8	1.33
27. consider+	149	8.8	.59	166	9.8	.82
28. heed+	148	8.7	.58	159	9.4	.79
29. wisdom	143	8.4	.56	218	12.8	1.08

30. plans	142	8.4	.56	184	10.8	.91
31. trick+(-)	131	7.7	.51	164	9.6	.81
32. believ+	126	7.4	.49	148	8.7	.73
33. plann+	125	7.4	.49	266	15.6	1.32
34. sway+ (-)	121	7.1	.48	89	5.2	.44
35. decei+	112	6.6	.44	153	9.0	.76
36. understand+	111	6.5	.44	236	13.9	1.17
37. wits	110	6.5	.43	120	7.1	.59
38. intend+	107	6.3	.42	96	5.6	.47
39. debat+	105	6.2	.41	99	5.8	.49
40. resourceful+	100	5.9	.39	439	25.8	2.17
41. resolv+	87	5.1	.34	65	3.8	.32
42. suppos+	87	5.1	.34	117	6.9	.58
43. pruden+	85	5.0	.33	213	12.5	1.05
44. plot+	81	4.8	.32	319	18.8	1.58
45. wiles	74	4.4	.29	128	7.5	.63
46. imagin+	72	4.2	.28	86	5.1	.43
47. tactic+	70	4.1	.27	35	2.1	.17
48. divid+ (-)	65	3.8	.26	15	.9	.07
49. crafty	62	3.6	.24	118	6.9	.58
50. wit	58	3.4	.23	69	4.1	.34
51. clever+	54	3.2	.21	103	6.1	.51
52. sensibl+	52	3.1	.20	134	7.9	.66
53. contriv+	51	3.0	.20	107	6.3	.53
54. guile+	43	2.5	.17	109	6.4	.54
55. consult+	39	2.3	.15	83	4.9	.41
56. smart+	39	2.3	.15	43	2.5	.21
57. wily	35	2.1	.14	53	3.1	1.8
58. senseless+	35	2.1	.14	22	1.3	.11
59. convinc+	34	2.0	.13	58	3.4	.29
60. intelligen+	34	2.0	.13	72	4.2	.36

Note. $N = 17$.

[a] Corpus Total = total number of times the word appeared in all thirty-four works. [b] Mean = average number of times the word appeared per translation. This was calculated by dividing the Corpus Total by 17. [c] WD = Word Density, or the relative frequency per 10,000 words.

Table 13

Dream Scenes, Deaths, and Metallurgical References in the “Iliad” and “Odyssey”

Difference	Count	
	Il.	*Od.*
Dream scenes[a]	3	4
Deaths[b]	318	
Named	240	
Trojan	188	
Greek	52	
Metallurgical references[c]		
Iron	23	25
Bronze	279	80
	302	**105**

Note: Data compiled by Boban Dedović.

[a] In the *Il.*: 1.605-2.48; 23.58-110; 24.673-95. In the *Od.*: 4.786-5.2; 5.481-6.48; 14.518-15.5; 19.600-20.91. Data derived from Morris (1983); see p. 39f. for a discussion on Homeric dream scenes and p. 54 for a table of dream scene narrative structure.

[b] Data derived from Garland (1981, p. 53).

[c] Data derived from Monro (1901, p. 339).