

# **THUCYDIDES: FATHER OF GAME THEORY**

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This thesis is submitted in fulfilment of the requirements  
for the degree of Doctor of Philosophy

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## **Declaration**

'I, Maria Manuela Wagner Dal Borgo, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.'

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Date: 31.07.2015

## Abstract

### Thesis Title: THUCYDIDES: FATHER OF GAME THEORY

In this thesis, I interpret Thucydides' *History of the Peloponnesian War* utilizing models of game theory to distil the abstract strategic structures that Thucydides illuminates. It is possible by close analysis of the narrative to extract an implicit descriptive theory embedded in the narrative, never made explicit but a consistent presence wherever characters, groups and nations interact. Game theory in its informal structure (i.e. without deploying the full formal apparatus of mathematics) offers a valuable extension to narratology, a narrative theory already successfully introduced into Classical studies.

The thesis studies Thucydides' conception of the *agon* (contest/competition) in its basic framework from simple strategic and dynamic games to games with boundedly rational players. I argue that Thucydides describes a topology of interaction by inferring motivations from observed actions. Chapter 1 and 2 discuss Thucydides' method of reading the minds of historical agents to explore historical causation in simultaneous move and sequential move environments, respectively. Chapter 3 discusses agents with incomplete information and also agents who take irrational decisions. Thucydides allows room in his narrative for players to miscalculate or make conjectures when faced with an interactive environment. He writes history as a description of similar types of potentially recurrent events and sequences linked by a causal chain, whose outcomes are only probabilistically predictable. Whilst analysing different types of interactions, the study aims to explore different game theoretic models based on Thucydides' topology of interaction, in order to identify in the final chapter new research directions for rational actor models as well as stochastic environments for the benefit of political science.

## Table of Contents

<b>Declaration</b>	<b>2</b>
<b>Abstract</b>	<b>3</b>
<b>Table of Contents</b>	<b>4</b>
<b>List of Tables and Images</b>	<b>7</b>
<b>Abbreviations</b>	<b>8</b>
<b>Introduction</b>	<b>10</b>
<b>Methodology</b>	<b>15</b>
Thucydides' Method for Modern theorists	16
<b>Thucydides, Game theory and Narratology</b>	<b>19</b>
Game Theory retells the Story	26
Players, Actions, Preferences and Outcomes	27
Basic Types of Games	30
The first Thucydidean game theorist	31
<b>The Theme of Competition: The Contest (ó áγών)</b>	<b>34</b>
Agon and Medicine	35
Poetic Plot and History: A case for the probable	44
Phases of the <i>agon</i> in Thucydides	48
Structuring the <i>Agon</i>	50
Rationality	53
On common knowledge	58
Exogenous and Endogenous	61
<b>From Narrative to Games</b>	<b>63</b>
Clock, Board and Players	66
Rules and Endgame	67
<b>Chapter 1 – Strategic Games – Normal Form</b>	<b>70</b>
<b>The History as a game</b>	<b>70</b>
<b>Dominance - The First Invasion of Attica (431BC)</b>	<b>74</b>
Players, Actions and Preferences	78
Actions	80
Preferences	81
Preferences and Payoffs	85
<b>Normal form representation</b>	<b>88</b>
Agis, son of Archidamos (411BC)	92
Lamachus' Proposal (415 BC)	93
Demosthenes' Counterfactual (413 BC)	96
<b>Descriptive Theory</b>	<b>98</b>
Types of Strategic Games with Ordinal Preferences	100
<b>Solution Theory</b>	<b>101</b>
<b>Zero-sum Games (Constant Sum Games)</b>	<b>103</b>
The Sea battle in the Great Harbour at Syracuse (413 BC)	104
Ring Composition and Chiasmus	107
The board - Type of battle	108
Players, Actions and Preferences	110
Actions	112
Preferences and Payoffs	116
What then is the <u>preference relation</u> of a fleet?	117

Strategic Game with Cardinal Payoffs (7.70-71)	119
<b>Descriptive Theory (7.70)</b>	<b>119</b>
<b>Solution Theory (7.71)</b>	<b>125</b>
<b>Mixed Strategy</b>	<b>129</b>
Sight and Judgment	131
The Diagnosis of a Worthy Contest	140
<b>Chapter 2 - Dynamic Games - Extensive Form</b>	<b>144</b>
Agon and Law	145
<b>Negotiation</b>	<b>149</b>
The Spartan Negotiation (1.126 - 146)	151
Players, Actions and Preferences	151
Payoffs	155
Escalation	155
Melian Dialogue (5.84-116)	158
Board – Temporal structure	158
<b>Descriptive Theory</b>	<b>161</b>
<b>Solution Theory</b>	<b>162</b>
Melians Reject the Offer	164
<b>Siege Warfare</b>	<b>166</b>
The contest of <i>Wall/ Counter-wall</i> (6.93.4 - 7.6)	168
Preparing to begin the contest	168
<b>The Race of Wall/Counter-wall (6.99 - 7.6)</b>	<b>172</b>
The board	172
Players, Actions and Preferences	174
Players	174
Actions	175
Preferences	176
<b>Phase One of Wall/Counter-wall (6.98.2 - 100)</b>	<b>179</b>
<b>Phase Two of Wall/Counter-wall (6.101-102)</b>	<b>181</b>
Summary of Preferences	182
<b>Phase Three of Wall/Counter-wall (6.103 – 7.6)</b>	<b>184</b>
Shifting Strategies (6.103 – 7.1)	184
Summary of Preferences	186
Wall/Counter-wall Resumed (7.2- 7.6)	187
<b>Duels</b>	<b>187</b>
<b>Descriptive Theory</b>	<b>189</b>
The Mistakes	195
Majority Voting in Classical Athens	199
<b>Majority Voting in Thucydides</b>	<b>200</b>
The Council of War in Thucydides (6.47-50.1)	204
The Council of War	206
Why Alcibiades and not Nicias?	211
<b>Chapter 3 - Incomplete Information, Bounded Rationality</b>	<b>213</b>
First and Second Mover Models	213
<b>Bounded Rationality</b>	<b>236</b>
<b>Anger and Restraint</b>	<b>237</b>
The Mytilene Episode (3.1-3.50)	237
<b>Multiselves model</b>	<b>240</b>
The Speeches	241
Cleon's Speech	242
Diodotus' Speech	243
Anger and Naivete	244
The first as the worst	244

A feasible set	253
First period preferences	253
Second period preferences	254
Rules of Rhetoric	256
The Decision Rule	257
The Period 1 proposal versus the Period 2 proposal	260
<b>Monopolistic environment</b>	<b>261</b>
Case for the sophisticated decision maker	261
Case for the naive decision maker	265
<b>Randomization</b>	<b>287</b>
Cleon's no deterrence	288
Shock wave	290
The Drama	291
The Chance Wind	292
<b>Conclusion</b>	<b>294</b>
<b>Bibliography</b>	<b>296</b>
<b>Appendix</b>	<b>322</b>

## List of Tables and Images

<i>Table 1</i>	88
<i>Table 2</i>	89
<i>Table 3</i>	89
<i>Table 4</i>	100
<i>Table 5</i>	101
<i>Table 6</i>	122
<i>Table 7: Player 1 best responses, Player 2 best responses</i>	123
<i>Table 8</i>	123
<i>Table 9</i>	129
<i>Figure A</i>	68
<i>Figure B</i>	76
<i>Figure C</i>	77
<i>Figure D: Athens – The city and its surroundings</i>	80
<i>Figure E: The Boring Woman</i>	103
<i>Figure F</i>	108
<i>Figure G</i>	110
<i>Figure H: winning, indifferent, losing</i>	128
<i>Figure I</i>	134
<i>Figure J</i>	134
<i>Figure K</i>	135
<i>Figure L</i>	154
<i>Figure M</i>	162
<i>Figure N</i>	174
<i>Figure O</i>	190
<i>Figure P</i>	191
<i>Figure Q</i>	192
<i>Figure R</i>	193
<i>Figure S</i>	193
<i>Figure T</i>	194
<i>Figure U</i>	224

## Abbreviations

Aesch.	Aeschylus
Ain. Tact.	Aineias 'the Tactician'
Aischin.	Aischines
Ar.	Aristophanes
Arist.	Aristotle
Arr.	Arrian
<i>Ath. Pol.</i>	<i>Athenaion Politeia</i> (Athenian Constitution, att. to Aristotle)
bk	book of Thucydides (1 of 8)
Dem.	Demosthenes
Diod.	Diodorus of Sicily
Eur.	Euripides
<i>HC</i>	<i>Historia Conscriptenda</i> , Lucian
Hdt.	Herodotus
<i>Hell.</i>	<i>Hellenika</i> , Xenophon
Hipp.	Hippocrates
Hom.	Homer
Lys.	Lysias
O.	Olympian ode, Pindar
Oxy. Hist.	The Oxyrhynchos Historian
Paus.	Pausanias
Plut.	Plutarch
Pol.	Polybius
Soph.	Sophocles
Strab.	Strabo
Tac.	Titus Livius
Thuc.	Thucydides
Xen.	Xenophon
Alberti	G. B. Alberti, ed. <i>Thucydidis Historiae</i> 3 vols. (Roma, 1972-2000)
Beloch	K. J. Beloch, <i>Griechische Geschichte</i> , 4 vols. in 8, second edn. (1912-27)
Bétant	E.-A. Bétant, <i>Lexicon Thucydideum</i> , 2 vols. (Geneva, 1843)
<i>BNJ</i>	<i>Brill's New Jacoby</i> (online resource, 2006)
Classen/Steup	<i>Thukydides</i> erklärt von J. Classen, bearbeitet von J. Steup, 3 <sup>rd</sup> to 5 <sup>th</sup> edns. (Berlin, 1920-22)
CT	S. Hornblower, <i>A Commentary on Thucydides</i> , 3 vols. (Oxford, 1991, 1996, 2008). Cited as <i>CT</i> 1, 2, 3.
Crawley	<i>Thucydides: History of the Peloponnesian War</i> , tr. R. Crawley (orig. pub. 1874, 1997)
De Ste Croix, OPW	G. E. M. de Ste Croix, <i>The Origins of the Peloponnesian War</i> (London, 1972)

DK	H. Diels and W. Kranz (eds.), <i>Die Fragmente der Vorsokratiker</i> , 6 <sup>th</sup> edn. 4 vols. (Berlin, 1952)
<i>FGrHist</i>	F. Jacoby, <i>Die Fragmente der griechischen Historiker</i> , 15 vols. (Berlin, 1923-58)
Hammond	<i>Thucydides: The Peloponnesian War</i> , tr. M. Hammond (Oxford, 2009)
HCT	A. W. Gomme, A. Andrewes, and K. J. Dover, <i>A Historical Commentary on Thucydides</i> , 5 vols. (Oxford, 1945-81)
IG	<i>Inscriptiones Graecae</i>
LS	H. G. Liddell and R. Scott, rev. H. Stuart Jones and R. McKenzie, <i>A Greek-English Lexicon</i> , 9 <sup>th</sup> edn. (1940), with <i>Revised Supplement</i> (Oxford, 1968)
Marchant	E. C. Marchant, <i>Thucydides Book VI</i> (1897) and <i>Thucydides Book VII</i> (1893)
ML	R. Meiggs and D. Lewis, <i>A Selection of Greek Historical Inscriptions to the End of the Fifth Century</i> , rev. edn. 1988, paperback 1989 (Oxford)
Mynott	<i>Thucydides: The War of the Peloponnesians and the Athenians</i> , tr. J. Mynott (Cambridge, 2013)
OCD	S. Hornblower and A. Spawforth (eds.), <i>The Oxford Classical Dictionary</i> 3 <sup>rd</sup> edn. (Oxford, 1996)
OCT	<i>Oxford Classical Text</i>
Stahl	H. P. Stahl, <i>Thucydides: Man's Place in History</i> . (1966, trans. 2003)
Rood or Rood (1998)	T. Rood, <i>Thucydides, Narrative and Explanation</i> , (1998)
Roscher (1854)	W. Roscher, <i>Principles of Political Economy</i> 2 vols. [ <i>Die Grundlagen der Nationalökonomie</i> , 1854] tr. J. Lalor, 1878 (online resource, 2009). Cited as 1, 2.

Note: All citations from Thucydides are OCT, unless otherwise stated. My translations of Thucydides are often adapted from Mynott; I have also used the other versions cited above.

## Introduction

Game theory and narrative have already met. From operas, like Richard Wagner's *Lohengrin* and *Tannhäuser*, to books like Arthur Conan Doyle's *Sherlock Holmes*, Shakespeare's plays, Goethe's *Faust*, Jane Austen's novels, and Pliny the Younger's letter to Titus Aristo.<sup>1</sup> Most game theoretic applications to narrative text are and have been published by economists or political scientists, very few have been written by scholars who have a close relationship with the text. With respect to classical literature, one event struck me. The political scientist, Steven Brams in 1980 wrote a book called *Biblical Games: Game Theory and the Hebrew Bible*. The "game theoretic" community received it with lukewarm praise saying "he exploits a minimal amount of game theory"<sup>2</sup> or "games quickly begin to sound very much alike"<sup>3</sup>, while literary scholars condemned it. One historian wrote, "Ignore this book!", adding ironically that "we might excuse Brams for not overwhelming the humanists" with mathematical formulae.<sup>4</sup> War on method is human habit. Like the war on method between the historians and the medical writers in the 5<sup>th</sup> century BC,<sup>5</sup> or between political economy and mathematical economics in the 19<sup>th</sup> century,<sup>6</sup> the literary theorists and the game theorists, also, will have a story to tell about their own war on method. Yet with great optimism, this means that more and more scholars are attempting to design new ways to extract games from narrative text. Brams,

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<sup>1</sup> Brief bibliography on game theory and literature: Sir Arthur Conan Doyle's *Sherlock Holmes* by Oskar Morgenstern in 1935 reprinted in Andrew (1976) 174, von Neumann, Morgenstern (2004) 176-178; William Shakespeare's *The Merchant of Venice* by Williams (1966 [1954]) 201-203, *Othello* by Rapoport (1960) 234-241, *Measure for Measure* by Schelling (1960) 140; Pliny's strategic voting by Farquharson (1969) 6-19; Herodotus on Babylonian auctions by Osborne (2004) 81-2; Richard Wagner's *Tannhäuser* by Harmgart, Huck and Müller (2009); *Lohengrin* by Chrissochoidis, and Huck (2010) 65-91; Various writers by Mehlmann (2000); Jane Austen by Chwe (2013).

<sup>2</sup> Jobling (1981).

<sup>3</sup> Cochrane (1988).

<sup>4</sup> Schwartz (1981), see Morley (2004) on the ancient historians' skepticism of modern theories.

<sup>5</sup> Jouanna (2005) 4-5.

<sup>6</sup> Haas (2007) 6, from whom I borrowed the phrase "war of the methods".

far from discouraged, published in 2012, *Game Theory and Humanities: Bridging two Worlds*.<sup>7</sup>

What is Thucydides' role in this struggle for unification? The political economist George Tsebelis dubbed Thucydides "the father of game theory" in a paper called *Thucydides on Nash versus Stackelberg: The importance of the sequence of moves in games*.<sup>8</sup>

"the father of game theory, Thucydides... was interested in explaining the general through the particular [cites 1.22] ... In modern terminology, he was interested in historical questions as a means of finding theoretical answers."

Tsebelis' paper was the first to uncover Thucydides' unique game theoretic assumptions in first-mover and second-mover models. He noted the historian's interpretation of rationality, conscious description of strategic interaction, and most importantly, equilibrium analysis, or how outcomes are calculated. His hypothesis of first-mover or second-mover advantage is discussed using brief sketches of a handful of episodes. Tsebelis, probably for reasons of concision, paid little attention to a close reading of particular events. William Charron, another political scientist, explored rational choice in Aristotle and applied his findings to Thucydides' narrative. His results were innovative, but still the literary analysis was superficial.<sup>9</sup> The classicist Gerald Mara in 2008 took on the challenge of analyzing Thucydides' *Mytilenian Debate* as a "negotiation of preference claims" and found the theory wanting. Mara did not incorporate the competitive elements characteristic of debates in the assembly, foregoing a deeper analysis of the

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<sup>7</sup> This thesis rejects Brams' (2011) presentation of game theory and throughout employs the standard version of game theory (i.e. the most widely used concepts), rather than Brams' Theory of Moves (TOM) whose practicality is still debated, Stone (2001). The level of game theory developed here is called **Proto-game theory** (for the most part). This means that game theory is used for its concepts and formal framework/structure. At times, solutions to Thucydides' narrative description are given with basic calculations of optimal behavior (solutions) to provide the reader with a comprehensive view of the theory. There are no proofs of general theorems. In only a few cases is Low-game theory used, which is an investigation of a specific game and its solution. For an overview, see O'Neill (1989).

<sup>8</sup> Tsebelis (1989) 4.

<sup>9</sup> Charron (2000).

voters changing preferences.<sup>10</sup> Josiah Ober, a classicist/political scientist, in 2009 jumped into this whirling debate, taking rational choice to the next level.<sup>11</sup> He introduced classical readership to such technical terms of games as rationality and utility functions, maximizing expected utility, calculation of optima, coupled with good simple definitions.

This thesis is dedicated to interpreting Thucydides' *History of the Peloponnesian war* utilizing models of modern game theory. With the help of counterfactuals and a close reading of the sequences of actions, I attempt to distill the abstract strategic structures that Thucydides illuminates. A model is an abstraction. It is never 'right' or 'wrong', it is just useful or not. It helps us to "perceive relationships between situations, isolating principles that apply to a range of problems".<sup>12</sup> My research targets a narrative's repetition of particular interactive structures. It allows one to uncover underlying trends in the narrative, understand the decisions and choices made by characters both tactical and strategic and finally to extrapolate from the text the factors which generate success and failure. The model teases out more clearly all those factors, which lead to success and failure within the competitive environments of war and politics. Crudely, it tells us about planning, decision-making and interaction. It privileges the practical factors: psychological (what people think), material (what they have got) and situational (what do they do). In seeking structural similarities, variations and contrasts emerge.

This research investigates how Thucydides represents decision-making processes, privileging Thucydides' evaluation of decisions and strategic thinking. The analysis brings to the fore Thucydides' consistent presentation of decision-making behaviour, in terms of a close reading of the text, which is alive to and interested in exploring its nuances, contradictions and ambiguities. In this way, the analysis seeks to avoid the unfiltered method of

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<sup>10</sup> Mara (2008) 61, see Elster (1984), (2000) for an analogy of Ulysses binding himself when faced with the prospect of irrational behavior as a constraint on preferences.

<sup>11</sup> Ober (2009).

<sup>12</sup> Osborne (2004) 1ff.

extracting various game theory structures from examples of text that can lead to an over-simplification of what the text does, which is not true to the experience of reading. Reading can be a confusing process where we are pulled in many different ways at once, caused to think one thing and then another. This is what makes reading for meaning in Thucydides difficult. The game theoretical analysis prioritizes character experience and intention, combining these pieces of information with the action world of the text to form structured arguments whose assumptions, laid bare, lead to potentially interesting conclusions regarding character intention.

The thesis is structured in four main sections. The first section is on methodology. Divided into three parts, the first part is an overview of the role of game theory in past and present trends in Thucydidean scholarship and the second introduces the areas of primary focus with an overview of such concepts as competition, rationality and common knowledge in Thucydides. The third part is a proposed “how to guide” on how to extract a game from narrative. Chapter 1 introduces the descriptive framework of simultaneous move games and the solution concept of dominance, by means of a well-known and studied example of the Archidamian war. The following example from bk 7 takes us from the simplest presentation of a simultaneous move environment to one of the most-sophisticated expressions of simultaneity in Thucydides, culminating in a zero-sum game with a suggested solution in mixed strategies. Chapter 2 moves on to the descriptive framework of dynamic games and these include negotiation, duels and voting. Chapters 1 and 2 are a selection of examples that demonstrate Thucydides’ commitment to studying an agent’s motivation through a preference-to-action equality or his “revealed preferences”. Thucydides presents agents engaging in equilibrium analysis by means of conditional strategic thinking and counter-factual evaluation. Chapter 3 modifies the game theoretic concept of “incomplete information” to explore Thucydides’ unique formulation of first-mover and second-mover behaviour paying special attention to anticipation in surprise attacks and in trickery. The thesis closes

with a discussion on irrational behaviour or bounded rationality, which is best exemplified by the Mytilene episode in bk 3.

From these examples we may conclude that Thucydides systematically explores through narrative presentation and use of abstraction, the fundamental principles that could produce a rigorous description of interactive human environments: revealed preferences, equilibrium analysis and bounded rationality, whilst adding his own contributions. In his approach to the analysis of interaction, Thucydides is a precursor of modern game theory's theoretical strategic environments, even if terminology and extrapolated theory are absent. Embedded in Thucydides' text is an analytical approach to dynamic situations, which has affinities to and will respond to an approach from a game theoretical perspective.

With respect to literature, games help the reader to get a sense of the deep structure of the text, in terms of authorial selection from a range of options available, and allows one, as long as assumptions are grounded in the text, to explore the choices made by characters. The games and concepts included are presented in the broadly standard sequence found in introductory textbooks to game theory. This is because it is intuitive to discuss initially simple concepts and games with an increasing level of difficulty. The aim of this thesis is two-fold. It is to make the case for Thucydides as the "father of game theory" and also to introduce the classicist to an extension to narratology that presents *games* or what game theorists regard as *arguments with clear assumptions that facilitate rigorous analysis of interaction*.

## Methodology

Game theory should help us to extract Thucydides' unique tropology of interaction, but why is it a new field of interest? What has been stopping us until now? Game theorists are unfamiliar with literary theory, and ancient historians, whose expertise is very close to that of a literary theorist, are unfamiliar with game theory. A structural form of literary theory called narratology has been successfully applied to ancient texts, including Thucydides. Game theory has had a few tries at literature, yet has been generally rejected as reductionist by the literary crowd and too simplistic by the game theory community. I believe this has occurred because serious and more formal attempts to apply game theory to literature have been made mostly by game theorists (economists and political scientists), who had a superficial relationship with the text and almost never consulted the literary experts to elucidate difficult passages. The wealth of knowledge from the data and literary enlightenment available to the game theorists is denied for example by the political scientist Steven Brams, who refers to Bob Dylan's lyrics and Woody Allen to elucidate the biblical story of Abraham and Isaac (*Torah: Gen.22:2*).

"Abraham's faith might have been fueled by his fear of God ... the Bible provides insufficient information.... The element of fear is expressed in the lyrics of Bob Dylan's song, "Highway 61 Revisited" ... "Oh God said to Abraham, "Kill me a son" ... By comparison, here is how Woody Allen injects black humor into the dialogue between Abraham and God: ..."Never mind what I said" the Lord spake. "Doth though [sic] listen to every crazy idea that comes thy way?" "<sup>13</sup>

In the hope that this fate should not befall my own attempt, I give an introductory view of the history of Thucydidean scholarship. Then, I argue that narratology is a helpful guide for a game theoretic journey through

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<sup>13</sup> Brams (2011) 40 ft.9.

literature. I introduce game theory and its mechanisms, and how far we can go with these in a reading of literature. To use just enough to organize the chaos of thoughts and words, without oversimplifying the text where one story fits all. Then follows a methodological introduction returning to Thucydidean scholarship with a thorough overview of the methodological trends in classics and how my work fits into this picture. I finish with a general introduction to the *agon*, or the concept of competition in Thucydides. Thucydides' articulation of the agonistic theme, both competitive and cooperative, makes the *History* a particularly fertile landscape for game theoretic analyses.

### **Thucydides' Method for Modern theorists**

Thucydides is dubbed the father of international relations,<sup>14</sup> father of political science,<sup>15</sup> specifically political realism, 'realpolitik'<sup>16</sup> and here the father of game theory.<sup>17</sup> Perhaps, by way of a 'social scientific' description we need not a discipline, but a statement instead. In 1929, the eminent philosopher and mathematician, Alfred North Whitehead, said of Plato that "The safest general characterization of the European philosophical tradition is that it consists of a series of footnotes to Plato".<sup>18</sup> Thucydides may require something similar. In order to characterize Thucydidean influence, one could say that the social scientific tradition in part consists of a series of footnotes to Thucydides.

One aspect of Thucydides' reception, occasionally taken up but largely neglected, possibly as taboo, is the influence of the *History* in economic thought. Wilhelm Roscher's theoretical reliance on Thucydides is footnoted everywhere in his "Principles of Political Economy" (1854). Roscher was one of the founders of political economy and his school of thought played a

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<sup>14</sup> Gilpin (1984) 290; Bagby (2000) 24.

<sup>15</sup> Robinson (1974) 20; Gustafson (2000) 6; Ober (2006).

<sup>16</sup> Crane (1998) 21; Monten (2006).

<sup>17</sup> First to do so, Tsebelis (1989) 4; Ober, Perry (2014), for Thuc. inventor of behavioral economics, "prospect theorist".

<sup>18</sup> Whitehead (1929) 39.

fundamental role in the formation and divergence of neoclassical economics and economic sociology. In the preface to the first German edition, Roscher is explicitly thankful to Thucydides:

Like that ancient historian, whom I honor above all others as my teacher, I desire that my work should be useful to those, ὅσοι δὲ βουλήσονται τῶν τε γενομένων τὸ σαφὲς σκοπεῖν καὶ τῶν μελλόντων ποτὲ αὖθις κατὰ τὸ ἀνθρώπινον τοιούτων καὶ παραπλησίων ἔσεσθαι, (*Thucydides* I, 22.)<sup>19</sup>

He dedicated two publications to the historian, one on economics “The Life, Labors and the Age of Thucydides” (“Leben, Werk und Zeitalter des Thukydides”) and another a commentary on Thucydides (“Thukydides”). In the *Principles of Political Economy*, he identifies Thucydides’ fundamental economic concept of material power: “There are two bases to all material power, wealth and warlike ability (χρήματα-ναυτικά, according to Thucydides).”<sup>20</sup> One would suspect a Thucydidean influence in the economic theories of the immutable character of human nature and the evolutionary character of economics, as in the later business cycle.<sup>21</sup> Joseph Schumpeter, an influential economist, and Roscher’s successor in many ways, wrote that Roscher was not a political economist at all, but rather an “extremely worthy successor of the English classicists”.<sup>22</sup> Schumpeter in his *History of Economic Analysis* (1954) writes disparagingly that Roscher “conscientiously retailed, in ponderous tomes and in lifeless lectures, the orthodox – mainly English – doctrine of his time.” (809), calling him a “discoverer of forgotten worthies” (95). This distancing was not unique to Schumpeter. More could be said of the roles of Karl Marx, Max Weber, or the *methodenstreit*, “battle of methods”, between Schmoller and Menger, but this is beyond the present scope. Schumpeter wanted to distance himself from Roscher, despite his work being highly influenced by Roscher.

<sup>19</sup> Roscher’s preface signed May, 1854 page viii vol. 1, “Wie einer alte Geschichtschreiber, den ich vorzugsweise als meinen Lehrer verehre, so wünsche auch ich, das meine Arbeit denen nützlich werde...”.

<sup>20</sup> Roscher (1854) 1.90.

<sup>21</sup> Roscher (1854) 1.81-83, 82ff.119.

<sup>22</sup> Priddat (1995) 16.

The focus of Schumpeter's attack was Roscher's 'historical method' itself and he therefore omits Thucydides completely from his *History of Economic Analysis*, replacing him with Plato and Aristotle (54). In classics, Moses Finley followed Schumpeter closely making Thucydides' disappearance almost invisible.<sup>23</sup> Despite the Schumpeterian agenda, with the additional *damnatio memoriae*, the influence of Thucydides' economic thought on Roscher has survived in Roscher's successors.<sup>24</sup>

Thucydides has undoubtedly played a formative role in 20<sup>th</sup> century economics and also political theory and international relations .

Thucydides is one, who, though he never digresses to read a lecture, moral or political, upon his own text, nor enter into men's hearts further than the acts themselves evidently guide him: is yet accounted the most politic historiographer that ever writ.<sup>25</sup>

It is fair to say that since Thomas Hobbes wrote his own translation of the *History*,<sup>26</sup> Thucydides has attracted serious attention from moderns who have attempted time and time again to rename Thucydides' method of inquiry. Most notably an international relations theorist, political realist,

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<sup>23</sup> Saller (2013) 55-56, agrees that "Finley cited repeatedly and approvingly Schumpeter's *History*". To my knowledge no one has yet taken note of the adverse affects Schumpeter's agenda has had on Thucydidean scholarship in terms of economic philosophy.

<sup>24</sup> The question of Thucydides' reception and translation in political science and international relations was the topic of a 2007 research workshop at the University of Bristol entitled "Thucydides' Reception, Interpretation and Influence" part of Neville Morley's *Thucydides' Project*, now published - Harloe and Morley (2012). For Roscher's 'Corchorean' elevation of the *History* as an articulation of modern science, see Morley (2012a) 115-139.

<sup>25</sup> Hobbes' "Vol.8, Chapter: TO THE READERS"; on Thucydides' Corcyrean stasis and the plague episodes as the basis for Hobbes' view on the state of nature, see Brown (1987); Connor (1984) 99; Crane (1998) 258-259; Manicas (1982); Orwin (1988); de Ste. Croix (1972) 26-28.

<sup>26</sup> Thomas Hobbes famously translated *The Peloponnesian War* in 1629, also see Ahrensdorf (2000) 579-593. Hobbes' *Leviathan* is the greatest tribute ever written to another author, his political theory hinges on Thucydides' words: it was "not contrary to human nature, if we did accept an empire that was offered to us, and refused to give it up under the pressure of the three strongest motives, fear, honor, and interest." (1.76.2) Compare Hobbes: "So that in the nature of man, three principal causes of quarrel. First, competition; secondly, diffidence; thirdly, glory. The first maketh men invade for gain; the second, for safety; and the third, for reputation. The first use violence, to make themselves masters of other men's persons, wives, children, and cattle; the second, to defend them; the third, for trifles ..." p.64.

neorealist,<sup>27</sup> then a constructivist,<sup>28</sup> post-modernist,<sup>29</sup> and so on. Although Thucydides is a model for international relations theorists, his work views from afar the world of practical strategic state planning; that is to say, from a wider angle. He is well known for his calendric, institutional and procedural vagueness. This more abstract way of writing cuts through to the dynamics of an engagement, military or political. Thucydides exploits political philosophy<sup>30</sup> through the language of evidence<sup>31</sup> and of Hippocratic medicine<sup>32</sup>. His interests spanned much further than any single discipline would allow, from medicine to rhetoric and then to finance.<sup>33</sup> There is much to explore for the benefit of state-craft, the social sciences and practice.<sup>34</sup>

### **Thucydides, Game theory and Narratology**

Thucydides' narrative structure is that of a dramatic causal plot, interactively static or dynamic, that describes the interdependence of the decisions made by the characters. His narrative is the result of what he believed motivated people to act the way they did. It is impossible to determine what information he alone was privy to as opposed to what information was common knowledge. Generally, knowledge about what others are *thinking* and what *motivates* them is difficult to extract from friends and even harder from enemies. Thucydides has been scrutinized in this light and there is general disagreement on the veracity of his attributions.<sup>35</sup> His motivational attribution is part of a shared approach to psychology that allowed him to infer motivation. Schneider argues that Thucydides often inferred

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<sup>27</sup> Garst (1989); Forde (1995).

<sup>28</sup> Lebow (2001); Thomas (2005).

<sup>29</sup> Connor (1977).

<sup>30</sup> Mara (2008).

<sup>31</sup> Hornblower (1987).

<sup>32</sup> Rechenauer (1991); Cochrane (1929).

<sup>33</sup> On rhetoric: Friedrichs (2000), Woodman (1988), Jorg (2000); on finance: Smith (1940), Kallet-Marx (1993), (2002).

<sup>34</sup> Furia and Kohen (2005) 805-810, Thucydides' has a notorious social scientific appeal as a result of his "causal and explanatory claims" whose division between an immediate cause and an underlying cause for the war (1.23.4-6) reflects "the debate between idealist and materialist approaches to social science in general", see Rhodes (1987) for the seminal article on the causes of the war; contra Bagby (1994) and Welch (2003).

<sup>35</sup> Westlake (1962) 283; Woodhead (1960) 313; Pearson (1947) 56; Huart (1968) 9; Lang (1995) 48-65.

**motivation from an action.**<sup>36</sup> In modern economics this is the idea of “revealed preference”, wherein “the strength of competing feelings is best revealed by a person’s choice”.<sup>37</sup> Consequently, characters think about what other characters are thinking, calculating decisions to arrive at a desired outcome. Lucian writing over half a century later sedimented the belief that the historian is required to record events with impartiality and he importantly does not exclude character calculation. (HC 41)<sup>38</sup> Lucian seems not to have considered this a practice of fiction (τὸ μυθῶδες, HC 42). This style of history was thoroughly explored by Thucydides even where he personally was involved. Thucydides as author, describes Brasidas’ thoughts about what possible actions the Thucydides as character would take (4.105.1).<sup>39</sup>

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This is a “narrative technique that links actions and actors chainwise”.<sup>40</sup> Brasidas, Nicias, Cleon, Demosthenes, Alcibiades and Perdiccas are the characters who are described with “the greatest number of actions participially motivated”. Classicists recently introduced the concept of plupast which elucidated the ancient historian’s tendency to comfortably compare past events with those further still in the past (i.e. the plupast).<sup>41</sup> In these similarities, there are comparisons, and thus differences emerge. The comparison of past perfect and past is a mechanism that was used as a predictive tool. Game theory instead of looking solely at plupast and past, also looks at the present and simple past, to understand the total

<sup>36</sup> Schneider (1974) *passim* esp.37-54, Schneider argues that Thucydides reconstructed motivations in the same way he did speeches, see Stahl (1966) 75-101; Rood 20ft.59; Reynolds (2009) 326-7, on Thucydides’ “causal theory” as part of a general agreement of “Thucydides’ assessment of the reliability of his sign-based judgment”; Tamiolaki (2013) 41-72, for competing views; Porciani (2011) 333, for the classicists view that the search for truth is incompatible with structured thinking, especially not plot and interpretation. Schumpeter (1954) 14, is illuminating on the inevitability of bias invading fact. “Even the most fiercely factual historian, economic or other, can hardly avoid framing an explanatory hypothesis or theory, or several explanatory hypotheses or theories.”

<sup>37</sup> Chwe (2013) 105-107, who discusses revealed preferences with respect to Jane Austen’s characters; also see Schneider (1974) 135ft.303; Rood 66, 162 for Thucydides’ practice of introducing motivations only after the action is taken.

<sup>38</sup> Lucian HC 38-41.

<sup>39</sup> Canfora (2006) 6, “Thucydides says of himself (although attributing the thought to Brasidas) that he was in a position to call upon troops from Thrace as allies to Athens.”

<sup>40</sup> Lang (2005) 50, 48-65; CT 2.161 cautions not to take only partiplices into account for motivation and knowledge.

<sup>41</sup> Greithlein, Krebs (2012).

understanding of how the ancients believed historical characters were able or not to predict the future. Thucydides' *History*, an intellectual feat thoroughly grounded in his time, outlines such a causal theory for interactive environments. It is perhaps with the combination of narratology and game theory that the latter theory can be fully exploited for the benefit of historical narrative.

Narratology is the theory that outlines the principles that govern narrative texts. Game theory is a theory that outlines the principles that govern interactive environments.<sup>42</sup> Narratology is comfortably applied to Thucydides,<sup>43</sup> whereas, evidence of serious game theoretical analysis is rare.<sup>44</sup> Game theory is a primarily cognitive theory, concerned with the description of interactions and also with the agents' ability to process the interaction and predict outcomes.<sup>45</sup> The term **game** is used in its broadest sense, *from* highly regulated games, such as backgammon or chess, *to* more realistic interactions, such as voting in an assembly where speakers compete for votes, or bargaining in inter-state territory disputes, or in the formation of coalitions where individuals seek to cooperate for mutual benefit. In its most abstract form, a game can also describe completely deregulated interactions, like war or civil war (*stasis*). The literary community tends to use the term 'game' inconsistently, such that there is a "definitional flaccidity in literary terms".<sup>46</sup> The game theoretic method proposed in this thesis is meant to correct this.

Narratology nonetheless found its future increasingly bound to the cognitive sciences by the very nature of its inquiry into interaction and perception.<sup>47</sup> In

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<sup>42</sup> For a list of literary works and operas to which game theory has been applied refer to Brams (2011) 6; Lowe (2000) 36, aptly describes the game analogy as 'resilient' that requires merely a "reasonably parsimonious lexicon of basic terms and types".

<sup>43</sup> Hornblower (1992 [2011]); Bakker (1997); Rood.

<sup>44</sup> Tsebelis (1989); Varoufakis (1997); Charron (2000); Mehlmann (2000) *passim*.

<sup>45</sup> von Neumann, Morgenstern (1944) 31ff. for the classical description of rules, actions and "standards of behavior".

<sup>46</sup> Wilson (1990) 79, esp. his footnote 9 for a review of literary scholars who cover only certain aspects of what a game could involve, also 17-23, 72, 75-83.

<sup>47</sup> Herman (2003) 163- 192, on "narrative as a problem-solving strategy" and that "stories constitute tools for thinking", quoting the cognitive scientist, Don Norman: "The powers of cognition come from abstraction and representation: the ability to represent perceptions,

narratological terms, a game is a situation in which characters have points of view, indicating motivation, at a particular point in time. Point of view, also called focalization,<sup>48</sup> acquires an abstract cognitive dimension. “Focalizing and temporal strategies are linked: the important question is, ‘who knows what when?’.”<sup>49</sup> Thucydides brings to the fore the psychological dimensions of knowledge and of conjecture when his narrative describes an internal focalizer (with unlimited access) or an external focalizer (with limited access).<sup>50</sup> Characters with a point of view produce the story, “mediating the events to the reader, but they also act creating the event”.<sup>51</sup> Characters act when they interact with something or someone, as groups or individuals.<sup>52</sup> ‘Doing nothing’ is just as much an action as ‘walking’; actions imply choice, or rather the ability to choose among a set of possible actions. The choices available to a focalizer are often dictated by geography, the spatial constraint.<sup>53</sup> Time can easily substitute for space,<sup>54</sup> but it is important to make the distinction. All forms of interaction can be thought of as a temporally constrained interaction among focalizing characters. This applies even if time is unlimited. The entity who is responsible for decoding this

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experiences, and thoughts in some medium other than that in which they have occurred, abstracted away from irrelevant details... we can make marks or symbols that represent something else and then do our reasoning by using those marks.”

<sup>48</sup> Genette (1972) 203-204, (1983) 43-52, coins the term focalization, separates point of view and voice, ‘who sees, perceives?’ vs. ‘who speaks?'; Meike Bal (1977) 113, alters focalization to include the ‘focalizer’ or the focalizing agent, whose perspective is reflected in these words or phrases?, ‘who evaluates?’ to include an internal and external focalizer, on which point Genette and Bal disagree, Genette (1983) 50-1. I employ Bal’s definition, following de Jong and Hornblower (Rood follows Genette). I occasionally use point of view when the concept fits the narrative, and especially when sight is involved, see Genette (1972) 206, for using focalization instead of point of view to avoid the visual contamination of the concept.

<sup>49</sup> Rood 13, also see 12-14, 20-21 esp. 48f., 294-6; Hornblower (1994) 134-5; Connor (1991), (1984) as the proponent of the reader-response approach to Thucydides, with Rood’s comments (20-21).

<sup>50</sup> Rimmon-Kenan (1983) 73-82 on focalization as perceptual, psychological and ideological facets; Herman (2002) 301-330, theorizes about the unity of external and internal focalizers with what he calls “hypothetical focalization” in which “the *expressed world* counterfactualizes or virtualizes the *reference world* of the text” (310, his italics).

<sup>51</sup> Lowe (2000) 46-47, emphasis mine; Herman (2002) 27-51, (2003) 168, for the shift of narratology and cognitive science from the “representation-processing properties of individuals” ... “to cognition viewed as ‘mediated action’.”

<sup>52</sup> Cities and individuals are interchangeable entities, and these have particular moral outlooks, 4.14, 1.144.3, authorial passage 3.82.2, and 2.8.4 “cities and individuals eagerly supported each side”, Hornblower (1987) 178.

<sup>53</sup> Allison (2011) 131-144, esp. 132 on the five short speeches in Book 4 (76-77 and 89-101) for “the thematic feature that functions to give unity to this group of multi-faceted speeches ... is Thucydides’ interest in land and borders.”

<sup>54</sup> Clarke (2008).

structure is the reader. The reader is the “interpreter of stories” and, one could say exhaustively, “characterizes the interface between stories and their interpreters”.<sup>55</sup> Simon Hornblower, following Irene de Jong,<sup>56</sup> was the first to bring narratology to Thucydidean studies.<sup>57</sup> Tim Rood in his monograph *Thucydides: Narrative and Explanation* (1998) studied Thucydidean focalization, time and space. Nick Lowe in his *The Classical Plot* (2000) introduced narratology to the cognitive-game framework. Lowe formalized the components of a game into focalizers, time and space adding population, clock, board, rules and endgame. This thesis focuses on the game theoretic framework that connects thinking and doing<sup>58</sup> and its unique incarnation in literary description. The identification of focalizers, their perspectives on time and space, and cognitive state reveal the historian’s control over the narrative.

The convergence of game theory and narrative theory needs translation so that the assumptions within the historical narrative may be more easily understood. Paul Ricoeur noted that “Rhetoric governs the description of the historical field just as logic governs argument that has an explanatory value.”<sup>59</sup> The game theoretic method invests rhetoric with a topology of interaction.<sup>60</sup> These structural elements allow the reader to see the explanatory arrangement surface from within the collection of historical facts, i.e. those elements that must be necessarily related to the reader.<sup>61</sup>

Historical discourse in Thucydides, as opposed to that in a modern historian of the ‘real’,<sup>62</sup> betrays a style that at times strives to describe “the prognostic

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<sup>55</sup> Herman (2002) 2-9.

<sup>56</sup> de Jong (1987).

<sup>57</sup> Hornblower (1994 [reprinted 2011]), c.f. Bakker (1997).

<sup>58</sup> See esp. Ober (2008) who connects “democratic knowledge” with “political action”, and his seminal work Ober (2009) 70-84.

<sup>59</sup> Ricoeur (1985) 153.

<sup>60</sup> Ricoeur (1985) 149-156, for a narratological approach to topology in history.

<sup>61</sup> Ricoeur (1985) 142-179, on the craft of the historian as a representation (152, on common objections in the use of the term “representation”), and the subsequent “reduction to the Same, the recognition of Otherness, and the analogizing of apprehension” (157ff.) resulting from the reader’s extensional logic.

<sup>62</sup> Auerbach (1953).

structure of future time”<sup>63</sup> through repetition.<sup>64</sup> If history is a description that is “similar to reality” and not too “unduly complicated”, the historian uncovers “the similarity in the essentials”. This similarity is “restricted to a few traits deemed “essential” *pro tempore*”.<sup>65</sup> Verbal repetition resolves the problem of specification among narrative units and reveals a pattern throughout the narrative.<sup>66</sup> Thucydides may also represent an entire process as a single word,<sup>67</sup> which is particularly obvious when it is a neologism. For Thucydides as writer, it is important to keep in mind “the principle of *varatio* that is the trademark of his style”.<sup>68</sup> Neither the abandonment of consistency in terminology, nor the low statistical recurrence of terms or phrases, precluded Thucydides from describing games. The *description* of a game identifies the specific type of interaction. I am interested in the interaction as *described*, i.e. it is the “model” implied in the text, not the text-external reality, which matters.

A game theoretic *solution concept*, i.e. an algorithm that makes a prediction over possible outcomes, is not explicit in Thucydides, in contrast to the detailed description of interaction and outcomes. With regard to the use and choice of solution concepts<sup>69</sup>; these are helpful in that they afford some sort of prediction of optimal behavior, but are entirely subject to my interpretation as reader. By drawing parallels between narratological techniques and game theory, this study endeavors to contribute to the dialogue among modern disciplines and ancient studies.

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<sup>63</sup> Koselleck (2004) 95.

<sup>64</sup> Dover (1960) 66-68 on authorial choice and stylisitics; Koselleck (2004) 97-99, “the repeatability of history... was masterfully developed in Thucydides *Proomium*.”; on recurrent structural arrangement: Dewald (2005), Hornblower (1987) 36, “there remains much in Thucydides which is inexplicably, repetitious and trivial (i.e. not ‘historically important’ items, as we should say”); Dewald (2005) the first five bks are comparatively paratactic, with dourly organized descriptions of time, location, actions and outcome, in comparison to bks 6, 7 and 8; on recurrent themes and concepts: Allison (1997a) 244.

<sup>65</sup> von Neumann, Morgenstern (1944) 32-33, 33ft.1, on the essentials to formalise a game.

<sup>66</sup> Allison (1997a) 19, 35ff., 249.

<sup>67</sup> Hornblower (2004) 293-4, compares Thucydides and Pindar, who had the ability to compress an entire process into a single word, quotes Pindar who explicitly reveals his intention “to elaborate a few themes amid lengthy [words]” (*Pythian*.9.76-9).

<sup>68</sup> Allison (1997a) xii, 41.

<sup>69</sup> I do not refer to the dominant strategy solution concept, which is readily intuitive. Instead, I refer to solution concepts, which require probabilistic assignments, such as mixed strategies and Bayes’ rule.

One more element, albeit unnatural to the classicist, binds narratology to game theory: the unlikely symbiosis of “algebra” and narrative.<sup>70</sup> Game theory was born as a mathematical language, from the propositions, theorems and proofs of the mathematicians Emile Borel<sup>71</sup> and John von Neumann<sup>72</sup> and the economist Oskar Morgenstern<sup>73</sup>. The compression of ideas and concepts is the single most dominant propeller of mathematics, where an entire philosophical concept can be represented by a symbol like  $\in$  or  $\emptyset$  or  $\sim$ .<sup>74</sup> Narratology also has grappled with the difficulties of abstracting from detail in narrative construction, from Genette’s “pseudo-mathematical formula: 1N/1S”<sup>75</sup> to de Jong’s exquisitely crafted expressions, whose complexity reaches “ $NF_1[NF_2 = C_x[NF_3 = C_p \rightarrow NeFe_3 = C_q]NeFe_2 = C_y]NeFe_1$ ” (i.e. embedded speech).<sup>76</sup> Compression seems to submit to the necessary evil of **symbol**.<sup>77</sup> There are also good arguments against the overuse of symbolic expressions, which may lose sight of the objective and create tautological arguments or conceptual difficulties.<sup>78</sup> Game theory is very much grounded in algebra and probability theory. But the algebra and probability in the thesis is basic, and is used only to help describe ancient proto-formal ideas. Mathematical notation will be introduced as it emerges in the games; a willingness to learn is all that is required.

To be fair, theorists have often assumed Thucydides “to be objective and analytical in modern terms”<sup>79</sup>. At times, these tend to misread or rather

<sup>70</sup> On the theory of narrative and math Doxiadis, Mazur (2012), see Margolin (2012) 505-531, esp. on game theory 526-9.

<sup>71</sup> Borel (1921) (1938), on the notion of a strategic game.

<sup>72</sup> On mini-max theorem: Von Neumann (1928).

<sup>73</sup> Together with von Neumann in *The Theory of Games and Economic Behavior* (1944). There are earlier formal game theoretical insights that have contributed greatly to the current enhancement of the theory. The most noteworthy contributions are Cournot’s model of duopoly (1838) for equilibrium analysis and Hotelling’s spatial model (1929) for voting.

<sup>74</sup> These are defined: (i.e. “is included in”), (i.e. “empty”), and (i.e. “is indifferent to”).

<sup>75</sup> Genette (1980) 114, qtd. in de Jong (1987)xv.

<sup>76</sup> de Jong (1987) 37.

<sup>77</sup> Herman (2012) 471-504, esp. 479ff. for other types of models such as graphs or drawing with visual resemblance.

<sup>78</sup> Herman (2012) 482-3.

<sup>79</sup> Morley (2012b).

mistranslate Thucydides, which leads to theories that are not entirely Thucydidean. Spuriously, in 1811 Thucydides is referenced for the “evil of paper money in Athens”, and recently Colin Powell, the former US Secretary of State, often quoted an equally spurious passage to justify his military strategy.<sup>80</sup> It is still no lesser merit to adopt ideas inspired by him. Many have been and continue to be inspired by Thucydides’ words. As a matter of fact, the founder of game theory John von Neumann, well-read in the history of antiquity, was especially fond of Thucydides’ Melian Dialogue: as a model of rationalist, *realpolitik*, discourse.<sup>81</sup>

### Game Theory retells the Story

In applying game theory to narrative, the first level of simplification is to identify plot as a series of events.<sup>82</sup> A causal chain links events creating a plot. Cause precedes effect temporally. An event is either caused or experienced by actors, to paraphrase Mieke Bal. Translated into game theory terms, a game is caused or experienced by players. Characters are called players and are “agents that perform actions”. A plan of action is called a strategy.<sup>83</sup> A game in narrative, like an event, “is a transition from one state to another”. This implies that the series of events are determined by “the rules controlling human behavior”.<sup>84</sup> Narratology traditionally adopts the actantial model from the French semiotician, Algirdas Greimas.<sup>85</sup> Greimas’ grammatical model is simple, until it reaches higher levels of interaction. Passive and active actor roles distribute power to act in a way

<sup>80</sup> Koselleck (2004) 26 on Athens; Sharlin (2004) 12-28 on Powell; generally see Morley (2013) 9-36, (2014) x, 174 ft.5 for a list of references.

<sup>81</sup> Nagy (1987) trans. by Redei (2005), von Neumann in a letter to Rudolf Ortvay, Feb. 26, 1939. Department of Manuscripts and Rare Books, Library of the Hungarian Academy of Sciences, Budapest, Hungary. copies in the Stan Ulam papers at the American Philosophical Society in Philadelphia.

<sup>82</sup> Lowe (2000) *passim*; Bal (1985) 6-7, on series of events.

<sup>83</sup> It is important to note that the word *strategy* today, i.e. a plan of action, did not convey the same meaning in antiquity. Terms like *strategia*, in the fifth century referred to generalship, office of general, or the commander of troops, rather than an art of strategy, (1.95) or *strategike*, that which is of or for command, one versed in generalship rather than the art of strategic action. It referred to *praxis* not *techne*, that which pertains to the practice of being general not the principles (the art), see Heuser (2010) 4.

<sup>84</sup> Bal (1985) 7.

<sup>85</sup> Greimas ([1966] 1983) on the six structural units called actants. I borrow and translate game theory through Greimas, as a result of following Lowe.

that need not be the one intended by the author.<sup>86</sup> Instead, power is distributed through focalization (focus/voice), which is subject to some restraint, either geographical, institutional, or the like. The versatility of the simple game theory description can be an asset here.

### Players, Actions, Preferences and Outcomes

In this section, I present a brief introduction to the game theoretical method. The following classical description of a game is merged with narratology and explained using various ancient authors and of course Thucydides. With respect to game theory, these ideas are not set in stone, however it is a vital step to first show what is in use today.

There are five parts to a classic game description. These are *players*, *rules*, *actions*, *preferences* and *outcomes*. A **player** is an actor that has a motive, knowledge and the power to act.<sup>87</sup> Actions are restricted by geographical, temporal or any informational constraint the player may be subject to. **Rules** specify what a player is able to do: his **actions**, more accurately called his **feasible actions**. The player is said to have **preferences** over actions<sup>88</sup> if he is capable of making a choice among multiple actions. He may also be indifferent among the actions, and this is still a choice. The combination of two or more players' actions and preferences reveals the set of **possible outcomes**. The description of a game begins with the ordered triple that specifies a set of players, a set of actions and each player's preferences over actions. In narrative, preferences are conveyed to the reader through a player's conditional statements or, equivalently, a probabilistic assessment

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<sup>86</sup> Bal (1985) 204-5.

<sup>87</sup> For non-players in narrative, here an example is useful. **Soldiers** may be said to want to go to battle, they see the enemy mustering, who is ready to meet them, and yet will remain encamped until the general decides to order the attack. The general is the player, not the soldiers, since it is the general who has the power to act. We will see that this is the case in our first example in Chapter 1.

<sup>88</sup> The descriptions of preference and utility follow Martin Osborne's *An Introduction to Game Theory* closely (2004) 4-6. His presentation of the theory is simple and accurate. In varying levels of difficulty, the reader may refer to Kreps (1990a) 17-24, 30ff.; Mas-Colell et al. (1995) Chapter 1, A-B; Rubinstein (2012) 1-10, 12-20, for preferences and utility; Fishburn (1970) for a complete presentation of preference relations.

of his own and his opponent's possible actions. The narrator himself may also provide this information, a "bird's-eye view" of each player's actions and preferences. But in order for preferences to represent action it is intuitive to assume that preferences are *consistent* with actions.

There exist two conditions for a preference-to-action equality to hold. The conditions assume that a player looks at two available actions and that he can decide which he prefers. A *preference relation* is a *complete* and *transitive* binary relation. Let us look at an example. A player is presented with two actions, *a* and *b*. He prefers *a* to *b*. This is a *complete* binary relation<sup>89</sup>. If he also prefers *b* to *c*, then he prefers action *a* to action *c*. This is a *transitive* binary relation. Both completeness and transitivity ensure that the ordering of preferences is *consistent*; so that preferences represent action. Transitivity is merely a natural extension of completeness. I return to transitivity in the chapter on Bounded Rationality.

This way of reading Thucydidean narrative is well suited to ancient notions of choice, as described by G. E. R. Lloyd. He writes, "There is a recurrent appeal in Greek thought to *pairs of opposites* of various sorts ... [These] (e.g. being and not-being, one and many, great and small, like and unlike) appear to be treated as mutually exclusive and exhaustive alternatives in whatever sense or in whatever relation they are used."<sup>90</sup> The binary element is also characteristic of choice: Gorgias' *Defence of Palamedes* imagines that Palamedes sets a series of alternative questions to his judges.<sup>91</sup> Should the bribe be brought 1. by *many* men or by *one* (9) 2. by *day* of by *night* (10) did he commit the crime *alone* or with *accomplices* (11f).<sup>92</sup> The seemingly artificial form of the binary relation was a natural form of reasoning in pre-Platonic and the later fifth and early fourth centuries BC, so much so that

<sup>89</sup> The game theoretic formulation of binary relations is a generalization of Greimas ([1966] 1983) contrary signs, masculine-feminine, beautiful-ugly, evil-good, and so on. Introducing the concept of "choice" allows binary relations to range beyond a negative-positive axis, or rather of differences, so that unknown character valuations are discoverable to the reader and/or author. It also allows characters to be indifferent among choices.

<sup>90</sup> Lloyd (1966) 7-8.

<sup>91</sup> Lloyd (1966) 128ff., more on "series of alternative questions".

<sup>92</sup> Lloyd (1966) 120.

Aristotle called it a “common place of opposites” or “general rule of alternatives”, τόπος... ἐκ τῶν ἐναντίων (*Rhet.2.23*). The culmination is the Socratic Dialogue where Socrates’ questions require a ‘yes’ or ‘no’ answer for the most part. Binary relations and binary decisions are pervasive in Thucydides as well.<sup>93</sup>

Further, given Thucydides’ mannerist description of player motives, preference relations are readily identifiable in the text. A player’s motives are a reflection of the observed historical action. The preference-to-action equality in Thucydides is in fact the most prominent methodological statement of the *History*. There is an instinctive polarity of speech and action, word and deed,<sup>94</sup> calculation and move, λόγος and ἔργον (1.22.1).<sup>95</sup> Thus, Thucydides does not tend to allow a player’s thinking to contradict his actions in the narrative.

The mathematical notation used to “represent” a preference relation is the *payoff function*, also called a *utility function*, which is a function that associates a number to each action. Preferred actions get higher numbers. If there exists a set  $A$  of possible actions, an action  $a$  in  $A$  and an action  $b$  in

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<sup>93</sup> Finley (1942) 44ff. on Protagoras’ introduction of antilogy as “the essence of Thucydides’ early training”. Finley adds, “nothing else can explain the profundity with which the habit of grasping ideas by pairs and in contrast was fixed in his [Thuc.’s] mind. It showed itself later not only in the paired speeches of his *History*, but more pervasively in almost any given paragraph or sentence, being, as it were, the most instinctive, necessary clothing of his thought.”(46).

<sup>94</sup> Cf. *Rhetoric to Alexander*, 30. 6–7 σαφῶς μὲν οὖν δηλώσομεν ἀπὸ τῶν πραγμάτων ἢ ἀπὸ τῶν ὄνομάτων “The clearness of our explanations will be due to the words which we use or to our facts”. Contrast, Thucydides at 1.21.2 in the methodology: words are evidence (*tekmeria*, ἐκ δὲ τῶν εἰρημένων τεκμηρίων) that lead to the clearest indications (*semeia*) of past events ἀπ’ αὐτῶν τῶν ἔργων σκοποῦσι δηλώσει, “it will be clear to those who judge on [present] fact”, that this war is the greatest. Thucydides goes on to constructs ‘clear’ **historical** narrative connecting the two, i.e. the causal mechanism where words **precede** deeds, due to Thucydides’ notion of accuracy, i.e. *akribēia*, implicit at 1.21-22. Also Diodotus (3.42.2) explicitly states that “anyone who maintains that words are not the teachers of deeds must be either a fool or one with some personal interest”.

<sup>95</sup> Parry (1981); Hornblower (2004) 317ff, who intuitively notes that “some philosophers of mind today regard binary oppositions as fundamental to human thinking generally, just as they are to computer technology”. He also cautions that binary relations (pairs), although very prominent in Greek thought, can also include threes, Pindar O.6 pairs, O.7 threes; Lloyd (1966) 113, esp.126ft.1, “In Sextus’ version of the arguments in *On What is Not* is correct, he sometimes introduced in his questions a third alternative, consisting of both opposites together”. Lloyd’s example seems to come dangerously close to describing indifference among alternatives.

$A$  can be represented by a payoff function  $u$ . Preferences are *ordinal*, since we can rank them, but not *cardinal*, since we cannot tell how much one action is preferred to another. The payoff function does not convey how much more a player prefers  $a$  to  $b$ , just that he prefers one to the other.

$$u(a) > u(b) \text{ if and only if the player prefers } a \text{ to } b$$

Osborne notes that a payoff function is literally “a preference indicator function”. The concept of payoffs captures how a player may weigh differently the same amount of money, for example. Ten pounds is more valuable when a man is poor than when he is rich,  $u_{\text{poor}}(10\text{£}) > u_{\text{rich}}(10\text{£})$ . Von Neumann and Morgenstern, who revived the utilitarian moral philosophy with the concept of a utility function, posited that these could also “represent” *cardinal* utility.<sup>96</sup>

### Basic Types of Games

The preferences players’ hold over outcomes reveals the type of interaction players are facing. For every outcome a player may gain something, lose something or be left unaffected by the interaction (the latter can be the result of a gain and loss of equal share). This payoff can be money, power, prestige, safety, or any value quantifiable or not.

When a player *always loses* to the advantage of the other player, the game is **competitive**, or **non-cooperative**. Examples are games with win-lose outcomes, such as wars, sports and board games. When a player *always benefits* to the advantage of the other player, it is a **coordination** game. Examples are games with win-win outcomes, such as driving conventions and walking on the sidewalk. The majority of the games however are those which involve some degree of competition and coordination. The most

<sup>96</sup> For a mathematical derivation of these properties see von Neumann, Morgenstern (2004) 15-29. They trace their construction back to Euclid, positing that such utility measurements are equivalent to the determination of measurements in the physical science, like temperature. The comparisons of preferred and equivalent can be used to determine hotter and colder. vN and M define a “centre of gravity” (21) between the extremities of a line and normalize it, setting the distance from either extremity between 0 and 1. For an axiomatic formulation 617ff.

famous game, Prisoners' Dilemma, is an example. It is always better to coordinate, but the prisoners' incentives force both players to compete. Thomas Schelling distinguished these three types of games as 'pure conflict', 'pure common interest' and 'mixed motive games', which captures the essence of each type nicely.<sup>97</sup>

A final note on game theory and narratology. Game theory terms can be confused with narratological terms. For example, in narratology, to describe more than once what happened once is called iterative. Iteration in game theory requires that the players be the same, and that the interaction be dynamic, i.e. occurring in sequence over time. Narratology allows for different players, time and place, classical game theory does not. I will try not to use narratology terms that conflict with those used in game theory, unless they supplement the vocabulary of games. All terms introduced are defined. This will help to prevent confusion.

### **The first Thucydidean game theorist**

Where does this structural approach fit in the search for Thucydides' method? Jacqueline de Romilly, one of the great Thucydidean scholars of our time, in her *Histoire et Raison chez Thucydide* (1956), set the trend for the latter half of the twentieth century. De Romilly begins her work with a caveat, "there is an element in his *History* that differs openly from the habits of modern science"<sup>98</sup>. Thucydides, she says, "has a freedom of reasoning resembling a 'personal analysis'". This statement addresses directly the misconception regarding the historical accuracy of Thucydides account. De Romilly remained under the positivistic umbrella favoring a scientific method, but not a "supremely factual" one. She interpreted Thucydides' narrative as a text of quasi-mathematical rigor, employing demonstration, which necessarily required abstraction that resulted in generalities.<sup>99</sup> She

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<sup>97</sup> Schelling (1960) 88ff.

<sup>98</sup> de Romilly (1956) 21.

<sup>99</sup> de Romilly (1956) 41, 47-8, 180ff; Connor (1984) 2-3; Plutarch is at odds with the vision of Thuc. as a writer of a supreme factual level, Pelling (1992) 10-11; Rood 3, who cites

repeatedly notes the *agonistic* emphasis the *History* lays upon debates, battles and contests of all types. “Thucydides presents action as it is being played out ... a historian of war ... following the debate of two γνῶμαι... [where merging the γνῶμαι] you get an outcome, dramatic [poetic] and exhaustive [mathematical] ... Thucydides reveals the action given their [the actors'] relationship, which escapes the actors themselves.” The reader (*le lectuer*) is the one who sees (*le spectatuer*) and combines the two domains.<sup>100</sup> De Romilly’s *proto game theoretic* insight, on the difficulty that players face when deciphering the game they are in, was also discussed by Anatol Rapoport.<sup>101</sup>

For de Romilly, Thucydides is a modeler “excluding everything irrelevant” (46, 27). “Relations have a rigorous character almost mathematical” (34); “his results being necessary and sufficient. ... It is the coherence of the narrative – from premises to conclusions – which has an air of necessity.” (48) “Everything is built, wanted.”<sup>102</sup> “Verbal correspondence is characteristic of his procedure” and “this repetition, is translated as unity of intention.” (42, 45) Throughout she argues that his instruction is methodological. (13) “The formal particularities of his work define his attitude toward history.” (9) She proceeds to extract Thucydides method, identifying the construction of the interactions in the sphere of action and debate. She calls the wall/counter wall engagement at Syracuse a “duel” (54); “the opposition of two intentions ... alternating action and thought”. The *antilogoi* are deliberative and represent the confrontation of two theses. (222-3) Only through comparison can one judge which argument is

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Pelling. Westlake’s view that Thuc. conversed with the historical figures to describe their thoughts harks back to the “scientific historian”. Grundy (1911) 387-534, as the *ne plus ultra* of the analyst scholarship; HCT v., Appendix 2 “Strata of Composition” 384-444; Rood 16-17, esp. as in 119ft.39.

<sup>100</sup> de Romilly (1956) 58, she writes that Thuc. describes the actions of both Nicias and Gylippus, who are geographically separated, in their respective theatres of action, but when combined result in an outcome (*resultat*). She refers to “a single action” (*une seule action*) in the sense of Aristotle’s *Poetics* 1451a31-32, as in a single unity of action.

<sup>101</sup> Rapoport (1960) 239-40.

<sup>102</sup> Examples of de Romilly’s enthusiasm over Thucydides’ apparent rigor abound, with recurrent mathematical metaphors, pp. 12, 34, 41-2, 47-8, 51. And culminates with history being able to “transmettre la vérité de façon aussi sûre qu’une proposition d’Euclide”, 86.

better.<sup>103</sup> In his type of *antilogie en action*, she notes that the “reciprocal intentions of the characters” at Syracuse matches those at the engagement between the Peloponnesians and the Plataeans, who were under siege. (54) He stresses “cause and effect”, she says. Ultimately, as a result of his complex style, she admits he has “failed at such an attempt, from a formal point of view”. Thucydides “invites subtlety, and subtlety accompanies peril”. (86-89)

De Romilly published her book twelve years after the publication of von Neumann and Morgenstern’s *Theory of Games*, and four years before Schelling’s *Strategy of Conflict*. Her work stands as a touchstone for the birth of game theory in literature. Schelling, like de Romilly before him, nonetheless wrote that the *History* is an “unparalleled classic in strategic analysis” such that characters’ “decisions are interdependent”. Schelling using an example taken from Euphemus’ speech to the Camarinaeans (6.82-87) concludes, “The Athenians had to appeal to the Camarinaean interest and, to do this, [Euphemus] analyzed for the Camarinaeans their own interests and capabilities”.<sup>104</sup> The **agonistic theme** is infused throughout the narrative, sometimes explicit other times implicit.

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<sup>103</sup> de Romilly at 222 quotes Herodotus 7.10, γνωμέων ἀντιέων. The character of Thucydides’ method in the paired speeches is of a “comparative and arithmetic character” in parallelisms and echoes (223, 236). This view is the standard definition of unity, see Ellis (1991) 346, “To say that a text has “unity” is to imply that its elements, as defined, are interconnected in one or more ways: very likely, in texts such as ours, by diachronic or logical sequence, but perhaps also or instead by verbal repetition or echo, by resumption of subjects, ideas, or motifs, or by antithesis. Linkages may be of contiguous or uncontiguous elements.”

<sup>104</sup> Schelling (1984) 199-200.

## The Theme of Competition: The Contest (ὁ ἀγών)

In Thucydides' closing remarks to his methodology, he invites the reader NOT to consider his *History* a composition to be entered into a competition (1.22.4).

κτῆμά τε ἐς αἰεὶ μᾶλλον ἡ ἀγώνισμα ἐς τὸ παραχρῆμα ἀκούειν ξύγκειται.

It is an everlasting possession, rather than a prize composition to be heard and forgotten<sup>105</sup>

Why should he emphasize this point?<sup>106</sup> Far too little attention has been given to Thucydides' views on the theme of competition<sup>107</sup> and how this could be part of his promise to be useful (ώφελιμα, 1.22.4). Events in his *History* are undeniably presented as competitive interactions. The war, ὁ πόλεμος, between Athens and Sparta is a contest or as Thucydides calls it ὁ ἀγών (transliterated *agon* [sg.] and *agones* [pl.]).<sup>108</sup> Throughout the *History* other events are also referred to as *agones*. A battle, ἡ μάχη, is an *agon*.<sup>109</sup> Athletic and poetic contests are *agones*.<sup>110</sup> A debate held in the assembly, ἀντιλόγοι, is an *agon*.<sup>111</sup> A public funeral is an *agon*.<sup>112</sup> His focus

<sup>105</sup> CT 1 ad loc. from whom I borrow the translation, noting that ἐς τὸ παραχρῆμα ἀκούειν literally means "heard for the moment".

<sup>106</sup> For potential recitation units which could be performed, see CT 3.31.

<sup>107</sup> See however Hornblower's (2004) groundbreaking study of Pindar's *epinikian* poetry and Thucydides' athletic vocabulary/metaphors revealing Thuc.' careful, conscious and prominent infusion of the athletic theme in the *History*. The ultimate *agon* of war is where opponents submit to social and religious rules of conduct, *nomoī*, see Vernant (1968 [1999]) 13, 27-28; CT 1.388-391, 2.380-385, 3.122-134.

<sup>108</sup> 1.1; 1.70.2 ὁ ἀγών ἔσται; 4.55.2, maritime war ναυτικῶ ἀγῶνι; 5.91.1.

<sup>109</sup> 2.89.8, in Phormio's Speech; 6.68.3 Nicias' pre-battle exhortation. He gives the motivations on both sides, for the Syracusans the *agon* is for their country, for the Athenians the *agon* is not for their country, but they must win otherwise escape will be difficult (death). οἱ μὲν γὰρ ὅτι περὶ πατρίδος ἔσται ὁ ἀγών, ἔγώ δὲ ὅτι οὐκ ἐν πατρίδι, ἐξ ἣς κρατεῖν δεῖ ἡ μὴ ὄφεις ἀποχωρεῖν

<sup>110</sup> 1.6, "in the Olympic games", ἐν τῷ Ὀλυμπικῷ ἀγῶνι; on boxing and wrestling mathches πυγμῆς καὶ πάλης ἀθλα; 2.13.4, on finance and the value of dedicated vessels from religious festivals with athletic and poetic competitions: ὅσα ἵερά σκεύη περί τε τὰς πομπὰς καὶ τοὺς ἀγῶνας; 3.104.3, The quinquennial festival of the Delian Games, athletic and poetic contests, καὶ γυμνικός καὶ μουσικός; 3.104.4-5, quoting the Hymn to Apollo which refers to poetic and athletic (μουσικῆς ἀγῶν, boxing: πυγμαχήν) contests; 3.104.5, the novelty of horse races, τὸν ἀγῶνα ἐποίησαν καὶ ἵπποδρομίας; 5.50.4.

<sup>111</sup> *Agon* as a set-piece debate, Barker (2009) 203-263; debate as *agon* in Thucydides, e.g. Cleon: 3.37.4-5, Diodotus: 3.44. Like Euripides' plays in the 420's, Thucydides seems to evoke "the atmosphere of the courtroom", Lloyd (1992) 36.

<sup>112</sup> Loraux (2001) 37-39 and CT 1.315, on Thuc.' deliberate omission of the *eptiaphios* *agon*. Hornblower (2004) 337, Thuc. uses athletic metaphors in Pericles' *Funeral Oration*,

on the competitive environment ultimately develops into a conscious construction of a 'theory' on the *agon*. Despite his use of the agonistic theme in forensic speeches, public events and battle descriptions, the method he used to collect information to construct his arguments and descriptions may have been borrowed from the medical writers. He investigated the truth (ἡ ζήτησις τῆς ἀληθείας, 1.20.3) by collating pieces of evidence with varying accuracy for the composition of speeches and action (1.22).<sup>113</sup>

### **Agon and Medicine**

The *agon* features frequently in the medical writers.<sup>114</sup> In *Prognostics*, "the physician by his art can combat the disease": τὸν ἰητρὸν τῇ τέχνῃ πρὸς ἔκαστον νούσημα ἀνταγωνίσασθαι.<sup>115</sup> We use the expression to say we are "fighting" a flu even today. Thucydides was an amateur of medicine. He describes the plague of 430 and 427 (2.47.3-54.5; 3.87.1-3) in great detail.<sup>116</sup> During the plague, Thucydides contracted the disease (2.48.3). Wishing to share the experience with his reader, he writes (2.48.2):<sup>117</sup>

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who writes, "The final chapter (2.46) of the Periclean Funeral Oration contains three athletic metaphors in quick succession (στέφανον, σγώνων, ἄθλο), an accumulation all the more striking in view of Thucydides' extraordinary silence about the games which were in reality part of the ritual complex of which the *epitaphios logos* was another part."

<sup>113</sup> CT 1 ad loc. 2.20.1, tr. "difficult though it is to believe every piece of evidence that we look at in turn" (χαλεπά ὅντα παντὶ ἔξῆς τεκμηρίω πιστεῦσαι). Hornblower rightly notes, "This slightly odd phrase seems to mean that we can trust the general sequence without being confident about any individual item." CT 1.56-62, for bibliography and the controversies regarding where his compilation is an idealized record of what was appropriate and what was fact. Hornblower (2004) 291-3, Thuc.' "unusual degree of self-consciousness" of method, unlike Hdt. 7.152.3 who "dropped into a chapter" a methodological remark. On Thucydidean speeches see also Stadter (1973a, 1973b); Stahl (1973); Macleod (1983).

<sup>114</sup> Hornblower (2004) 67-71.

<sup>115</sup> Hipp. *Prog.* 1.14, in Thuc. 2.45.

<sup>116</sup> Rechenauer (2011), esp. (1991), reviews Thuc.' possible relation to medicine, focusing on cause and effect; Leven (1991) 156-60, Morgan (1994) review medical scholarship.

<sup>117</sup> Still, Lucian later employs a similar formula with the intention of writing for posterity, εἴ ποτε πόλεμος ἄλλος συστάῃ (*HC* 5). On the intersects of Thucydides and Lucian, I am indebted to Melina Tamiolaki's paper "Writing for Posterity in Ancient Historiography. Lucian's Perspective" delivered at *Knowing Future Time in and Through Ancient Historiography: 7<sup>th</sup> Trends in Classics Conference*, Thessaloniki, 7-9 June 2013 organized by Jonas Grethlein, Alexandra Lianeri and Antonios Rengakos.

ἐγὼ δὲ οἶόν τε ἐγίγνετο λέξω, καὶ ἀφ' ὧν ἂν τις σκοπῶν, εἴ ποτε καὶ αὖθις ἐπιπέσοι, μάλιστ' ἂν ἔχοι τι προειδὼς μὴ ἀγνοεῖν

I will describe what kind it was, and the indications<sup>118</sup> should anyone see them, if at some time it should attack again, to have foreknowledge to make it possible to recognize it.

Thucydides' intention here is generally believed to be diagnostic with no prognostic intention. He just wished to record it. In a medical text, a doctor answers a common query about the medical practice of writing down cases, or as we shall call it, data collection: "it may be said,... what is the use of enlarging upon cases which are already past remedy?" (Hipp. *On Joints* 58.48):

τὰ δὲ προρρήματα λαμπρὰ καὶ ἀγωνιστικὰ, ἀπὸ τοῦ διαγνώσκειν, ὅπῃ ἔκαστον, καὶ οἵως, καὶ ὅκότε τελευτήσει, ἢν τε ἐς τὸ ἀκεστὸν τράπηται, ἢν τε ἐς τὸ ἀνήκεστον.

Clear and competitive prognostics are made by knowing what way, what sort, and when every case will terminate, and whether it will be converted into a curable or an incurable disease.

The doctor argues that diagnosis implies prognosis. Thucydides' greatest methodological similarity with the medical doctors however is that both describe prediction as a statistic.

ὅσοι δὲ βουλήσονται τῶν τε γενομένων τὸ σαφὲς σκοπεῖν καὶ τῶν μελλόντων ποτὲ αὖθις κατὰ τὸ ἀνθρώπινον τοιούτων καὶ παραπλησίων ἔσεσθαι, ώφελιμα κρίνειν αὐτὰ ἀρκούντως ἔξει.

It will be enough for me if my work is *judged useful* by those people who will want to gain a clear understanding of things that happened in the past and that the human condition being what it is, will one day happen again in suchlike or similar ways.  
(1.22.4)

<sup>118</sup> Read symptoms: the observable causes of the war *aitiai* are referred to in a relative clause as "on the basis of which" (ἀφ' ὧν) at 1.23.5, and here also has a causal sense.

With the accumulation of cases, similarities can be discerned. The future to Thucydides (τῶν μελλόντων) is “the past or contemporary to the reader”.<sup>119</sup> It is vitally important that the reader understand that cases will never be “exactly the same” but instead “similar”.<sup>120</sup> In the *Epidemics* much like in Thucydides, events in the future may be merely “similar”. The doctors closely express the idea that similarities can be discerned and so can differences in the similarities.<sup>121</sup> This is achieved by the collection and analyses of a great number of cases (*Epidemics*, 6.3.12).

Κεφάλαιον ἐκ τῆς γενέσιος καὶ ἀφορμῆς καὶ **πλείστων λόγων** καὶ κατὰ σμικρὰ γιγνωσκομένων ξυνάγοντα καὶ καταμανθάνοντα, εἰ ὅμοιά ἔστιν ἀλλήλοισιν, <αὕτης τὰς ἀνομοιότητας τούτοισιν>, εἰ ὅμοιαι ἀλλήλῃσιν εἰσίν, ὡς τῶν ἀνομοιοτήτων ὅμοιότης γένεται μία· οὕτως ἀν ἡ ὁδός· οὕτω καὶ τῶν ὄρθως ἔχόντων δοκιμασίη, καὶ τῶν μή, ἔλεγχος.

The essential point comes from the diseases’ origins and departures. One summarizes **as many cases as possible** and one’s painstaking analyses of these cases, and discovers whether they are like one another; and one also analyses the dissimilarities, to see if there are patterns of similarity even among the dissimilarities, so that they can be reduced to a single similarity. That is the way of verifying what is correct, and exposing what is wrong.

This practice of aggregating knowledge to find similarities can be seen in practice in Thucydides’ narrative. Interestingly, soldiers at Plataea employ the practice of aggregating knowledge to arrive at the most accurate figure. In the description of the Plataeans, who being besieged, count the number of bricks of the invaders’ wall in order to build a ladder to go over it. (3.20.3-21.1):<sup>122</sup>

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<sup>119</sup> *HCT* i.149.

<sup>120</sup> Cf. 1.140, “same or similar” argument.

<sup>121</sup> I am greatly indebted to C. Pelling for providing me with his paper and handout for his talk at King’s College “Predictability in Hindsight: Hippocrates, Herodotus, Thucydides”, which helped me to understand the connection clearly between the data collection and causal claims of the medical writers and Thucydides.

<sup>122</sup> For the importance of the measurement of the ladder see *CT* 2 ad loc. Thucydides writes that “many counted the layers at the same time and while some were sure to make

They constructed ladders of exactly the right length (ἴσας τῷ τείχει) for the enemy wall. They did this by calculating from the courses of bricks in a section of the wall facing them which happened (ἡ ἔτυχε) not to have been plastered. The counting of the courses was done by many of them at the same time (ήριθμοῦντο δὲ πολλοὶ ἄμα), so that although some might get it wrong the majority would reach the true figure (τινες ἀμαρτήσεσθαι οἱ δὲ πλείους τεύξεσθαι τοῦ ἀληθοῦς λογισμοῦ), especially as they each counted several times and they were not far away (ἄλλως τε καὶ πολλάκις ἀριθμοῦντες καὶ ἄμα οὐ πολὺ ἀπέχοντες), with the wall easily seen (ρᾳδίως καθορωμένου) for their purpose. So in this way they calculated the length of the ladders, estimating measurements (εἰκάσαντες τὸ μέτρον) from the thickness of a brick.

Thucydides noticeably digresses to give the reader a precise description of how to arrive at a mean result, which he describes as an accurate measurement, “a true figure”.<sup>123</sup> The section of the wall is chosen at random (ἡ ἔτυχε), which is reminiscent of pre-Euclidean mathematics where points on a line are often chosen at random (τυχὸν σημεῖον τὸ Z, *Elements* Book 1, Proposition 5).<sup>124</sup> The practice of employing the statistical *law of large numbers* to arrive at precision may have been part of a soldier’s toolkit of practical mathematics.

This process of accumulation of data allowed Thucydides to arrive at more general behavioral conclusion from an accumulation of data, much like

a mistake, the majority were likely. More than one person counts in order to get the number correct (*tou alethous logismou*).

<sup>123</sup> For other such estimations of mean results, τὸ μέσον, 1.10.5, for εἰκάζειν used of conjectural measurements, correct 3.20.4 or incorrect 1.10.2. for σκοττεῖν in methodological statements 1.1.3, 10.3, 10.5, 21.2, 22.4, 2.48.3, 5.20.2., see Rood 105-6.

<sup>124</sup> Esp. Thuc.5.20 on the reckoning of time through winters and summers as opposed to the inaccuracy of reckoning through magistrates - “whether an event occurred in the beginning, or in the middle, or any point (ὅπως ἔτυχε τῷ), of a magistrate’s term of office”; compare to Euc.EL.2.8 “at random”, ὡς ἔτυχε; Euc.EL.3.2 “two points taken at random”, δύο τυχόντα σημεῖα. Cf. HCT i.280-1; Polybius (9.19.5-9) uses examples to evaluate good generalship. One is Nicias’ superstitious reaction to the eclipse of the moon in Sicily and another is the measurement of a ladder to escape a siege, both of which are placed adjacent to each other (suspiciously coincidental?). Generals must have sound knowledge of astronomy and mathematics, respectively.

doctors and mathematicians. For example, in the Corinthians' speech at Sparta, the Corinthians are able to argue that this was a war, an *agon*, between two diametrically opposed types of states (1.70.1):

μεγάλων τῶν διαφερόντων καθεστώτων, ... ούδ'  
έκλογίσασθαι πώποτε πρὸς οίους ὑμῖν Ἀθηναίους  
οὗτας καὶ ὅσον ὑμῶν καὶ ὡς πᾶν διαφέροντας ὁ  
άγων ἔσται.

"when such large differences are at stake... you have not considered ever that you will encounter a war with a sort of people like the Athenians, how widely, how entirely different from yourselves."

The opposing types of force or character of the two states is made early on in the *History* with the "land-sea antithesis" (1.2.2),<sup>125</sup> one strong by land, the other by sea (1.18.2). The competitors have each a type, and how do these types interact? The imbalance in the Greek world was created by the over-growth of one state, whereby another state, whose character was opposed to it, through necessity (*ananke*) responded (1.23.6).

As for the **reason why** (*διότι*) they broke the peace, I have written first the reasons (*aitiai*) and the differences (*diaphorai*), so that no one should ever have to enquire into the origin of so great a war for the Greeks. I regard the truest cause (*prophasis*), which was least apparent in speech, as this: the Athenians, becoming great and arousing fear (*phobos*) in the Spartans, forced (*anankazein*) them into war. The openly expressed causes (*aitiai*) on each side, however, **on the basis of which** (*ἀφ' ὧν*) they broke the peace and began to fight, were the following. (1.23.4-6)<sup>126</sup>

Accumulation of data and careful analysis allow the researcher to identify the unseen causes or perhaps rather to distinguish between cause and occasion. The cause of the war was growth and the fear it caused (1.23.6),

<sup>125</sup> Hornblower (2011) 140f., see there the very important point about Persian omission on account of this two-power war.

<sup>126</sup> Rood 206-210, for the distinction between *aitia* and *prophasis*, see esp. 209ft.16 on ἀφ' ὧν like διότι "has both a causal and temporal sense; it rings with 'as for the reason why they broke the peace ... at the start at 23.5."

not the immediately *observable* breaking of the thirty years truce (λελυμένων λαμπρῶς τῶν σπονδῶν, 2.7.1).<sup>127</sup> There is undeniably an “implicit ethics” which is revealed in “the systematic ethical terminology based on psychoanalysis of the chief springs and motives of human action”.<sup>128</sup> Empirical evidence, gathered in order to understand the decision-making of agents, would appear to precede general moral-behavioral conclusions. In truth, whether the inductive takes priority over the deductive is difficult to say.<sup>129</sup> What is quite clear is that Thucydides was interested in identifying **causal factors** in human interaction.

After Thucydides explanation of the immediate “observable causes”, he begins his account of the underlying least apparent “truest cause”:

The narrative will demonstrate (ἀπόδειξιν ἔχει) the way in which the Athenian empire was established (ἐν οἷς τρόπῳ κατέστη). (1.97.2)

The term *apodeixis* reminds us of Herodotus who also uses *apodeixis* in the Proem to identify a 'proof' through argument. The only other place Thucydides employs the term is to describe how Pericles used arguments to prove that the Athenians would win the war. (ἔλεγε δὲ καὶ ἄλλα οἴάπερ εἰώθει Περικλῆς ἐξ ἀπόδειξιν τοῦ περιέσεσθαι τῷ πολέμῳ.) (2.13.9) This meaning is found again in the *Old Oligarch* (1.1).<sup>130</sup> Nonetheless, the first explicit definition of an abstract rhetorical proof (ἀπόδειξις ὁμορική) comes almost a century later with Aristotle in the form of an enthymeme in the *Rhetoric* (A1 55a5-8).<sup>131</sup> So we arrive full circle from data collection to generalizations from findings. Thucydides does not go so far but does

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<sup>127</sup> On exactly what were these observable causes: Rood 210-215; Heubeck (1980) esp. 229 notes the element of hindsight (Himweis) in explanation; Also, Rhodes (1980); Pearson (1952, 1972, 1986); Kirkwood (1952).

<sup>128</sup> Shorey (1983) 69; other scholars give greater relevance to the moral aspects of the narrative Crane (1998), Williams (1998), and especially Alker (1988) 806, 814, for T. as “morally engaged”.

<sup>129</sup> Marincola (1997) 67-69.

<sup>130</sup> Hornblower (2011) 334 n.29; see Connor (1977) 184, 29 on the *Archaeology* as proof and *epideixis*, cf. Allan (2011) 243f.

<sup>131</sup> Grimaldi (1998) 71.

scratch the surface of explanation as a method requiring knowledge aggregation and extrapolations to arrive at probable conclusions.

Similarities of outcomes in a group of interactions are indicative of likely outcomes. Calculation requires considerations of what is probable (*eikos*). Thucydides does allow agents to calculate by making conjectures. He makes conjectures himself and even invites the reader to make a conjecture without himself following through with the result. As a result of Spartan secrecy, Thucydides gives us their known military arrangement to calculate the size of their army at Mantinea (5.68.3): “from such a calculation it is possible to get a picture of the number of Spartans then present”. Still, conjectures can always be right or wrong.<sup>132</sup>

Considerations of future outcomes are expressed in the form of probable motives, which affect real outcomes.<sup>133</sup> For agents looking into the past, possible alternative outcomes are expressed through counterfactual thinking: “If this had occurred, then that would have happened”. “If-then” statements (*ει - ἄν* statements) come in three forms: past, present or future.<sup>134</sup> This form of historiography is called counterfactual history.<sup>135</sup> Despite its modern controversial status, it was an apparently uncontroversial and, we can speculate, a desirable form of thinking about the course of events. It was used extensively in legal debate as in the recording of history. Counterfactual analysis restricts a character’s calculation of the set of possible outcomes according to the opinion of characters and/or of the narrator-author himself. In the study of historical events, this form of causal claim is used to express BOTH “what might have happened, had something

<sup>132</sup> Rood 105-6, esp. 106ft.97 for terms for conjecturing: *skopein* in methodological contexts (1.1.3, 10.3, 10.5, 21.2, 22.4; 2.48.3; 5.20.2) and *eikazein* for conjectural measurements that are correct (e.g. 3.20.4) or wrong (e.g. 1.10.2). Thucydides conjectures about types of events: *εικάζειν δὲ χρή καὶ ταύτη τῇ στρατείᾳ οἷα ἦν τὰ πρὸ αὐτῆς.* (1.9.3)

<sup>133</sup> Westlake (1958); Woodruff (1994); Wohl (2014) 1-14.

<sup>134</sup> Flory (1988); Tordoff (2014).

<sup>135</sup> Ferguson (1999) 87, Ferguson’s most incisive remark is that “counter-factuals should be those which contemporaries contemplated”; 85, he relegates the ancient historians both Greek and Latin to deterministic historiography from which modernity has sought to distance itself. Counterfactual reasoning he argues is the art of anti-determinists. Bulhof (1999) 21, believes counterfactual history is not necessarily part of whether history is deterministic or not.

else happened AT THE SAME TIME", and also "what might have happened, had something else happened BEFORE" (N.B. never AFTER, since a later event cannot cause a previous event.) The former is a temporal structure, which describes a strategic interaction and the latter is a temporal structure, which describes a dynamic interaction.

Research into historical counterfactuals in ancient history is studied by a handful of scholars.<sup>136</sup> Antagonistic contexts, such as forensic (courtroom) debate<sup>137</sup> and debates on causation among the medical writers often employed counterfactual reasoning for cross-examination and persuasion. From the literary evidence, the first historian to employ counterfactual reasoning was Herodotus.<sup>138</sup> Like Herodotus, Thucydides' counterfactual reasoning<sup>139</sup> is interpreted as a form of *modus tollens* argument, because they create hypothetical pictures.<sup>140</sup> Wakker succinctly states: "At each speech moment the speaker (or narrator)<sup>141</sup> believes p to be no longer realizable, but he nevertheless creates a hypothetical picture in which the realization of p entails the realization of q."<sup>142</sup> The hypothetical picture is usually in the past and the fact in the present, however the hypothetical picture may be in the present and the factual event in the past. The element q is turned into a variable of interest by the historian: in statistics q is called

<sup>136</sup> Greek historiography: Donini (1964), also *HCT* and *CT* ad loc. 7.42.3; Flory (1988); Will (2000); Hornblower (2011) 1-20; Roman historiography: Morello (2002), Suerbaum (1997).

<sup>137</sup> Lloyd (1979) writing down laws required organizing rules systematically and logically and thus contributed to Greek rationality; Asper (2004) argues that the use of law forces litigants to construct arguments inductively and deductively, Gagarin (2008) 106ff.25, on Asper, notes "his interesting argument is flawed by various misconceptions".

<sup>138</sup> Most relevant counterfactuals in *Hdt*.1.91, 120, 191, 174; 2.15, 43, 49, 66, 120; 3.15, 25, 38, 45, 55, 108; 4.140; 5.45, 48, 65, 86, 92, 106; 6.30, 50, 68, 82, 121; 7.3, 10, 120, 139, 168, 229, 143, 165; 8.30, 119; 9.60, 113.

<sup>139</sup> Most relevant counterfactuals and counterfactual implications in Thuc.: 1.3.1-2, 4 implies that if the Greeks had done something in common, they would have had a common name in Homer; 9.1-4 implies that if Agamemnon had not been powerful, there would have not been a war that brought together so many Greeks; also see 1.10, 11, 74, 76, 102; 2.18, 77, 94; 3.33, 74, 75, 82, 84, 113; 4.54, 73, 78, 104, 106; 5.5, 54, 73; 6.61, 78; 7.42; 8.2, 86, 87, 96; Wakker (1994) analyzes a handful; Tordoff (2014) excellent analysis of authorial counterfactuals.

<sup>140</sup> Zhang (2008) 66.

<sup>141</sup> Wakker (1994) 6ff.11, "A speaker is, of course the person speaking or narrating, i.e. the person responsible for the utterance in question." He refers us to de Jong (1987) "for the complex relationship between these three possible speakers [i.e. character, narrator, author] in a literary work."

<sup>142</sup> Wakker (1994) 132ff.

the *explanatory variable* since it ‘explains’ the changes in the other variable.<sup>143</sup>

Chance and calculation are themes which are intertwined with this form of argumentation. Herodotus employs a counterfactual to argue that chance is a deviation from the normal course of events,<sup>144</sup> Thucydides develops throughout the narrative an antithetical relationship between intellect (*gnome*) and chance (*tyche*).<sup>145</sup> Thucydides and his characters possess an intellect that derives conjectures (*eikazein*)<sup>146</sup> from counterfactual reasoning, all the while being subject to chance. Through this rhetorical technique, Thucydides was able to abstract an analogy for the real world. The historian is then able to infer possible outcomes and make causal claims. The counterfactual is a type of conditional statement where “the speaker presents the fulfillment of the condition as no longer possible”.<sup>147</sup> A syllogism effectively creates categories by grouping elements with similar characteristics, without having to count them.<sup>148</sup> This is the basis of nearly all modern mathematics and it is called **set theory**.<sup>149</sup> Predictive models are a natural extension of alternative history, since it is the result of an author

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<sup>143</sup> Zhang (2008) interestingly identifies the use of the counterfactual to explain previous or present periods in rhetorical argument, albeit less formally. See Wakker (1994) 133, 145, hypothetical pictures in the past, e.g. Hdt. 1.120.6, 2.66.1, Thuc.1.9.4.

<sup>144</sup> Hdt. 5.65, He uses a counterfactual to support his argument.

<sup>145</sup> Edmunds (1975).

<sup>146</sup> Hunter (1973) 23-41, most important discussion.

<sup>147</sup> Wakker (1994) 7, and 7ft.13, see also Hunter (1973) 27-30; Wakker (1994) 3, 449, for a complete list of conditionals in Thucydides; Explicit syllogisms/enthymemes in Thuc. 1.9, 2.11.7, 2.42, 45; Zhang (2008) 52-92, 220. Syllogisms require premises drawn from approximation or evidence and need “not [be] from the premises proper to any particular science—such, for instance, as medicine—”, Jebb (1876) vol.2 289; Arist. *An. Pr.* II. 27, συλλογισμὸς ἐξ εἰκότων καὶ σημειῶν. For history as rhetoric: White (1973) 1-38, (1978), (1987), and with ancient historiographers Momigliano (1981), Woodman (1988) 197-212, Hornblower (1994), Rood.

<sup>148</sup> See Thomas Hobbes *Leviathan* Chapter V.1 “Of Reason and Science” showing how arithmetic, geometry and logic use numbers, figures, and words to demonstrate facts using the same operations of addition and subtraction, also IV.14 “the act of reasoning they [the Greeks] they called *syllogism*, which signifieth summing up of the consequences of one saying to another.”

<sup>149</sup> According to Badiou, “semantics have no chance of scientific articulation” unless “it deploys the concept of set, and consequently transforms the notion of [a set’s] domanial multiplicity that the theory of interpretation of a formal system escapes this impotence”. (Badiou 29) “Domanial multiplicity” means that “every set in its universe of discourse is nothing other than either a set of sets, or else the void” Fraser 10-11. “This infinite, unanimous dissonance: A Study in Mathematical Existentialism, Through the Work of Jean-Paul Sartre and Alain Badiou” By Zachary Luke Fraser.

who is forced to persuade his reader with rhetorical argumentation of the recurrent patterns in historical causation (1.22).

### **Poetic Plot and History: A case for the probable**

For Aristotle, the description of causal connections was more often achieved through the art form of epic and tragedy.<sup>150</sup> (*Poetics* 23.1459a) Both poetic forms devise the sequences of things that may occur as plot according to necessity or probability (κατὰ τὸ εἰκὸς ἢ τὸ ἀναγκαῖον, 1451a24-39).<sup>151</sup> Aristotle argues that this is a characteristic more (μᾶλλον) akin to poetry than to history. (1451b7) Thucydides definitely fell within the group of exceptions.<sup>152</sup> A unified causal narrative describes the type (οἶδα) of things that might occur (1451a38, 1451b5), and not only the account of an actual event. Plot or a unified causal narrative is mimetic; it imitates action. (1451a.25) The logical steps from evidence, to conjecture and to necessity (εἰκάζειν or ἀνάγκη) are well known features of Thucydides methodological program.<sup>153</sup> Conjecture is particularly obvious in the *Archaeology* and in the plague narrative, whereas necessity is an explicit feature of the *kinetic* movement from growth to *agon*.<sup>154</sup> Should Thucydides have derived his types from evidence; necessity was a result of near certainty derived from probability.

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<sup>150</sup> Thomas (2011) 229-246.

<sup>151</sup> Arist. *Poetics* 1451b, Herodotus and Thucydides modeled their narratives on epic, especially the *Iliad*, Strasburger (1972), Shrimpton (1997) 21-2, 98-9, Nielson (1997) 27-36, Rutherford (2012). Aristotle's *Poetics* has a reductive view of history as "chronicle narrative", see *Loeb* tr. by S. Halliwell p.117 ft.a (23.1459a21-9). Lowe (2000) 89, regarding Aristotle's evaluation of history at 9.1451b11 and 23.1459a22-23, argues, "History is a discourse of causality and explanation, not a dispassionate chronicle of 'whatever was the case in that period about one man or more'." Aristotle in the *Poetics* is demarcating the territory of philosophy as exclusive to poetic enterprise. Similarly, in the *Rhetoric*. he reduces rhetoric to a *techne*, slandering Isocrates' philosophical rhetoric (*logon paideia*), in order to define philosophy through what it is not, see my abstract at the *APA* website "Rhetoric: Philosophy or *Techne*", Veteikis (2011) expands the abstract into an article.

<sup>152</sup> Hornblower (1987) 9-10, on historical selectivity concludes Aristotle is "simply wrong"; Thomas (2011) 234, writes beautifully, "akrībeia, is a tragic universalism" Two main philosophical characteristics: 1. Gnomic propositions standing in as a generalization: Finley (1967) 110f.; Hornblower (2004) 356. 2. Abstract concepts, even personified concepts: Denniston (1952) 23-40 passim.; Hornblower (2004) 96-7.

<sup>153</sup> Pouncey (1980) 173ft.6, also 184ft.2, Ostwald (1988) esp.21-32 on *ananke*.

<sup>154</sup> Ostwald (1988), on necessity and dynamics, p.38.

The concept of **probability** (*eikos*) is at its core a discussion about **chance** (*tuche*)<sup>155</sup> or **uncertainty from the human point of view**. Probability can be either **calculable** (*kairos*)<sup>156</sup> or **incalculable** (*paralogos*).<sup>157</sup> The ancient Greek attitude toward uncertainty was initially bound to agriculture, commerce and especially to religious practice and the divine.<sup>158</sup> In a competitive context, people believed that the gods could influence one's chances of success or the opponent's chances of defeat. Archaeological finds, like curse tablets called *katadesmoi*,<sup>159</sup> and the literary record show that pre-emptive action could help to tip the gods' balance in one's favor.

The medical writers were bent on the discovery of the *kairoi*, or the phases, of a disease. These were deduced through a doctor's accumulation of **similar cases**. *Kairos* is revealed through a calculation from similarities (*eikota*), or probability, such that the more data the more accurate the reasoning (*logismos*).<sup>160</sup> *Tuche* is more accurately discoverable as a collective assessment than through just one man's assessment. Thucydides

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<sup>155</sup> Cornford (1907) 107, 222, was the first to discuss the distinction between modern probability and the operation of *tuche* in Thucydides. Hacking (1975) 6-7 and Hoffman (2008) 4-5 citing him, argue that probability "as a frequency-based understanding" is a 17<sup>th</sup> century western invention, which was preceded by the Arabic and Indian scholars only by a few centuries. This is because they assume that probability can only be arrived at through mathematics. I find this view to be a condescending view of the ability of the ancient Greeks to grasp the idea of randomness. The passage in book 3 cited above should be sufficient evidence that frequency and conjecture were related concepts, and I need not even mention the medical writers' collection of data to discover similarities. I do agree that to generalize that the term *eikos*, the neuter perfect participle form of the verb *eoika*, should always be translated as "probability" is reductionist, and such translations as "reasonable", "natural" (e.g. see Westlake (1958)) or "similar" should be considered. However, to exclude the notion of probability altogether is ludicrous, which may preclude the development of frontier studies like that of Trédé (1992) on *kairos*, and Eidinow (2007), (2011) on chance and risk which are a testament to the Greek's sophisticated understanding of the benefits and limitations of chance and randomization.

<sup>156</sup> Trédé (1992) *passim*, and T's chilling statement "it was time (*kairos*)" when the Syracusans inaugurate the first sea battle (7.50-54) of the ring composition of book 7, cf. Hdt.8.87.2.

<sup>157</sup> Pouncey (1988) 16, on Pericles and Archidamos, 24, 40, on Pericles who "absorbs *paralogos*", 120, on Brasidas, 124, 168ft.16 for a definition of the "notion of the *paralogos*, the incalculable stroke of chance (*tuche*)"; Edmunds (1975) 207, *passim*; Eidinow (2011) 121.

<sup>158</sup> Eidinow (2007).

<sup>159</sup> Eidinow (2007) 4, "curse tablets act as 'pre-emptive' strikes in competitive contexts".

<sup>160</sup> Trédé (1992) 214-5.

subscribed to this form of intellectual optimism which was common in the second half of the 5<sup>th</sup> century BC.<sup>161</sup>

The historians evolved in a slightly different way. Herodotus distinctively ignored *kairos*, employing it for its most basic temporal meaning as ‘time’, or ‘timing’ only 13 times. Thucydides, who often broke away from Herodotus, employs the term 57 times with both its meanings of ‘decisive timing’ and ‘fatal location’. Still, in the majority of cases it is a temporal indicator. In Thucydides, *kairos* distinguish what the medical writers later went on to call *krisēis*, or critical days. What differentiates the two more drastically is the operation of *tuche*: Herodotus’ oracular, divinatory, fatalistic stance toward luck stands in contrast to Thucydides’ ‘secular’ view of “man’s relationship with uncertainty”.<sup>162</sup>

Unlike human nature (*anthropēia physis*) that is governed by impulse (*orme*), the human condition (*to anthropinon*, 1.22.4) encompasses human nature and chance.<sup>163</sup> Thucydides further refined the *tuche-kairos* relationship we see in Aeschylus: for Thucydides, *kairos* and *tuche* are mutually exclusive.<sup>164</sup> When events are motivated by irrational behavior, as opposed to rational conjecture (prediction and calculation), *tuche* has free reign. Thucydides in most cases equates *tuche* outcomes with outcomes described as *paralogos*, or “beyond calculation”.<sup>165</sup> *Kairos* is part of calculation and the key to success, otherwise victory and defeat are left to

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<sup>161</sup> Trédé (1992) 230, contra Pouncey (1988) who interprets Thucydides’ attitude as pessimistic.

<sup>162</sup> Eidinow (2011) 120, and for the culturally corrected definition of ‘secular’.

<sup>163</sup> Stahl (2003) 29, “Is the category ‘what is human’ (or, as we anticipatorily translated τὸ ἄνθρωπινον... ‘the human condition’) limited to human *nature*? Or does it not rather include (bear in mind here the problem of chance, which lies outside the realm of human nature) the external circumstances affecting human existence, so that we should precisely translate τὸ ἄνθρωπινον by ‘that which pertains to man’, pointing to the human condition in a comprehensive sense?” (his italics).

<sup>164</sup> Trédé (1992) 215, “On serait tenté de dire que chez Thucydide, comme chez Hippocrate, *kairos* et τύχη s’excluent.” *Kairos* and *tuche* are mutually exclusive.

<sup>165</sup> 1.78.1 for equal chance in war; 7.53.1-2, 7.71.7 for the victory of the Syracusans; 2.61.3 for the plague; 3.16, 7.28.3, 8.24.4 for the miscalculation of Athens’ resilience to carry on war; 2.58.2 for a first attempt; Except for 7.61.3, where Nicias sees *tuche* like Aeschylus. Ancient commentators identified Nicias’ passage with the *Iliad* 18.39, which is indicative more of Nicias’ character than of the narrative’s attitude toward chance.

random chance, *tuche*.<sup>166</sup> The two most notable episodes in the latter *tuche* category are the events at Pylos and the sea battle in the Great Harbour at Syracuse.<sup>167</sup> Pericles himself had said that “we tend to blame chance (*tuche*) whenever something turns out contrary to expectation (*para logon*)” (1.140.1).<sup>168</sup> Perhaps Thucydides did not conceive Pericles’ statement to be a rejection of “a vulgar habit of thought”, but instead fully subscribed to equating subjective human miscalculation with objective chance.<sup>169</sup> Thucydides’ definition of random chance suggests a benchmark approach which establishes risk neutrality – equal chance. In the sea battle, spectators who are hopeful or are convinced of a victory are risk loving, whereas spectators who are fearful or are convinced of a defeat are risk averse.<sup>170</sup> The three categories appear also explicitly as cognates of *tuche*: namely *xuntuchia*, *eutuchia* and *dustuchia*.<sup>171</sup> As we can see, behavioural concepts in Thucydides are inextricately linked to his understanding and articulation of probability. All the concepts in Thucydides possess an unusual coherence, “dominated by a principle of processive, systematic, organic unity”,<sup>172</sup> and yet they never reach a rigid system.

<sup>166</sup> Trédé (1992) 220, cf. P. *Pyth.* 9.78.

<sup>167</sup> Trédé (1992) 215-221.

<sup>168</sup> Cf. 1.84.3, 2.61.3, 6.23.3, 67.4.

<sup>169</sup> Stahl (1966) 77, quoting Herter (1953) 617 “die vulgaere Denkgewohnheit”, who in turn refers to Democritus Fr.B119, also Hagmaier (2008) 202-3. As we saw in the Methodology Pericles on envy, Thucydides is apt to disagree completely with Democritean theory, which in this case, “denies chance” (Arist. *Physics* 196a14-15 on Democritus); Herter correctly notes at p.618 that not all *paralogoi* are caused by *tuche*.

<sup>170</sup> See CT 2 ad loc. 1.79.1 for *xunetos* (intelligence) excludes risk; on Thucydides’ as prospect theorist see Ober, Perry (2014) on fear and hope; Lebow (2001) 557; prospect theory as an extension of rational choice theory Levy (1992) (1996), Tversky, Kahneman (1992).

<sup>171</sup> Eidinow (2011) 128-131, 136ff., *xuntuchia* “offers a more neutral description of events” as it signifies “random chance, a rational recognition”: a “pioneering scientific statement ... with its clear recognition... of differing combinations of circumstances (CT 3 ad loc. 6.54.1)”, 1.33.1, 3.45.4, 7.57.1, as surprise 3.82.2, 8.69.4 – found more in narrative than in speeches but also in Thucydides’ own voice (3.82.2, 112.7, 5.11.2); for *tuche* and hope in the context of *eutuchia* 3.97.2, 8.106.5, of Nicias 5.16.1, 6.17.1, 6.11.6, 23.3 – found in speeches and focalizations; for *tuche* and misfortune, betrayal, fear in the context of *dustuchia*, 6.54.1, 55.4, 103.4, 7.86.5, 87.5 – found in the narrative and only once do we here of others talking of *dustuchia*.

<sup>172</sup> Hornblower (2004) 355.

## Phases of the *agon* in Thucydides

On the occasion of the Olympic festival in 420 BC, Thucydides writes that a certain Lichas “was not allowed to compete” (κατὰ τὴν οὐκ ἔξουσίαν τῆς ἀγωνίσεως).<sup>173</sup> (5.50.4) Thucydides here introduces the term ἡ ἀγωνισις, which means “competingness” or “fitness to compete”; a neologism which is a Thucydidean *hapax*.<sup>174</sup> The term is found again only 1000 years later in Procopius to describe “military conflict”.<sup>175</sup> June Allison argues that, with respect to the use of *agonisis*, Procopius “was clearly working to fulfill his desire to have his own history noticeably branded with a Thucydidean stamp”.<sup>176</sup> This is plausible given that Jullius Pollux, in the second century AD, explicitly attributes the term to Thucydides.<sup>177</sup>

*Agonisis* is “an abbreviation of the entire process of entering a game” – the emphasis is on process and not on outcome.<sup>178</sup> Further into the narrative, in the sea battle in the Great Harbour of Syracuse (7.70.3), Thucydides describes the turning point of the battle as ὁ ἀγωνισμός - this term is like *agonisis* a cognate of *agon* and again a *hapax* in classical Greek. *Agonismos* however focuses on product, i.e. on outcome. It describes the

<sup>173</sup> The story goes that Lichas's chariot had won a race in which “he was not allowed to compete” by Olympic law. He was beaten by the umpires for advertising that the chariot was his; Hornblower (2004) 285f, 370-71; (2008) 132, who offers the literal translation “because of the impermissibility of his competingness”. The term was identified as a novelty by Graves. Thought to be Th's invention of the neologism as concept by Allison. Hornblower notes all of the theories, and considers the possibility that it “may be correct official terminology”; The *agon* template is reused in many contexts. Battle and the *agon* are here made to intersect. The law and the *agon* intersect in the Mytilenian debate, Hornblower (2004) 337, Cleon's speech compares judges to athletic contestants (*kritai, agonistai*, 3.37.4).

<sup>174</sup> Hornblower (2004) 50, 285-286, 336-342.

<sup>175</sup> *De bello Gothicō* 8.23.21, 23.35, 30.15, 35.33; *Historia arcana* 1.4; *De aedificiis* 2.1.6, 3.66; for Procopius' Thucydidean style see Allison (1997a) 125.

<sup>176</sup> Allison (1997a) 126, however she insists that the military flavor of the term is not present in Thucydides and “is used in a different sense” by Procopius. The classical Greek association of *agon* with *agonisis* would not have been overlooked, explicit in Jullius Pollux (see footnote below) especially because of the military nature of the Olympic games.

<sup>177</sup> Jullius Pollux 3.151, *apo de agwnos onomata agwnisis para Thoukudidei*.

<sup>178</sup> Allison (1997a) 125, outcome is made secondary in importance, because first the strategist must describe the environment before he can propose possible outcomes, Hornblower (2004) 370-71, For a detailed discussion on the term and its ending in *-sis* as indicative of process.

struggle to take the prize, τὸ ἀγώνισμα.<sup>179</sup> Because of the common use of athletic metaphors in the 5<sup>th</sup> century, Allison rightly notes that “Thucydides describes the scene in language appropriate to sporting events”.<sup>180</sup> Thucydides develops the abstract concepts required to describe competitive environments, the *agon* from process to outcome. He was not unique. Contemporary sophists and poets, developing concepts of their own,<sup>181</sup> appropriated athletic language to express process and outcome in competition.<sup>182</sup>

It is also necessary to note that *agonisis* and *agonismos* are two among many Thucydidean concepts that describe conceptual models through language.<sup>183</sup> Hornblower explains that “Thucydides created a new language, above all a language of abstract nouns, to enable him to talk about concepts”.<sup>184</sup> Thucydides frames competitive environments with the concept of preparation, the contest and the outcome, or rather, ἡ ἀγώνισις, ὁ ἀγών, and ὁ ἀγωνισμός. In this way he separates the before, the during and the after of a contest. Thucydides’ work may not be in a contest (1.22.4), but his work seems to be in part about ‘the contest’. This is perhaps the reason for the prominent mention of prize (*agonisma*) appearing as the final point in his methodology.

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<sup>179</sup> The term is found at 1.22.4 and 7.56; Bakker (2002) notes that *agonisma* is a term that “is usually taken as ‘declamation’ or as ‘competitively presented lecture’”; Allison (1997a) on the relationship among the three nouns, cf. 1.127.

<sup>180</sup> Allison (1997a) 126, uses the term scene not in a narratological sense, Genette (1980) 95.

<sup>181</sup> Abstract theorists were not uncommon. Abstract thought of Pythagoras, Pythagoreans: mathematics, music, Kahn (2001); Concepts of Eleatics: phusis, cosmos; Democritus: psuche, Hussey (1985); Medical writers systematized body of knowledge: disease identification, prognosis, crisis, Rechenauer (1991).

<sup>182</sup> Hawhee (2004) especially for the history of athletic language in rhetoric 27-43.

<sup>183</sup> Schadewalt (1929) and Snell (1975) on *aletheia*; Ostwald (1988) on *ananke*; Cogan (1981b) on *anthropinon*; Edmunds (1975) and Huart (1973) on *gnome*; Hunter (1973) and Stahl on *metabole*; Finley (1967) on *paralogos*; Allison (1989) on *paraskeue* (1997) and on *agon* and terms ending in *-sis* and *-mos*; Rokeah (1963), Immerwahr (1975) and Hunter (1982) on *dunamis*, also see Kallet (1993) 3, Rusten (2011) on *kinesis*, abstract to APA.

<sup>184</sup> Hornblower (2004) 341-42, 370-371, 286, see also Allison (1997a) 123-126.

## Structuring the *Agon*

The *agon* has three phases: the preparation, the interaction itself, and the outcome.

### The Before

In order to be fit to compete (*agonisis*), one must prepare beforehand. In many cases, *askesis* and *paraskeue* are the words used for “the preparation” to enter an *agon*. Preparation for the *agon* is common practice in athletic or military training (5.67), but it also refers to preparation for a psychological competition. An early fourth century epigram in honour of the rhetorician Gorgias records:<sup>185</sup>

Γοργίου ἀσκήσαι ψυχὴν ἀρετῆς ἐς ἀγῶνας|  
ούδεις πω θνητῶν καλλίον ἐύρε τέχνην

No mortal ever discovered a fairer art than  
Gorgias, for exercising the *soul* in the  
contests of virtue.

A very similar notion of contests for virtue as preparation of the *soul* or *psyche* (i.e. for the psychological *agon*) is developed in Pericles' funeral oration. In describing the differences in military training (ταῖς τῶν πολεμικῶν μελέταις)<sup>186</sup> between Athens and Sparta, he notes that the Athenians do not undergo painful preparation (ἐπιπόνω ἀσκήσει) as do the Spartans.<sup>187</sup> The Athenians trust less in preparation (παρασκευή) and trickery than in the courage of the citizens (2.39.1, 2.43.4):

πιστεύοντες οὐ ταῖς παρασκευαῖς τὸ πλέον καὶ ἀπάταις  
ἢ τῷ ἀφ' ἡμῶν αὐτῶν ἐς τὰ ἔργα εύψυχω... τὸ  
εὔδαιμον τὸ ἐλεύθερον, τὸ δ' ἐλεύθερον τὸ εὔψυχον  
κρίναντες μὴ περιορᾶσθε τοὺς πολεμικοὺς κινδύνους.

<sup>185</sup> DK A8, *Epigrammata Graeca* 875a, tr. D. W. Graham, Kaibel 534. Found at Olympia in 1976.

<sup>186</sup> Cf. 1.121.4.

<sup>187</sup> Allison (1989) 45-65, esp. 46-7, on 1.80.3.

We do not trust in preparations and trickery more than in the actions of our own courage. ... we judge happiness to be freedom, and freedom to be courage,<sup>188</sup> to never overlook the dangers of war.

The noun *eupsuchia*, here translated as courage, is connected to the skill of self-control (σωφροσύνης).<sup>189</sup> The Athenians are a match for their opponents regardless of their 'ease' in military training who dedicate themselves with 'labor'.<sup>190</sup> 'Ease' not as 'lack of discipline' or 'consistency', but rather as the entertainment of their regular games throughout the year, to which Pericles himself refers (ἀγῶσι μέν γε καὶ θυσίαις διετησίοις, 2.38.1). Poetic competitions exercised the mind, as Gorgias' epigram attests, just as athletic competition exercised the body.<sup>191</sup> Pericles is in fact replying to a common criticism levelled against Athenian preparation for war.<sup>192</sup>

Allison dedicates a monograph to the topic of *paraskeue* and its cognates entitled "Power and Preparedness in Thucydides", a word rare at Thucydides' time and statistically significant in his work. "Paraskeue refers

<sup>188</sup> See Euripides *Rhesus* 510, where the term *eupsuchos* refers to a man 'thinking'. οὐδεὶς ἀνὴρ εύψυχος ἄξιοι ... "No man in his right mind thinks it worthy to ...", literally, "right-minded man". The term in general is usually translated as courage in Thuc. See Huart (1968) 62, 62.ft.4, 418ff.), who admits this passage is connected to idea of self-control. However in light of Thucydides' affinity with Democritean theory the *psyche* element deserves to be adjusted.

<sup>189</sup> Archidamos at 1.84.3 and 2.11.5, see Huart (1968) 421, generally 418ff. on *andreia* and *eupsuchia* both are terms for "courage". Brasidas at 5.9.1 also connects to *eupsuchon* to freedom, however Huart argues that Pericles means to use courage as descriptive of the generosity of the Athenians, p.422.

<sup>190</sup> It has been noted that "this chapter (i.e. 2.39) is puzzling; its message is that Athenian military arrangements are easy-going and unprofessional by comparison with the Spartan's – not a very encouraging thing to be told, one would have thought." see Hornblower (1991) ad loc.

<sup>191</sup> van Wees (2004) 87-95; Sage (2004) 50-5; cf. 230; Anderson (1970) 85-110; Burckhardt (1996); Rawlings (2000) 233-59; Pritchett (1974) 208-31; Vidal-Naquet (1986); Wheeler, (1982) 223-33, (1983) 1-20; Hornblower (2004) 50, 337, writes, "gymnasia and athletics were a preparation for, or even an alternative to, war"; Sports won battles: Philostratus' *Gymnasticus*, "On Athletics", Thermopylae was won without weapons but with *pankration*, and Marathon with wrestling, it was a citizen's civic duty to have an athletic body that is combat ready, 1.6.

<sup>192</sup> In a dialogue with Pericles, Xenophon writes that Socrates says: "Since the state does not train men publicly for war, on this account, one must not be negligent in private but rather to take no less care (in training)." Xen. *Mem.* 3.12.5. Athenians neglect training like athletes, who always win in one category and so disregard other types of adversaries (*Mem.* 3.5.13-15, 'to be careless' with opponents, also Xen. *Hell.* 6.2). Socrates goes on to compare the Athenians to the Spartans, accusing them of being negligent with their health and mocking those who train their bodies.

both to the abstract state of having power or being powerful, and to the actualization of that power. In this regard it denotes the preparing, the action of collecting the objects of preparedness, be they concrete objects or plans, ideas, emotional states, etc." (e.g. 1.1-2.2, 18-19, 82.3, 6.19.2).<sup>193</sup> In the narrative, the plans or preparations are usually conveyed by *paraskeuai*.

#### The During

The *agon* itself is characterised most commonly by the description of the location, number of participants and a temporal element. The place or location (*topos*) of an engagement is largely dictated by the war narrative, land and sea. On land, the emphasis is on topography and geography (e.g. dry, marshy, steep, flat, sandy). At sea, the focus shifts from the tangible to the wind and weather. Still both land and sea, regardless of terrain and weather, are subject to room for movement or fighting area. Descriptions of the number of participants would likely indicate the actual historical presence, but not always all present will be players in the interaction. A population is a multitude (*to plethos*, e.g. 1.9, 125, 2.98, 8.22), a specific body of people (the *demos*, the "the commons" e.g. 1.20, or "the assembly" *ekklesia*) or restricted numbers of people (the leaders, *ai archai*, the few *oi oligoi*, e.g. 5.84).

#### The After

The description of the denouement of an *agon* in most instances contains trophies, prizes, a final vote or a cessation of communication. The most straightforward description is of a countable vote (*gnome*), the erection of a trophy (*tropaia*) or of the prize at stake (*to athlon*,<sup>194</sup> 3.82, 6.80 and *agonisma*, 7.56.2, 59.2). These refer to the outcome of an *agon*. The

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<sup>193</sup> Allison (1989) 5, 28-9ff., esp. 87.

<sup>194</sup> Not *ho athlon* which is "the contest" for a prize.

outcome distributes benefits and costs among players and reveals to the reader each player's perceived outcome as a victory or defeat.<sup>195</sup>

## Rationality

Any discussion about agents making decisions must discuss how the author engages with rationality.<sup>196</sup> In this case, Thucydides' treatment of rationality, or what Thucydides' agents considered to be rational, logical or sensible decisions was what led to "good" decision-making. The irrational, or "bad" decision-making, will be the topic of the final chapter in the thesis. There is a major theme in Thucydides wherein the psychological state of players dictates the type of interaction. An Athenian embassy at Sparta tries to explain away complaints through appeals to the drivers of human nature (1.76.2):

There is nothing remarkable or contrary to human behaviour (ἀπὸ τοῦ ἀνθρωπείου τρόπου) in what we have done, just because we accepted an empire when one was offered and then declined to let it go, overcome by these strongest of all motives – honour, fear and self-interest (ύπὸ τῶν μεγίστων νικηθέντες, τιμῆς καὶ δέους καὶ ὥφελίας).

Thucydides in his own way provides a rational explanation of control over natural forces. One of the central tenets of rational control is the *consistent* correction of the natural forces toward a point of balance. In order to constrain these forces, he realized that humans are materially interdependent, and by implication psychologically interdependent.<sup>197</sup>

<sup>195</sup> As a side note, other historians at times use *agonia* instead of *agon*. Xenophon employs *agonia* to signify the *agon* itself, because fear takes place during the engagement. (Cyr.2.3.15, see also Pl.Alc.2.145c, Rep.8547d, Poll.3.142) Herodotus employs the term *agonias* to signify types of *agon* (Hdt.2.91). *Agonia* is interestingly absent in Thucydides, and may indicate a conscious attempt to define it in his own way.

<sup>196</sup> Ober (2008) 9-11, 99-117; generally in Thucydides Huart (1968) on psychological vocabulary, esp. (1973) on *gnome* as reflection and as an action (e.g. assembly motion) and in Greek thought, Dodds (1951).

<sup>197</sup> Hussey (1985) 120-21 for a lucid discussion of Democritean hedonism as "material interdependence" and by implication "morally interdependent": such that "the healthy soul will be emotionally tied to others"; On the apparent contradiction on the success of emotional effects versus rational planning (which I couch as an intentional ambivalence) see Pouncey (1980) ix-x; Crane (1996) 247-258.

Pericles played the role of the thinking mind of the body social, the *demos*. He gave them courage, he checked their enthusiasm (2.65.1, 8). In his funeral oration, to correct the selfish tendencies of citizens to desire more for themselves, he urges the *demos* to “fall in love” (*eros*) with the state; to desire more for the state as if it were for their own household (*oikeios*).<sup>198</sup> After his death, this *eros* for the state, devolves into an *eros* for Sicily, the Athenians had fallen sick with *eros* (ώρμηντο ... ἔρως ἐνέπεσε, 6.24.3).<sup>199</sup> Pericles was not there to correct course again, to check their enthusiasm.

The Corinthians at the assembly at Sparta note that the *agon* of war does not conform to rules and devises its own solutions. Since prediction is impossible, individuals can only control themselves (1.122.1).

ἡκιστα γὰρ πόλεμος ἐπὶ ρήτοις<sup>200</sup> χωρεῖ, αὐτὸς δὲ ἀφ’ αὐτοῦ τὰ πολλὰ τεχνάται πρὸς τὸ παρατυχάνον: ἐν ὧ δὲ μὲν εὐοργήτως αὐτῷ προσομιλήσας βεβαιότερος, ο δ’ ὄργισθεις περὶ αὐτὸν οὐκ ἐλάσσω πταίει.

War does not proceed by set rules - far from it: but generally devises its own solutions according to the circumstances. So the safest course is to handle war in a dispassionate frame of mind [lit. emotions under control],<sup>201</sup> while a heated reaction more likely leads to grief.

The Corinthians argue that the only thing worse than ‘stupidity’, ‘weakness of resolve’ and ‘negligence’ (ἀξινεσίας ἡ μαλακίας ἡ ἀμελείας, 1.122.4) is to underestimate one’s enemy (καταφρόνησις), which is renamed ‘mindlessness’ (ἀφροσύνη). Stupid through lack of planning, a coward from

<sup>198</sup> Crane (1996) 140-146.

<sup>199</sup> Hussey (1985) 132, and also 2.48.2, 49.4 for ἐνπίπτω as standard in medicine. Rogkotis (2012) 62-65, for the repetition of the verb ὄρμάομαι and cognates as a step before arriving at ἔρως, i.e. motivation precedes desire.

<sup>200</sup> Cameron (2003) 114, ἐπὶ ρήτοις as “on set terms, on specified conditions, by definite rules”; For the other famous personification of war: “War is a violent teacher and reduces the character of men to the same level”, (ο δὲ πόλεμος... βίαιος διδάσκαλος καὶ πρὸς τὰ παρόντα τὰς ὄργας τῶν πολλῶν ὁμοιοῦ. 3.82.2-3) is concerned with “the morality and the regulation of passions, emotions, character (ὄργας)”, CT 1.482; human nature affects everyone in the same way: desire falls over all (6.24.3); operations are governed by impulse (2.11.4, δι’ ὄργῆς); where prestige, fear and self-interest are described as “not contrary to human nature” (1.76.2), Stahl (1966 [2003]) 119-120.

<sup>201</sup> HCT ad loc.

lack of commitment and negligence of apparently small matters leads to poor decision-making. But surprisingly, overestimation of one's own abilities and underestimation of the opponent's are worse than if one had not planned at all. These faults are caused by emotional imbalance. How to control the emotions is one of the themes that connects the Speech of the Corinthians to the Speech of Archidamos.

Thucydides' further develops the theme of control over the natural forces of human nature. Whereas Pericles' leadership functioned as the course corrector of the *demos*, the Spartan king Archidamos argues that each individual must exercise self-control, or rather, consistent behavior. Archidamos' speech is meant to identify the principles of consistent behavior, which modern theorists call *rationality*, as a prerequisite condition for interaction. Archidamos speaks to the Spartan assembly, regarding the decision on whether to go to war with Athens or not (1.84):<sup>202</sup>

As for that “slowness” and “hesitation” for which they criticise us – don’t be ashamed of that. More haste may in the end mean less speed if you set off unprepared (ἀπατάσκευοι). ... So what these traits really amount to is enlightened self-discipline (σωφροσύνη ἔμφρων). This is why we alone do not indulge in arrogance in times of success and why we wilt less than others do in adversity; when others cheer us on to desperate deeds against our better judgements (τραπά τὸ δοκοῦν) we are not carried away by the flattery of their praise; and again, if someone tries to provoke us with accusations we are not more likely to be goaded into compliance. Our sense of good order is what makes us both brave in war and wise in counsel (καὶ εὑβουλοὶ διὰ τὸ εὔκοσμον γιγνόμεθα) We are brave in war because self-respect is derived mainly from self-discipline (σωφροσύνης), as courage (εὔψυχία) is from the sense of shame. And we are wise in counsel because we are educated with too little learning to despise the law and with too harsh a discipline to disobey them (σωφρονέστερον); we do not attain the level of useless intelligence that enables one to demolish an enemy’s plan (παρασκευὰς λόγω) convincingly in a fine speech but when executed is

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<sup>202</sup> Tsebelis (1989) 4.

quite different in action (ἀνομοίως ἔργω); rather, we are taught to believe that our neighbour's approach to planning (τάς τε διανοίας τῶν πέλας παραπλησίους) is much like ours and that the course of chance events cannot be determined by a speech. Our own preparations are always practical ones, made on the assumption that we face opponents who have taken good advice we should not base our hopes on them in the expectation of mistakes on their part, but on our selves and the safety of our own precautions (ἀσφαλῶς προνοούμενων); nor should we suppose that there is much difference between one man and another, but the one to come out on top will be the one trained in the hardest school of necessity (ἀνθρωπον ἀνθρώπου).

Archidamos addresses a variety of conditions necessary for self-control to yield efficient decisions. It is particularly important to follow these in the *agon* of war where there are no rules (*retoi*). First, controlled decisions take time. Time is necessary to ensure one is prepared (*pareskeuasmenoī*) to take a decision. Secondly, he establishes the condition of balanced and ordered behavior, i.e. ordered preferences (*to eukosmon* = *eukosmia*), such that the decision-maker may be well-advised (*eubouloī*).<sup>203</sup> A reversal of one's preferences are against one's decision (*para to dokoun*). What will ensure that the decision maker holds well-ordered preferences is self-control (*sophrosune/ sophronesteron*) over an irrelevant alternative that may be induced (*epairein*) by emotional reactions.<sup>204</sup> The argument for consistency in good decision-making is a common characteristic of good voting.<sup>205</sup> Archidamos' speech is not unique. The Mytilenean debate

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<sup>203</sup> This is the modern equivalent of a *complete ordering of preferences*, such that if it is decided that one action is preferred to another, the preference relation cannot be reversed – the exclusion condition.

<sup>204</sup> This is the modern equivalent of *independence from irrelevant alternatives*. The interpretation of 'emotional reaction' has to be hedonic in order for the examples (e.g. to become irritated or vexed) to have any intuitive appeal. In the Greek, it is rather fitting that the term *ἡδονή* is employed by Archidamos in this sense, such that one may be induced by pleasure (ἐπαίρομεθα *ἡδονή*, 1.84.2). Sen (1987) 43, similarly argues that this aspect of **utility** is an enhancement of "individual well-being". Sen calls "agency" a person's "ability to form goals, commitments, etc.", which is independent of utility maximization, p.40. In Sen's example, happiness is a consequence of achieving an objective. Archidamos' argument is that freedom and honor are a consequence of achieving self-control, since self-control helps to achieve a goal. By noting that utility is irregular, self-control acts as a constraint that ensures the highest utility for the collective, rather than for the individual.

<sup>205</sup> Harris (2007) for Athenian courts striving to achieve consistency.

reiterates many of these points, however now from an Athenian perspective.

<sup>206</sup> Cleon's main argument is that "bad laws that are never changed (*nomoi akinetoi*) are better for a city than good ones that have no authority." (3.37.3). Consistency is a fundamental requirement.

There are other instances as well. The Athenians who speak at Sparta note that the Athenians contributed to the Persian defeat because they were united in their cause (κοινόν) and did not disperse and thence were not useless to their allies (μηδὲ σκεδασθέντες ἀχρεῖοι αὐτοῖς γενέσθαι, 1.74.2). In democratic Athens consistent behavior is union of resolve,<sup>207</sup> whereas in oligarchic Sparta consistent behavior is self-control. Game theory describes a player who acts consistently as a player who holds *consistent preferences*. Calculation reflects action only when preferences are ordered and well-established.<sup>208</sup> Thucydides describes consistency as dependent upon the type of decision-maker. The Corinthians at Sparta describe the difference in character between Athens and Sparta, in terms of how they fall short of following a consistent plan (τῆς τε γνώμης... τοῖς βεβαίοις): the Athenians take risks contrary to planning (παρὰ γνώμην κινδυνευταί, 1.70.3), whereas the Spartans plan consistently but distrust it.<sup>209</sup>

For Archidamos, Pericles and Thucydides, the most important behavioural property of decision-making is *consistency*. Thucydides' narrative outlines,

<sup>206</sup> Diodotus in his speech on the Mytilenian debate similarly argues point by point why rational decision making requires self-control: "I believe the two things most opposed to good judgment (εύβουλία) are haste and anger (τάχος τε καὶ ὄργήν)" (3.42.1). Diodotus, like Archidmos, in general describes rational decision making as self-control (σωφρονα... εὖ βουλεύοντι, 3.42) over emotions (σωφρονέστερον ... νῦν δὲ πρὸς ὄργήν ... ξυνεξήμαρτον, 3.43).

<sup>207</sup> Funke (1980) on *homonoia*; Ober (2008) 99-102, in Athenian democracy "debate mattered" and thus "Questions about how to distribute public goods and burdens did periodically threaten to destabilize decision-making processes based on shared core preferences." (102)

<sup>208</sup> A rational actor model satisfies these conditions, so that preference relations are consistent. Preferences in Thucydides may be said to be imperfectly analogous to preferences which are *complete*, *transitive* and *independent from irrelevant alternatives*. The von Neumann-Morgenstern axioms are four: completeness, transitivity, independence and continuity

<sup>209</sup> Hussey (1985) 123ff. Hussey argues that both Pericles and Archidamos stress education and it approaches a Democritean ideal. He adds that "the symmetry of Sparta and Athens about a Democritean axis is striking, and calls for further investigation." It is evident that "Archidamos and Pericles are aware of the weaknesses of their respective cities."

albeit in a far less precise form, the basic conditions required for modern theories of rational choice. Still, Archidamos' makes a point distinct to all theories of rational behavior. Decisions are not 'instantly' rational, they take time. Decision-making is slow and calm (μὴ ταχύ, 1.83.1, καθ' ἡσυχίαν, 1.83.3, 1.85.1). Archidamos' definition of *rationality* is that players must be consistent and calm in their decisions.

### On common knowledge

For agents to think strategically, each agent must consider how the opponent thinks. Do agents in Thucydides think about what another agent thinks about? Archidamos argues that the Spartans must assume (*nomizein*) that their opponents (*oi enantioi*) have similar plans (*tas dianoias... paraplesious*) to theirs.<sup>210</sup> So that they, the Spartans, may be always prepared (*aiei... paraskeuazometha*) for action against a well-informed enemy (*hos pros eu bouleuomenous tous enantious en ergoi*). Archidamos completes this idea by emphasizing that "we must assume (*nomizein*) that there is no great difference between man and man (*anthropon anthropou*)."<sup>211</sup> Mental parity is a philosophical concept explored by various other thinkers at the time. The idea of non-uniqueness in one's ability to calculate is best defined in one of Democritus' medical explanations. He argues that any human body is generated from seeds dispersed throughout the body and its main parts<sup>212</sup> and concludes that "all men will be one, and one man all".<sup>213</sup> Anaxagoras makes a similar point, albeit referring specifically to the mind: "Mind is all-alike, both the greater and the smaller quantities of it". Anaxagoras extends Democritus' biological parity to intellectual parity.<sup>214</sup> He adds that the mind of man is a natural force

<sup>210</sup> In the sense that "there is no great deal of difference between the way we think and the way others think"; the term *tas dianoias*, is translated as intentions, thought, scheme.

<sup>211</sup> See Alcibiades 6.18.3 "change your habits to resemble the point of view of other". In this light if we combine both Archidamos' and Alcibiades' points, we can say that all men are mentally alike in ability, yet hold different perspectives. Of course, there are exceptions.

<sup>212</sup> DK 68A141.

<sup>213</sup> DK 68B124.

<sup>214</sup> Simplicius *Phys.*164,24. The main difference between Democritus and Anaxagoras is that non-uniqueness of the body is achieved through a complete mixture of elements, whereas the non-uniqueness of mind is because everything is a mixture except mind. Non-

that created the cycles and the opposites. In principle, all men share the same body and the same intellect.

Also in line with contemporary philosophical trends, agents in the *History* calculate in accordance with the assumption of *common knowledge*, which goes beyond cognitive parity. Both Archidamos and Pericles place primary emphasis on the *psychological interdependence* among states and among citizens.<sup>215</sup> The narrative description is very much in line with Archidamos' assumptions. Often there are similar calculations borne out in the speeches of opposing players. To note one example, Pericles' speech at Athens (1.140-144) "answers and echoes"<sup>216</sup> the Corinthians' speech at Sparta (1.120-124) on the strength of Athens and of her opponent.<sup>217</sup> Picking up from the Corinthians' prediction that the Peloponnesian alliance could defeat the Athenians "in a single victory" (*μιᾷ τε νίκῃ*, 1.121.4), Pericles replies that the superiority of the Peloponnesian alliance depends upon the collective behaviour of the allies, who must coordinate at this single point in time (1.141):

In a single battle the Peloponnesians and their allies are able to withstand the whole of Greece, but they are incapable of sustaining a war against the power so differently organised from theirs. They have no single executive council and cannot take prompt emergency action; and since they all have an equal vote and come from different nationalities, each of them presses their own case – a recipe for getting nothing done. What some of them want is the heaviest possible retaliation against a particular enemy, while others want the least possible damage

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uniqueness is a result of perfect heterogeneity of opposites ("in everything there is a portion of everything") and perfect homogeneity ("everything contains a portion of everything except mind"). Also see *The Sacred Disease* 16, on the particular importance of the brain (probably derived from Diogenes): "air spreads into the rest of the body after leaving behind its choicest part in the brain (*kataleloipos en toi enkefaloι*) and whatever of it is intelligent and possesses judgment (*gnome*); Aristophanes *Clouds* 227 "mingling my delicate intelligence with air of like kind" (*es ton homoioν aera*). This section is thought to be derived from Diogenes, but note that both Anaxagoras and Aristophanes refer to mind as delicate (*leptos*) and of like kind (*homoios*). Kirk and Raven (1983) 372ff, 430ff.

<sup>215</sup> Hussey (1985).

<sup>216</sup> CT 1.196ff. correspondences, e.g. 121.3 = 141.5, 142.4, 142.7, 143.1; 122.1 = 142.2 (*epiteichismos*); see esp. 1.141ff. introducing the "point by point" comparison of strengths.

<sup>217</sup> CT 1.226ff; generally Hagmaier (2008).

to their own property. On the rare occasions when they do get together, they spend only a small fraction of their time looking at matters of common concern, but devote most of it to their private interests, and **each of them thinks his own negligence** will do no harm, but that it is someone else's business to look after their future on their behalf. **The result is that because they each share the same misconception they fail to notice the ruin of their common cause.**

Pericles' says that all individuals should be aware that all individuals think they are not doing harm to the collective by thinking all in the same way.<sup>218</sup> Pericles argues that each individual should consider what others know, so that everyone knows that everyone knows what everyone knows.<sup>219</sup> Pericles and Archidamos possess a theory of mind, or rather, "an ability to understand the mental states of other people". The public announcements themselves reveal that now the larger masses on both sides do too, and no longer Pericles and Archidamos alone.<sup>220</sup> In abstract terms: For Archidamos, in the event there are only two players, both sides should assume I know what you know, I know that you know what I know, and you know that I know that you know what I know. It is interesting that Pericles points out, or reveals as it were, that everyone holds an idea in common, whereas Archidamos states that players should act as if they knew. Now that we have established, in outline form, how Thucydides conceived of rationality and theory of mind, we must discuss the rules to which Thucydides' narrative universe belongs. What outcomes do players have control over and which do they not? Game theoretic terminology can be very helpful here.

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<sup>218</sup> Ober (2009) 71f. for a discussion of the "commons tragedy" as a result of "free-riding" in ancient Greek public action, esp. 76-78.

<sup>219</sup> Again exemplified by the Spartan envoys on the matter of Pylos at 4.17.1-3, "Do not receive what we say in a hostile spirit, or imagine that we deem you ignorant and are instructing you, but regard us simply as putting you in mind of what you already know to be good policy.

<sup>220</sup> Chew (2001) 17, 78-79, for an anthropological review of common knowledge as a theoretical form of theory of mind and cognitive neuroscience; Aumann (1976) formal definition; Rubinstein (1989) practical formulation, on "almost common knowledge" he argues that to coordinate an attack, one player must send a message to another player to ensure participation. However, the sender's message has a risk of not being received: the sender needs to wait for confirmation, which he then must reconfirm, and so forth *ad infinitum*. Thus, the coordination of an attack never achieves common knowledge. Aumann and Brandenburger (1995) on mutual knowledge for two person games in normal form.

## Exogenous and Endogenous

In standard game theory, the elements of the game that are assumed to be **exogenous** are players, feasible actions, preferences and the temporal structure (static or dynamic).<sup>221</sup> Outcomes on the other hand are **endogenous**, because these are derived from the unique combination of the exogenous elements. If an exogenous variable should change, the endogenous variable would respond to the change. In contrast, if player numbers were to go up, then preferences would remain fixed, such that, they would be unaffected. An exogenous variable is not related to other variables in the game by causal links, but it is determined by factors outside the system. An endogenous variable is a state whose value is determined by the equilibrium of a game, in contrast to an exogenous variable that is imposed on a game from outside.

The elements used to describe a game are exogenous: this is unrealistic. All states of *being* come to be as an endogenous process, i.e. time period  $t$  is the result of time period  $t-1$ . This is a universally accepted temporal assumption of causation; cause precedes effect.<sup>222</sup> Events of unknown cause are as a rule described as determined by nature or God, and thus **exogenous**. Many theorists try to endogenize different elements of the game: Brams endogenizes actions by setting all interaction as dynamic,<sup>223</sup> Hotelling endogenizes actions by making an action dependent on distance which is subject to an endogenous-sharing rule,<sup>224</sup> others endogenize preferences as dependent on limited foresight, habit, moral value, learning, imitation or even on degree of conformism.<sup>225</sup> These players are subject to bounded rationality, which studies a player's departure from strict rationality. Boundedly rational players may have more complex preferences or possess

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<sup>221</sup> These elements are also referred to as the primitives of the game. They represent the basic concepts which cannot be reduced to anything simpler. In mathematics, these would be a point, a line, a number, a dimension, a distance, ...

<sup>222</sup> Solon Fr. 9, for natural and human causal chains: clouds cause snow and hail, lightening causes thunder, like powerful men cause the destruction of a city.

<sup>223</sup> Brams (1994) 7, 10.

<sup>224</sup> Hotelling (1929), see Myerson (1991) 145-147.

<sup>225</sup> Kahneman, Slovic, Tversky (1982); Kahneman, Tversky (2000); Camerer (2003); Huck (2004); Elster (1984) *passim* esp. 77ff.; Gneezy and Rustichini (2000).

limited ability.<sup>226</sup> The number of players can also be endogenized. Player numbers may depend upon a selection process, upon self-selection or a random selection. The timing of when a player takes an action can also be endogenous, especially in sequential games. Research has shown that it is necessary for theorists to admit that circumstances are not always simply thrust upon players (exogenous initial conditions), but occur as a result of prior planning or arise from other forces 'known' to some or all the players (endogenous initial conditions). This is in fact closer to reality. Still, game theory has produced its greatest insights by abstracting from this realistic endogeneity, since there are too many unknowns in any specific encounter. The exogenous initial conditions gain realism as the description of the game increases in complexity.

Thucydides has a *kinetic* view of interaction. A player's move is literally a movement (4.55.4) or not. The dynamics of interaction are described as process or as forces (known to the narrator and one or more players). All forces are external, imposed from the outside, where players passively experience events of nature ἔκινήθη (2.8.3, earthquake),<sup>227</sup> and of human nature in conflict (ἔκινήθη 3.82.1).<sup>228</sup> As part of Diodotus' speech, Thucydides in the latter case is explicit (3.45.7):

ἀπλῶς τε ἀδύνατον καὶ πολλῆς εύηθείας, ὅστις  
οἴεται τῆς ἀνθρωπείας φύσεως ὄρμωμένης  
προθύμως τι πρᾶξαι ἀποτροπήν τινα ἔχειν ἢ  
νόμων ἴσχυί ἢ ἄλλω τῷ δεινῷ.

In short, when human nature is set on a determined course of action, it is impossible – and very naïve to think otherwise – to impose any restraint through force of law or any other deterrent.

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<sup>226</sup> Kreps (1990b); Fudenberg, Levine (1998); Rubinstein (1998).

<sup>227</sup> 7.50.4, the Athenian fleet delays its departure from Sicily on account of a lunar eclipse.

<sup>228</sup> Hdt. 1.71.3, for a similar use of the active and passive tenses: if you conquer them (νικήσεις) ... you will take (actively take), if you are conquered (νικηθῆσις)... you will lose (experience)

Players thus are subject to exogenous acts of nature and exogenous preferences. In this, Thucydides agrees with standard theory. He differs, however, in that, each player devises actions and rules independently.<sup>229</sup> Player numbers are exogenous since Thucydides the narrator is the one who decides who is responsible for devising the actions and rules. Sometimes players get the game 'right' and sometimes not. Uncertainty, i.e. chance (ἢ τύχη), features prominently, bridging calculation and observable outcomes. Thucydides the narrator is the modeler.<sup>230</sup> He describes thinking, action and outcome, and resorts to the use of turning points (ἢ κρίσις)<sup>231</sup> and changes of state (ἐμπίπτω, καθίστημι) to mark beginnings and endings of interaction.<sup>232</sup> Temporal and geographic markers help to identify action boundaries. Human nature compels (όρμη) players toward their goals, such that outcomes are endogenous. Thucydides' distribution of exogenous and endogenous elements is unique to his description of interaction.<sup>233</sup>

## From Narrative to Games

<sup>229</sup> Stahl ([1966] 2003) 75-101, on "Plan and Reality: Book 2". Thucydides describes interaction bi-dimensionally, as a player's version of the interaction in contrast to the actual interaction. This view of 'real' interaction is common. The mismatch between the 'modeling' and the 'real' is repeatedly discussed in the application of game theory to literature. Rapoport (1960) 238, in Shakespeare's *Othello*, "if [Othello] believes Desdemona, he may as well believe her version of the game ... and decide which game is in fact being played". Melhmann (2000) 77, in Goethe's *Faust*, Mephisto "realizes that his view of the game was false". In the event that players devise actions and rules independently and there is common knowledge, then it is called a strategic form game.

<sup>230</sup> Lowe (2000) 19ft.9, I follow Lowe's definition of narrator as an agent, which is part of the narrative and like a focalizer is a constructor of plot. The narrator is distinct from the author, who is in a top-level as text, author and reader.

<sup>231</sup> ἢ κρίσις - arbitration (1.34), especially in the case of the Athenians who are τὰς κρίσεις φιλοδικεῖν - "lovers of arbitration" (1.77.2), as it happens, an obvious lack of arbitration, also marks beginnings and endings. However, *krisis* appears to operate as an intertextual medical pun in the *History*.

<sup>232</sup> For beginnings see Bowie (1993); Dewald (2005), for endings see Stahl ([1966] 2003) 128.

<sup>233</sup> The terms exogenous and endogenous here are not to be confused with Thucydides' use of *endothern* and *exothern*. Note that Agis attempts to create stasis at Athens and is unable to move the Athenians from within (τὰ μὲν ἐνδοθέν οὐδ' ὄπωστοιν ἐκίνησαν, 8.71.2). This is similar to the way that the Athenians in an attempt to take Plataea are counting on agents inside the city to bring it over to them (2.79). "From within" is used of a population inside the city and "from without" as the population outside the city. These terms are locative and do not possess the force of *process*, as do the terms endogenous and exogenous: as the processes of elements created or given, respectively.

Simon Hornblower and Tim Rood and those who followed analyzed Thucydides through a narratological lens.<sup>234</sup> Rood firmly demonstrated the richness of a unitarian reading of Thucydides.<sup>235</sup> But the pioneer to combine narratology and game theory was the classicist Nick Lowe. He applied his findings to epic, but does not forget to take note of Thucydides and Herodotus. He meticulously demonstrated how narrative as *plot* exploits the “underlying cognitive apparatus” we use to relate to experiences in the real world, which in turn is stored as *successive states* linked as *cause and effect*.<sup>236</sup> Plot is the description of a causal chain with beginning, middle, and end.<sup>237</sup>

“PLOT The affective determination of a READER’S modelling of a story, through its encoding in the dynamic structure of a gamelike NARRATIVE UNIVERSE and the communication of that structure through the linear datastream of a TEXT.”

Game theory concomitantly helps to describe outcomes. From a structured interaction, characters combine each other’s feasible actions and thus are able to establish preferences over outcomes. In the case that the author leaves these elements implicit the description of a *game* remains “an analogic tool for uncovering the internal machinery of plot.”<sup>238</sup>

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<sup>234</sup> Hornblower (1994); CT 2.18-19; Rood (1998), (2004); Bakker (1997) 7-54; Wakker (1997) 215-250.

<sup>235</sup> HCT v., Appendix 2 “Strata of Composition” 384-444; Rood 16-17, esp. as in 119ft.39.

<sup>236</sup> Lowe (2000) 30-31, “Games share several properties with the universes of fiction. Both are closed, but in a configuration that is essentially dynamic rather than static: they cannot exist without development in time from one state to a different one. The contents and articulation of both can be formally described, though such a description is always complete in the case of a game and always approximate for a story world.” First, Lowe himself notes that historical narrative especially in the 5<sup>th</sup> century is compatible with the model of fiction: “the spell of narrative history is the spell of Homeric plotting itself: the epic fiction that events on a scale of nations and generations are perceptible as a unified causal whole.” p. 91. Next, I disagree with the last statement, in the case of Thucydides, the formal game is just as complete in the story world as it is in a description of a game.

<sup>237</sup> Lowe (2000) 266-267, esp. 12, Lowe based his framework on Aristotle’s definition of plot, *mythos*, *Poetics* 23.1459a19. For the *Glossary* definition at 266-267, he discloses the inherent cognitive framework involved in modelling, i.e. extracting a game, see *ad loc.* for the definitions of the capitalized terms; Cf. other methods on plot design and intention: Brooks (1984); on ‘discourse modes’ see Smith (2003) with Rademaker, Buijs (2011); on plot as complication, peak and resolution Van Dijk (1982) with Allan (2011).

<sup>238</sup> Lowe (2000) 32-33.

Lowe takes the basic principles of game theory: players, moves, and rules, and merges them with the narrative universe in all its complexity of space and time. Based on Lowe, here is the “how to guide” to extract a game from a narrative text.

## Clock, Board and Players

First, narrative has a **shape**, which means it operates within space and time, which we call a board and a narrative clock, respectively. Secondly, there exists a **population** of which some are player, who make moves. Thirdly, there exists a framework with external **rules**, otherwise understood as constraints, and ‘**endgame**’ conditions for closure of narrative time to exist.

The three categories: **shape**, **rules** and **population** are subdivided. The **shape**’s narrative clock records the passage of time in the primary narrative. The administration of narrative time is different from story and text time. Direct speech is text time, whereas chronology of the story universe is story time, obeying the story’s real world temporality.<sup>239</sup> The time it takes to read a speech is fairly equal to the time it takes to hear one, whereas the story’s progress in years and seasons are not in real time. It is important to locate episodes relative to one another in story time. The clock as story time identifies the beginning and the end, which contains subgames or episodes with their own clocks of beginnings and endings. As an example the Mytilenian debate, the Corcyrean *stasis* [factional struggle], and the Sicilian Expedition are all subgames of the Peloponnesian war. Lastly there is narrative time, which is the **game clock** that can start, stop, suspend, run backwards, or reset in the past or the future, in other words it contains ellipsis (analepsis or prolepsis), summary, stretch, scene, pause,<sup>240</sup> accelerando and so on.<sup>241</sup> The second characteristic of shape is the **board**. It imposes spatial boundaries or informational boundaries, which limit the players’ “spheres of power”, or rather dictates their relationships. The board also adds uniqueness with sight, sound, smell and sensation.<sup>242</sup>

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<sup>239</sup> Rimmon-Kennan (1983) makes the distinction between ‘story-time’ and ‘text-time’, Genette ([1972] 1980), ([1983] 1988) between ‘narrated time’ (temps de l’histoire) and ‘narrating time’ (temps du récit) recognizing the distinction in the German language between ‘Erzaehlte Zeit’ (the time of the narrated event) and ‘Erzaehlzeit’ (the story-teller’s reconstructed chronology).

<sup>240</sup> Bal (1985) 71-7, (1997) 102-11, Lowe (2000) 40.

<sup>241</sup> Lowe (2000) 36-41.

<sup>242</sup> Lowe (2000) 41-45.

Then there is the **population** of a narrative of which not all inhabitants are players: A player is an agent with a “participant role in the endgame”.<sup>243</sup> Therefore, a player must be able to make a move, which is defined as “*a change in the game state produced by a finite and legal manoeuver* on the part of a single player”.<sup>244</sup> Further still, not all actions in the story qualify as moves. Player moves are determined by the ability to act and point of view. A player’s actions are determined by motive, knowledge, and the power to act.<sup>245</sup> Of course if nature is a player, the move is exogenous, defined as beyond human control. A human player can make only an endogenous move, defined as an action that is **determined** by the interdependence of one player with another (or other multiple) players.<sup>246</sup> Players are characters that have a point of view in the narrative, as a result of internal focalization or the narrator’s external focalization. The difference is that one is the viewpoint of the character and the other is that of “quasi-objective reporting”.<sup>247</sup> A player is a focalizer, in other words, “a person (either narrator or character) through whose eyes the events and persons of a narrative are ‘seen’ ” or perceived.<sup>248</sup>

### Rules and Endgame

The structure that supports the clock, board and players are the rules and endgame. The rules are simple. They follow the “logic of causality” of the genre of literature. Fiction may follow a paranormal causality where

<sup>243</sup> Lowe (2000) 46, a “single player” can be a multiplicity of agents, such as an army, and not necessarily only one agent.

<sup>244</sup> Lowe (2000) 51.

<sup>245</sup> Lowe (2000) 48 ft. 18, Lowe renames Greimas’ *vouloir* as “motive” contaminated with the idea of ‘goal’” as power.

<sup>246</sup> More precisely, a player’s move is an ‘optimal’ move in a game that describes the outcome. An outcome is either a position of balance among players or a situation in which no agent in the game has the incentive to modify their chosen strategy. Outcomes are endogenous to the game such that a player moves in accordance with the initial exogenous conditions set out by the game. There is a debate on whether it is possible to endogenize actions completely, as Brams argues in his *Theory of Moves*.

<sup>247</sup> Lowe (2000) 47.

<sup>248</sup> de Jong (2001) xiv, point of view can be embedded in other points of view, but it can also describe the role of the actant. There are three pairs of ‘actants’: subject/object, helper/opponent, and sender/receiver. The actantial model was developed by the semiotician Algirdas Greimas in 1966. Greimas model may be considered a rough analogue to the classic game theoretic categories of player/payoff maximization, cooperators/ opponents, signalers/ receivers, see Lowe (2000) 47.

characters have supernatural powers. Non-fiction follows a realistic physical world, that obeys the rules of gravity, for example. The endgame then closes the game by pitting the players moves, or final moves if there is sequential interaction. At this point the reader is given an output, a steady state, a decision, in many cases the narrative merely changes subject matter. Below is a review of the basic framework (See Figure A). The approach to games follows this setup throughout.

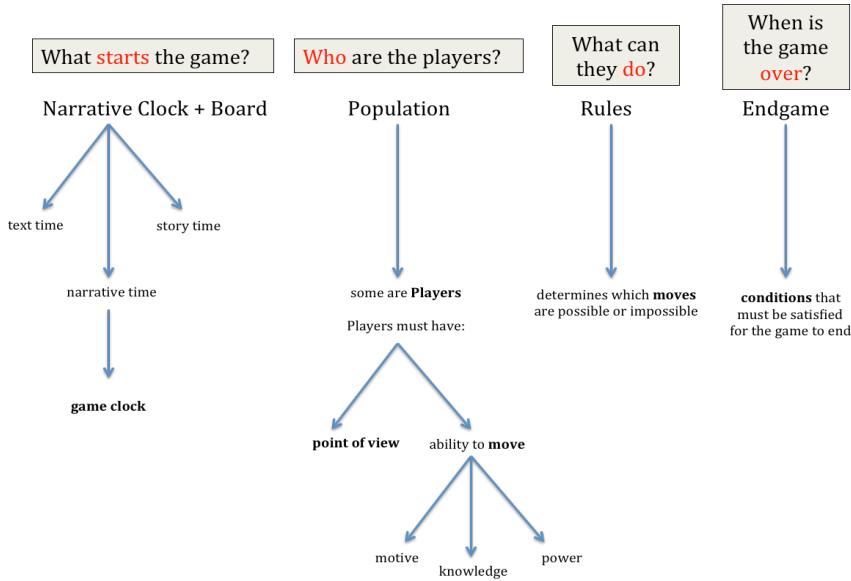


Figure A

This framework will help us to extract the description of an interaction, the implicit or explicit causal argument embedded in the narrative text. Whether Thucydides describes “solutions” in a game theoretic sense, where players act optimally, in these interactions is an entirely different debate. His notion of “solution”, albeit a peculiar incarnation, is not incompatible with the use of *equilibria* as starting points. Thucydides’ conception of equilibrium is based on the intersection of a unique form of “optimal” choices that allows him to describe the ephemeral nature of states.<sup>249</sup> This is to say that the

<sup>249</sup> Philosophically akin to Grandmont’s (1977) “temporary equilibrium”.

equilibrium outcome in one game may determine the off equilibrium play in another larger game. It is a game within a game. Micro and macro levels of interaction intersect to reveal the inefficiencies in play. In this way, the basic tools of game theory can be adapted to fit the author, especially since this analysis is not mathematical. With regard to Thucydidean scholarship, I follow views that are backed with strong academic consensus, and then use the tools of game theory to propose solutions for the points of least consensus.

## Chapter 1 – Strategic Games – Normal Form

### The *History* as a game

The scholarship on Thucydides' starting point for the war is fraught with debate. Thucydides himself gives competing 'beginnings'.<sup>250</sup> Dionysus of Halicarnassus, his most renowned critic, disagrees outright with his choice of beginning and end point (*Pomp.3*).<sup>251</sup> What this millennial and current debate shows is that Thucydides consciously chose and argued with himself about his choices of his beginnings and his endings.<sup>252</sup> Despite Thucydides' difficulty in settling on an event that led to the declaration of war, he employs a rule of thumb that appears ubiquitously before any unit of action. Prior to entertaining the question of whether the war was inevitable or the result of free will – the age-old debate over a deterministic or philosophical/metaphysical description of historical causation – one must admit that "to say that the war became inevitable once the Spartan army crossed the frontier is obvious and trivial".<sup>253</sup> We begin with the most trivial and gradually grow in complexity, such 'trivial' beginnings are programmatic. A brief investigation into simple beginnings will help us to elucidate Thucydides' views.

Thucydides writes (1.23.4):

**ἡρξαντο** δὲ αὐτοῦ Αθηναῖοι καὶ Πελοποννήσιοι  
λύσαντες τὰς τριακοντούτεις σπονδὰς αἱ αὐτοῖς  
ἐγένοντο μετὰ Εύβοιας ἄλωσιν.

The war **began** when the Athenians and the  
Peloponnesians annulled the thirty-year treaty

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<sup>250</sup> 1.146, Elis (1991) 349.

<sup>251</sup> Dionysius of Halicarnassus disagrees with Thucydides, who begins with the events at Corcyra, instead of with Athens' achievements immediately after the Persian War; Thucydides' *telos* is in 404 BC, whereas Dionysius wants it to end in 401. Works that discuss Thucydides' bold and vivid style: *On Thucydides*, *To Ammaeus* (summary of the former) cf. 11, *To Pompeius* 3-5, *On Literary Composition* 22, *On Demosthenes* 1, 9-10.

<sup>252</sup> Discussion on this point is postponed until Chapter 3.

<sup>253</sup> Kagan (1969) 4; similarly Stahl (1966) 75 "the die is once and for all cast when he crosses the Attic border".

concluded between them after the capture of Euboia.

In this passage, the capture of Euboia constitutes an approximate beginning for The Thirty Years Peace concluded in 446 BC.<sup>254</sup> The treaty was actually concluded “shortly after” the “whole island was subdued” (κατεστρέψαντο πᾶσαν... οὐ πολλῷ ὕστερον 1.114.3-115). The description of a beginning can be imprecise and refer only to the action. Still, just as cause and effect, a decision precedes an action as a result of the recurrent *speech anticipates narrative*. The end of the Thirty Years Truce constitutes the beginning of the war. In the next examples, the Spartan resolution declaring the dissolution of the treaty identifies the beginning (cases *a* through *d*).

a. 1.79.2:

καὶ τῶν μὲν πλεόνων ἐπὶ τὸ αὐτὸ αἱ γνῶμαι ἔφερον,...  
καὶ πολεμητέα εἶναι ἐν τάχει.

“the opinions of the majority tended to the same conclusion ... that they must go to war without delay”

b. 1.87-88:

The ephor put the vote (ἔπεψήφιζεν) to the assembly of the Spartans. ... by a clear demonstration of their judgment (αὐτοὺς φανερῶς ἀποδεικνυμένους **τὴν γνώμην**) he wished to make them more eager for war. ... Then they stood up and divided, and those who thought (οἵς ἐδόκουν) the treaty had been broken were found to be in a large majority (πολλῷ πλείους). ... The decision (ἡ διαγνώμη) of the assembly that the treaty had been broken, was made in the 14<sup>th</sup> year from the beginning of the thirty years' truce, which was made after the Euboean war (ἔγένετο ἐν τῷ τετάρτῳ καὶ δεκάτῳ ἔτει τῶν τριακοντοτίδων σπονδῶν προκεχωρηκιῶν, οἱ ἐγένοντο μετὰ τὰ Εύβοικά).<sup>255</sup>

c. 1.88:

ἔψηφίσαντο δὲ οἱ Λακεδαιμόνιοι τὰς σπονδὰς λελύσθαι καὶ πολεμητέα εἶναι οὐ τοσοῦτον τῶν

<sup>254</sup> OPW 293-4, Appendix 1 on “The terms of the Thirty Years Peace”.

<sup>255</sup> See 1.114.

ξυμμάχων πεισθέντες τοῖς λόγοις ὅσον φοβούμενοι τοὺς Αθηναίους μὴ ἐπὶ μείζον δυνηθῶσιν, ὀρῶντες αὐτοῖς τὰ πολλὰ τῆς Ἑλλάδος ὑποχείρια ἥδη ὄντα.

The Spartans voted that the treaty had been broken and to go to war, not so much by the influence of the speeches of their allies, as by fear of the Athenians, lest they become too powerful, seeing that the greater part of Hellas was already subject to them.

d. 1.118.3:

αύτοῖς μὲν οὖν τοῖς Λακεδαιμονίοις **διέγνωστο**  
λελύσθαι τε τὰς σπονδὰς

“The Spartans had already decided that the truce had been broken”

The Spartans decide that the truce is broken.<sup>256</sup> The opinions of the majority tended to the same conclusion; that they must go to war without delay. The vote itself “was a clear demonstration of their sentiment”, “the majority” voted for war. The game clock starts with a decision. Mirroring the elaborately described assembly at Sparta, there is a short description of the assembly at Athens (2.12). A proposal was passed in the assembly at Athens that the people of Athens (τὸ κοινόν)<sup>257</sup> were not to receive any Spartan envoy or embassy (Pericles proposed it, γνώμη).

After Archidamos finishes his address to the Spartan assembly he immediately sends an envoy Melesippus son of **Diacritus** to Athens (note the patronymic, indicating that his presence was noteworthy,<sup>258</sup> and perhaps more telling is the translation of the name which is “choice<sup>259</sup>”). When Melesippus arrived the Athenians not only did not receive him, but also ordered that he be outside their borders that very day (ἐκέλευον ἐκτὸς ὅρων εῖναι αὐθημερόν). The Athenians escort the Spartiate to the border who

Chris 24/3/16 22:05

Comment [1]: Would have to be 'chosen'.

<sup>256</sup> 7.18.2 for the Spartan belief that Athens broke the treaty and Thucydides' implied belief that it was actually the seizure of Plataea by the Thebans, and therefore the Spartans' fault.

<sup>257</sup> HCT ad loc. Gomme writes “the boule, perhaps, or rather the prytaneis, and the strategoi; but the ekklisia is not ruled out. ἐς τὴν πόλιν is here ‘within the city.’”

<sup>258</sup> See 1.139.3, he was also sent the year before to Athens with two other ambassadors, but there he was not given a patronymic.

<sup>259</sup> Name attested in Andoc.1.53. Diacritus' the literal translation is 'separated out' and the adjective in the sense 'choice, excellent' is first attested in Hellenistic poetry.

says as he reaches the frontier (ἐπὶ τοῖς ὄροις) that “This day will be the beginning of great disasters for the Greeks.” (ἡδε ἡ ἡμέρα τοῖς Ἑλλησι μεγάλων κακῶν ἄρξει. 2.12.3-4).<sup>260</sup> The *decision* to go to war is discussed from 1.23 to 2.12, which in story time precedes the action(s) that led to “the beginning of the war” (ἡ ἀρχή, 1.118.2).

Verbal repetition, which Rood calls a Thucydidean mannerism that explores historical ‘truth’ through a ‘fictive’ device,<sup>261</sup> indicates when the clock starts. The verbal adjective *polemeteon*, a common type of grammatical form in Thucydides,<sup>262</sup> is translated as “of war-time” or “to be warred on”<sup>263</sup> or better still, “of one in a state of war”. It is a rare term and is used only three times in the narrative. The term is used twice at the beginning of the war, before (1.79.2) and after (1.87.3) the vote at Sparta,<sup>264</sup> and only once at the beginning of the war in Sicily (6.50.1). There, a council of war is held between the generals Nicias, Lamachus and Alcibiades. Each makes a distinct proposal, but Lamachus breaks the three-way tie by casting his vote in favor of Alcibiades’ proposal.<sup>265</sup>

Λάμαχος μὲν ταῦτα εἰπὼν ὅμως προσέθετο καὶ αὐτὸς τῇ  
Ἀλκιβιάδου γνώμῃ.

<sup>260</sup> Melesippus’ words have Homeric and Herodotean counterparts (Il.5.63, 11.604; Hdt. 5.30.1, 97.3); CT 1.250, Hornblower argues that “Th.’s report of Melesippus’ words is authentic” given that Aristophanes alludes to this passage in the *Peace* 435-6, whose work was not available to Thuc. The authenticity of the passage for our purposes is not as crucial as the fact that Thucydides’ chooses to include this character and this event as one more among the others to emphasize that war, as it pertains to the realm of action, had begun.

<sup>261</sup> Rood 47.

<sup>262</sup> Stork (2008) 227, provides a complete list of the verbal adjectives ending in -τέος, -τέα, -τέον in Thucydides.

<sup>263</sup> Lyndsay transl. *ad loc.*; Hobbes 1.79 *ad loc.*, respectively; see Arist. *Lys.* 469.

<sup>264</sup> The use of διαγνώμῃ and its cognate διαγιγνώσκω at 1.87 and 1.118, respectively, gives the vote a medical flavor. The *diagnosis* was achieved through argumentative proof, or a “clear demonstration (ἀποδεικνύμενος) of their judgment (τὴν γνώμην)” (1.87, see Arist. *An.Post.* 0.75b22 – syllogisms and ὀπόδειξις, 75b1-37 generally, later used for mathematical proof). An especially rich comparison is at 3.53, where the Plataians point out in their speech that the Spartan’s decision has already been diagnosed (ἔτι διεγνωσμένην κρίσιν καθιστώμεθα.), which again savors strongly of a medical diagnosis of crisis (i.e. turning point of a disease). Generally for the association of voting with crisis, κρίνω with κρίσις, Chantraine 584, L&S *ad loc.*

<sup>265</sup> Unlike the game clock of the Peloponnesian war, there appear to be no medical association here, just a γνώμῃ.

These were the views expressed by Lamachus. However, he gave his support to the plan of Alcibiades.

Sailing into the Great Harbour of Syracuse, a herald makes a proclamation of the Athenian decision to go to war (6.50.5).

έπει δ' ἐκηρύχθη καὶ κατεσκέψαντο τίν τε πόλιν καὶ τοὺς λιμένας καὶ τὰ περὶ τὴν χώραν ἐξ ἣς αὐτοῖς ὄρμωμένοις **πολεμητέα ἦν**, ἀπέπλευσαν πάλιν ἐς Κατάνην.

When they had made the proclamation, they made a reconnaissance of the city and the harbours and the general lay of the land to see where they would make their base for carrying on the war, and so returned to Catana.

**Beginnings** are decisions (γνώμη) to act, they need not involve the action of combat itself (see 6.9). Both the envoy from Sparta and the herald from Athens declare in speech that the war is beginning on the 'border' of enemy territory. The herald announces a decision and the envoy is interpreting the Athenian action, which means that a beginning is itself a subjective element.

It seems that something is missing. How did both parties arrive at a decision? Or in game theoretic parlance, how do the players value their possible outcomes? Thucydides gives us a unique insight into the process of decision-making and evaluation of outcomes through the players' rhetoric. The logoi and erga model, or the "relation of words to deeds" as Colin Macleod writes,<sup>266</sup> presents the plot in a way that the end game condition is already present in the description of board and players.

#### **Dominance - The First Invasion of Attica (431BC)**

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<sup>266</sup> Macleod (1983) 70.

Calculation that is predictive is syllogistic and expressed through the use of enthymemes in speech.<sup>267</sup> Enthymemes are a form of syllogism. Take one example from Archidamos' exhortation before the first invasion of Attica that turns out to be a *focalization* of the Athenians' possible moves.

πᾶσι γὰρ ἐν τοῖς ὅμμασι καὶ ἐν τῷ παραυτίκα ὥρᾳ  
πάσχοντάς τι ἀηθες ὄργῃ προσπίπτει· καὶ οἱ λογισμῷ  
ἐλάχιστα χρώμενοι θυμῷ πλεῖστα ἐς ἔργον  
καθίστανται.

Everyone feels a rush of anger if they have to watch some unaccustomed damage inflicted on them right before their eyes; and when they are less able to reason the more the passion with which they rush to action.<sup>268</sup>

Simplifying into premises.<sup>269</sup>

Major Premise: All **who see damage** are **angry men**  
Absent Minor Premise: Some **who see damage** are **irrational men**  
Conclusion: Some **angry men** are **irrational men**

The major premise expresses the preference of the player – *motive*. Men are moved to anger by the sight of destruction. The minor premise expresses Archidamos' belief – the *knowledge* that as a consequence some men become irrational (absent). While the conclusion, expresses the *action* or choice of the player – to act irrationally. Those who are irrational, among those angry, take action.<sup>270</sup> Thucydides is using the concept of a set to determine the likelihood of a type of action (see Figure B).

<sup>267</sup> Arist. *Rhet.* 1.2.1356b, who speaks of the general use of enthymeme in proof through probability, but whose precise function and construction should be left aside.

<sup>268</sup> Marchant (1891) *ad loc.* identifies this sentence as an enthymeme.

<sup>269</sup> Premises are constructed from signs (semeia, tekmeria, eikota) and beliefs (doxa); Reynolds (2009) says deductive inference is "sign-based knowledge" because "signs are likely in force and descriptive in scope".

<sup>270</sup> For other important unitarian discussions of this episode see Rood 119-120, Pelling (1991) 125-8, Wilamowitz (1962) 132-77, de Romilly (1962) 287-99.

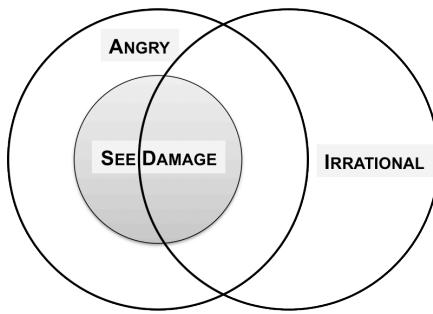


Figure B

The structure of a syllogism lends itself to abstract numerical manipulation by grouping elements, otherwise called a set.<sup>271</sup> The basic operations on sets are unions and intersections, expressed by the cognates of ALL and SOME, respectively. There is a set of those men who see damage. The set of those who see damage is a subset of the set of angry men. Men may become angry for other reasons: All A are B, but not all B are necessarily A. From the set of men who see damage and are angry, some act irrationally. This is an intersection of sets.<sup>272</sup> However, rational and irrational behavior are mutually exclusive, as *logos* is the opposite of *alogos*<sup>273</sup> (see Figure C).

<sup>271</sup> The set theoretical approach does not require exact number, in this case how many Athenians were angry and how many were not. Thucydides writes that the Acharnians were the largest deme (2.19.2), out of 140 demes of Athens. He supplies the number of Acharnian hoplites as 3000 (2.20.4), a number which has been contested as realistically too large and is the result of a copyist's mistake. "It did not suit Thucydides' context to be exact or provide details.", see Dow (1961) 67ft.2. also reviewing the literature on the Acharnian *hoplitai*. If Thucydides is referring to citizens rather than hoplites, exact population numbers in general in the *History*, or in any 5<sup>th</sup> c. historian, are unreliable, since the first regular census was taken by Demetrius of Phalerum in 317/6 BC and probably did not account for women and children, excluding *metics*. Thucydides' use of numbers in measurement (CT 2.17 ad loc., CT 3 Appendix 2; Rubincam (2001) on distance in stades) or in population numbers (Rubincam (1991) on casualty figures) has been shown to be either manipulated or incorrect. At 7.87.4, Thucydides programmatic *akribēia* does not necessarily include numbers: "the whole number was hard to give with precision (*akribēia*)". But not all numbers are unreliable, those which he would have had knowledge of, e.g. the number of ships sailing to Mytilene 42, and elsewhere 40 a slip of approximation. Numbers therefore are included as historical fact or used for effect and emphasis, and are not programmatic in themselves for the assessment of an outcome. Thucydides' programmatic mathematics is not arithmetic or geometric, but mathematical proof (see Chemla (2012) 1-68).

<sup>272</sup> The premises are simplified into a syllogism: All A are B, Some A are C, therefore Some B are C. Students of mathematics are often asked to prove this definition: For all sets A, B and C, if A ⊆ B, then A ∩ C ⊆ B ∩ C.

<sup>273</sup> For a similar discussion of the mapping of the Aristotelian practical syllogism to game theoretic concepts of rationality and consistency, see Charron (2000) 3-7.

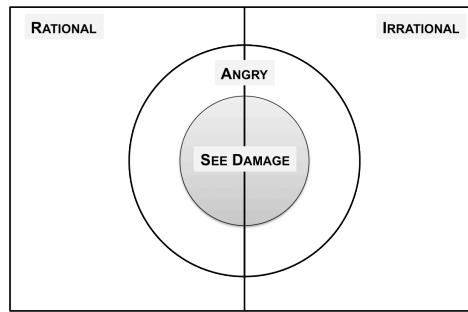


Figure C

Archidamos adds that this division of angry rational men and angry irrational men is likely (εἰκός) to occur to the Athenians (2.11.8).

Αθηναίους δὲ καὶ πλέον τι τῶν ἄλλων εἰκός τοῦτο δρᾶσαι, οἱ ἄρχειν τε τῶν ἄλλων ἀξιοῦσι καὶ ἐπιόντες τὴν τῶν πέλας δηοῦν μᾶλλον ἢ τὴν αὐτῶν ὄραν.

The Athenians are more than any other likely to do this, they claim the right to rule over others and are accustomed to ravage their neighbors' land, rather than see this done to their own land.<sup>274</sup>

This prediction is confirmed by the Athenians' reaction to the Spartan invasion.<sup>275</sup> Thucydides reports (2.21.2):

ἐπειδὴ δὲ περὶ Αχαρνὰς εἶδον τὸν στρατὸν ἐξήκοντα σταδίους τῆς πόλεως ἀπέχοντα, οὐκέτι ἀνασχετὸν ἐποιοῦντο, ἀλλ' αὐτοῖς, ὡς εἰκός, γῆς τεμνομένης ἐν τῷ ἐμφανεῖ, ὁ οὕτω ἐοράκεσαν οἱ γε νεώτεροι, οὐδ' οἱ πρεσβύτεροι πλὴν τὰ Μηδικά, δεινὸν ἐφαίνετο καὶ ἔδοκει τοῖς τε ἄλλοις καὶ μάλιστα τῇ νεότητι ἐπεξιέναι καὶ μὴ περιορᾶν.

When they saw the army at Acharnae, at a distance of sixty stades from Athens, they were no longer able to be patient. The land was being ravaged before their

<sup>274</sup> transl. P. J. Rhodes "This is **likely** to happen to the Athenians **even more** than with others, since they claim to rule over other people and are accustomed to invade their neighbours' land and ravage that rather than **see** this done to their own land.", see Smyth 1068 for *pleon* (*ti*).

<sup>275</sup> 2.18-23, see Hunter (1973) 20, "Expectation and result reinforce each other."

eyes – a thing which the young men had never seen before and the old only in the Persian Wars – it appeared terrible, as was natural; by all, and especially by the youth, it seemed best to go out and not disregard it (lit. overlook it).<sup>276</sup>

Manuela Dal Borgo 30/6/16 14:19

Deleted: it seemed best to the rest

Manuela Dal Borgo 30/6/16 14:19

Deleted: to

Manuela Dal Borgo 30/6/16 14:21

Deleted: young

Chris 24/3/16 22:03

Comment [2]: The Greek remains odd. The construction is 'allo te kai', which you'll find in LSJ. Hobbs rightly translates 'by all, especially by the youth'.

The destruction before their eyes (έν τοῖς ὅμμασι) is the trigger Archidamos counted on. The episode of the first invasion of Attica (2.18-24) will help us examine the game devised by Archidamos. The game clock starts when Thucydides specifies 1. the season of the year, 2. the height of the crops 3. and situates it as "about eighty days after the events at Plataea, Attica was invaded" (2.19.1). This is the temporal boundary. The length of time troop provisions last for the invading army is the endgame condition, in this case (2.23.3). The entry into Attica (19.1) and exit from Attica (23.3) are the geographic boundaries. The Spartans invade Attica (έσέβαλον ἐς τὴν Ἀττικήν) and exit Attica (not) by the way they invaded (οὐχ ἤπερ ἔσέβαλον).<sup>277</sup> Note the coincidence of both temporal and geographic boundaries at 19.1 and 23.3.

### Players, Actions and Preferences

Who are the **players**? At the start, together with the temporal and geographic boundary are the Athenians and Archidamos (2.19.1).

οἱ τε Ἀθηναῖοι οὐδὲν ἐπεκηρυκεύοντο... ἡγεῖτο δὲ Ἀρχιδαμος

"the Athenians did not send a herald" and "Archidamos led" the invasion

Archidamos represents the Spartans as a whole, whereas the collective Athenians are represented as a single player. Archidamos, son of

<sup>276</sup> οἱ ἄλλοι refers to "all [the rest including the young]", cf. Hobbes ad loc. translation. Adapted translation from Rood 140, who correctly notes that this passage is a further hint "of the impracticality of the Periklean strategy" to "keep quiet (ἡσυχάζοντας, 2.65.7), de Romilly (1956) 61, calls it a "plan de resistance passive".

<sup>277</sup> Thucydides' obvious programmatic statement forms a sort of chiastic construction to frame the game.

Zeuxidamos leads (ἡγεῖτο, 2.19)<sup>278</sup> and plans (γνώμη, διανοία, 2.20). The Athenians here are still in the process of producing a decision through debate (στάσιν δ' ἐνέσεσθαι τῇ γνώμῃ) whereas they were expected to send a herald to make a proclamation (έκηρύχθη, 6.50). Archidamos indeed waited for it.

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<sup>278</sup> Compare 5.83.1-2 “the Spartans” are “led (ἡγεῖτο)” by Agis, son of Archidamos, the game is compact with beginning, middle and end. Spartan expectations and outcome.

## Actions

The **board** is the constrained geographic location where interaction takes place. It is the north-western corner of Attica, bound specifically from Acharnian territory to the plains leading to the Long walls of Athens.<sup>279</sup>



Figure D: Athens – The city and its surroundings

The board restricts Archidamos' actions ravaging Acharnae or to entering the plain near Athens.<sup>280</sup> The Athenians who are in charge of the defence of the city and her territory have two possible actions. They may choose to go out or remain behind the walls, i.e. to fight or not to fight.

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<sup>279</sup> 2.18, see Rhodes (1988) ad loc.

<sup>280</sup> Because of where the game clock starts, the previous sentence describing the invasion through and attack on the garrison at Oinoe seems to be actions excluded from the game, 2.19. Even though his “reputation was most affected by his halt at Oenoe” (2.18) this side effect is irrelevant to the goal of Archidamos’ strategy of indifference. See Diod. 14.32.6, for the army of thirty tyrants encampment here in 404-403 BC, and *The Princeton Encyclopedia of Classical sites* on the exact location of the *deme* Acharnae - South of Mt. Parnes near modern day Menidi and Epano Liosia.

## Preferences

### Athenian Preferences

Let us start with Athenian preferences. The syllogism shows that Archidamos predicts that ravaging in plain sight will divide the Athenian camp, albeit he does not specify the precise proportions. It is implied, however, that the Athenians in fact divide into 'equal' halves; **collectively indifferent** to either fighting or not fighting (2.21.3).

**κατὰ ξυστάσεις** τε γιγνόμενοι ἐν πολλῇ ἔριδι ἥσαν, **οἱ μὲν** κελεύοντες ἐπεξιέναι, **οἱ δέ** τινες οὐκ ἔωντες.

The Athenians **took sides** and argued violently, **some** insisting that they ought to go out and **others** insisting that they ought not.<sup>281</sup>

As predicted (ώς εἰκός, 21.2), of the soldiers on site, **part of them** argued that they should not continue to look on and urged to go out, while **the other part** opposed them.

### Archidamos' Preferences

Archidamos' description of preferences are embraced by two nouns, *gnome* and *dianoia* (2.20.1 and 20.5) which describe the "thoughts in the mind of Archidamos or what his thoughts would have had to be *in order to make this move a purposeful one in view of the results*".<sup>282</sup> Thucydides' focalization of Archidamos' thinking at Acharnae reinforces the division of opinion on account of the large Acharnian contingent, and further, that if the Athenians should not come out to fight he would create division once again by ravaging the plains near the Long Walls.<sup>283</sup> Archidamos ravages their property in full view (ἐν τῷ ἐμφανεῖ, 21.2) expecting them to come out

<sup>281</sup> tr. Rhodes (1988) ad loc.

<sup>282</sup> Hunter (1973) 16-17, her italics, generally 11-21.

<sup>283</sup> Given Pericles' grip on Athenian decision-making, Archidamos is forced to enter the plains 2.23.

against him (ἥλπιζεν... ἐπεξελθεῖν, 20.2) and if they did not he would sally down to the Long Walls (2.20.4).<sup>284</sup>

εἴ τε καὶ μὴ ἐπεξέλθοιεν ἐκείνη τῇ ἐσβολῇ οἱ Ἀθηναῖοι, ἀδεέστερον ἥδη ἐς τὸ ὑστερὸν τό τε πεδίον τεμεῖν καὶ πρὸς αὐτὴν τὴν πόλιν χωρήσεσθαι.

if the Athenians did not come out to meet him during this invasion, he could henceforward ravage the plain with more confidence, and march right up to the walls of the city.

In this way, at a later time, he could divide them as well.<sup>285</sup> Thucydides tells us that Archidamos predicts that again there would be division in the Athenian assembly (στάσιν δ' ἐνέσεσθαι τῇ γνώμῃ. 2.20.4). Whether the Athenians fight or not is indifferent to Archidamos, for he creates division in the Athenian camp in both cases (*stasis*, 2.2.4 and 2.21.3). Thucydides ends his description calling it a *dianoia* – or a “complete overall strategy or tactic”.<sup>286</sup> (2.20.5):

τοιαύτη μὲν διανοίᾳ ὁ Ἀρχίδαμος περὶ τὰς Ἀχαρνὰς ἔν.

Those were Archidamos' motives for remaining in Acharnae.

<sup>284</sup> 2.11.6, at which point he does.

<sup>285</sup> It is necessary to explain the dynamics of Archidamos' planning. Note that both tactics are equivalent for the initial invasion, and the extension to it once there. The strategic environment he suggests is clear in both cases. Archidamos planning on site is fluid. Archidamos in fact has two considerations in the on going invasion: The numerous youths in the Athenian army and the numerous Acharnian contingent. Having invaded Attica, the terrain advantage is to the Spartans, who together with their allies, form a large army accustomed to land warfare. Archidamos is trying to induce them to come out. Take note of the verb ἐπεξέρχομαι, three times, once of the youths, once of the Acharnians, and then once again of the Athenians as a whole at 2.20. He at first is counting on the possibility that the youths may sway the Athenian assembly to come out and meet them at Eleusis or Thria. First, counting that the youths will create division, on account of their eagerness for war (2.8.1). (We are not told about the division explicitly, however it is implied.) Since they did not, he advances toward Acharnia. There we are told division sets in because of the Acharnians and especially because of the youths. The army's movement allows Archidamos to slowly appear, starting from Oinoe to Eleusis, to the plain of Thria to Rhei, then moving up keeping Mount Aigaleus on the right (2.19.2, 21.1) in order to finally encamp in Acharnae. The visual element of his strategy is fundamental to his optimal move. He must come close enough into view; it is a slow steady march. It is here that we should note that standard game theory need make concessions for the dynamism of real life events. Although Archidamos describes a static strategy in his own words, players are not 'instantaneously' positioned in a static game. The troops need time to march into view. It is here where Brams *theory of moves* gains its force.

<sup>286</sup> Hunter (1973) 49.

Archidamos refuses to go through with a “full-scale old-fashioned ravaging invasion”, as Chris Pelling calls it.<sup>287</sup> That is, it was not important to take the Athenians’ property outside the walls. He had previously condemned a ravaging invasion as futile in the debate at Sparta. He argues that the Athenians could easily shift supply abroad and gain the advantage (1.81.6).<sup>288</sup>

μὴ γὰρ δὴ ἔκεινη γε τῇ ἐλπίδι ἐπαιρώμεθα ὡς ταχὺ παυσθήσεται ὁ πόλεμος, ἢν τὴν γῆν αὐτῶν τέμωμεν. δέδοικα δὲ μᾶλλον μὴ καὶ τοῖς παισὶν αὐτὸν ὑπολίπωμεν: οὕτως **εἰκός** Ἀθηναίους φρονήματι μήτε τῇ γῇ δουλεῦσαι μήτε ὥσπερ ἀπείρους καταπλαγῆναι τῷ πολέμῳ.

As for the hope that if we waste their country, the war will soon be at an end, let that never lift us up; for I fear we shall transmit it rather to our children. For it is **likely the Athenians have the mind not to be slaves to their earth**, nor as men without experience to be astonished at the war. (trans. T. Hobbes)

Archidamos prefers to preserve the land to ravaging it. His policy on Athenian territory is to preserve the land and hold it ransom: “their land is a hostage in our hands, a hostage more valuable the better cultivated” (1.82.4). Archidamos’ speech centres around an aggressive or passive policy of war, and he prefers a passive policy to an aggressive policy.

This explains the “delay” during the invasion. Archidamos is severely blamed for it (*αἰτίαν τε οὐκ ἐλαχίστην Ἀρχιδαμός*, 2.18.2-5). The Peloponnesian army accuses him of a weak resolve and loitering (*μαλακός ... ἢ σχολαιότης*). Thucydides in more neutral terms refers to Archidamos’ pace as lingering (*ἐνδιατρίβειν*) and employs a Homeric *hapax* for restrained

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<sup>287</sup> Pelling (1991) 126.

<sup>288</sup> Pelling (1991) 125-6, on *eikos* at 2.11.8 and here.

behavior (ἢ ἐπίσχεσις).<sup>289</sup> This attention to restraint and anger, harks back to Archidamos' point on consistency and self-control (σωφροσύνη, 1.84).

Archidamos' first speech to the assembly at Sparta makes very clear that destroying Athenian property brings no benefit and that delaying engagement in order to properly prepare for war is a better alternative.<sup>290</sup>

De Ste. Croix notes that Archidamos' dovish speech is opposed to the hawkish speech of the ephor Sthenelaides, who favored a more aggressive policy and carried the vote for war.<sup>291</sup> In the narrative, implicit historical evidence corroborates a dovish policy during the war.<sup>292</sup> In book 5, the Spartans are banned from competing in the Olympic games in 420BC. Thucydides writes “the Spartans made no move”, literally ‘stayed quiet’, ἡσύχασαν” (5.50). Simon Hornblower comments here that “despite the absence of explicit negative, this is what narratologists call ‘presentation by

<sup>289</sup> Also a *hapax* in Thucydides. Note the interesting parallelism of restraint and anger. Hom. *Odyssey* 17.450, “They give recklessly; for there is no restraint or scruple in giving freely of another's goods, since each man has plenty beside him”, οἱ δὲ διδοῦσι μαψιδίως, ἔπει οὐ τις ἐπίσχεις οὐδὲ ἐλεητὺς ἀλλοτριῶν χαρίσασθαι, ἔπει πάρα πολλὰ ἐκάστῳ. In sum, there is no restraint for giving away what is not yours. To which Odysseus replies, that Antinous will not give even what is not his. Antinous becomes angry, Αντίνοος δὲ ἔχολώσατο κηρόθι μᾶλλον.

<sup>290</sup> Pelling (1991) 123ff. Archidamos' speech as a rhetorical response to accusations of Spartan “ignorance (*amathia*), slowness (*bradutes*) and calm (*hesuchia*)”.

<sup>291</sup> De Ste. Croix (1972) 141ff., esp. 153-4, de Ste. Croix agrees that Thuc. portrays Archidamos' policy as passive. The Spartans throughout the war divide into 'hawks' and 'doves': those who push for war and those who lean toward dovish policies that would serve Sparta's interests best. The proponents of the hawkish faction were the ephor Sthenelaides (432 BC, 1.85.3-87.3), the new ephors (421 BC, “opposed to peace” 5.22-4, 36.1, 46.4), Agis II (in military operations 427/6-400 BC), and Lysander (407 BC). The doves dominated for the greater part of the war, King Archidamos (2.13.1, Plut.Per. 33.3 - *xenos* of Pericles, 1.82.1-3, 83.3, 85.2 - asks for 2-3 years to prepare for war), King Pleistoanax (422 BC, 5.16.1-2, 75.1 - campaign saw no action, 5.33 - only campaign commanded), Pleistoanax's son Pausanias (3.7.2), the *protoi* (424 BC - leading men, 4.108.6-7 - refuse reinforcements for Brasidas, 5.15.1 - because they want the captives of Pylos back, 4.132.2, 128.5, 132.1, 5.13.1 - they later send reinforcements when Macedon is lost). “I would only suggest that there seems to have been an uneasy balance between ‘doves’, among whom King Pleistoanax is likely to have been prominent, and ‘hawks’, who seem to have had no leader of great ability until the emergence of Lysander in 407.” “Xenophon attributes Pausanias policy in 403 to ‘jealousy of Lysander’. This motivation for the policy is completely different from the one promoted by Thucydides that the dovish policy would serve Sparta's interests best.” During the Peace of Nicias, the treaty is nominal as long as they remain quiet, οἱ ἡσύχαζόντων μὲν ὑμῶν ὄνδρατι σπονδαὶ ἔσονται. (6.10.2) The split of aggressive factions and passive factions within both camps is explicit in Nicias' speech on the Sicilian expedition.

<sup>292</sup> Hornblower (2004) 273-284, in a more similar vein, argues that the reason Sparta did not go to war with Elis on account of the Olympic ban in 420BC on behalf of Lichas when he was flogged (5.49-50.4.4) was because “there were tensions within the Spartan elite”. War broke out only later in 400BC (Xen. *Hell.*3.2.21-3).

negation', which is a focusing device, a way of drawing attention to what did not happen. It is an implied negative, saying in effect they did not, as people feared, or they did not, as you might expect, make a move."<sup>293</sup> In 431BC, the Spartan troops and their allies intended the invasion of Attica to be aggressive and destroy property, but instead Archidamos redirected the invasion as an action to weaken the resolve of the Athenians through a passive provocation of stasis.<sup>294</sup> What follows is game theoretic description of what Thucydides chose to represent, such that these conclusions are not a factual account of the Athenian feelings.

### Preferences and Payoffs

Let us represent this in more manageable terms: The Athenians and Archidamos each have two available actions; to pursue a Passive policy or an Aggressive policy. In a **Strategic Form Game**, actions are also strategies. A strategy assigns one action to every decision node.<sup>295</sup> Given this is a **Strategic Form Game, where players move simultaneously**, there is only one decision node; every action is a strategy.

Athenian preference relation and payoffs

The Athenians have two strategies. They can come out or remain behind the walls, Aggressive or Passive, respectively. They also have preferences over outcomes, which yield payoffs for each strategy given the strategy of Archidamos. The Athenians have the advantage<sup>296</sup> if Archidamos is Aggressive (full scale ravaging of Attica) and the Athenians are Passive, because the Athenians can shift supply abroad (1.81.2).<sup>297</sup> This unites Athenian resolve and has no effect on Athens' revenue, since depriving her

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<sup>293</sup> Hornblower (2004) 284, Allison (2013) 269, at 1.118.2 another instance where "*hesychazein* is thus an active decision".

<sup>294</sup> Archidamos argues that they should hold Attica hostage rather than destroy it.

<sup>295</sup> Williams (1954) 16, A strategy is a "plan so complete that it cannot be upset by enemy action or Nature; for everything that the enemy or Nature may choose to do, together with a set of possible actions for yourself, is just part of a description of a strategy."

<sup>296</sup> Or at least they can neutralize any potential benefit to Archidamos, such that they gain no positive advantage.

<sup>297</sup> Pelling (1991) 125, "they can always import what they need", is an important theme later on, as they contrast with Sicily who do not need to import anything.

of her allies is done with a fleet not with a land army (1.81). Let us assign a payoff (a) for Athenians **Passive** and Archidamos **Aggressive** strategies. The outcome (**Passive, Aggressive**) yields payoff (a) to the Athenians.<sup>298</sup> The Athenians, given Archidamos' Passive strategy, are collectively indifferent to fighting or not fighting. If Archidamos is **Passive**, then the Athenians are indifferent to taking an **Aggressive** or **Passive** action. Let us assign a payoff (b) for the outcomes (**Aggressive, Passive**) and (**Passive, Passive**). The worst outcome for the Athenians is if they allow the Spartans to ravage their property without turning to their allies and fighting for their land. If the Athenians are Aggressive, fighting against the Spartans on land is to Spartan advantage. Let us assign a payoff (c) for the outcome (**Aggressive, Aggressive**). This is the outcome the Athenians “**do** become slaves to their land” and Archidamos launches a full scale ravaging of Attica. Unharmed strength (a) is better than stasis (b). Stasis (b) is better than fighting at a disadvantage (c). The Athenian preference relation tells us that: The payoff (a) *is preferred* to the payoff (b). The payoff (b) *is preferred* to a payoff (c).

Athenian payoffs:  $a > b > c$

#### Archidamos' preference relation and payoffs

Archidamos prefers a Passive strategy to an Aggressive strategy in all cases, since destroying Athenian property is laborious for the Spartans and does no great harm to Athens. He says that if they “*lay it waste, we would visibly be more dishonored and poorer*”, (*τεμοῦμεν αὐτήν, ὥρᾶτε ὅπως μὴ αἴσχιον καὶ ἀπορώτερον*, 1.82.5). Archidamos' comparatives make clear that an invasion with a land army to ravage property, an Aggressive strategy, would be to the detriment of the Peloponnese.<sup>299</sup> Archidamos prefers a Passive strategy. Let us assign a payoff (d) for the outcomes

<sup>298</sup> Game theory denotes outcomes as a pair of strategies. The first term in the bracket is the action of the Athenians and the second term is the action of the Spartans. A payoff is the value of that outcome to a player.

<sup>299</sup> 1.81.6, 1.82.5.

(Aggressive, Passive) and (Passive, Passive). This means that if Archidamos is **Passive**, he is indifferent to the Athenian Aggressive or Passive strategies. Let us assign a payoff (e) for the outcomes (Aggressive, Aggressive) and (Passive, Aggressive). This means that if Archidamos is Aggressive, then he is indifferent to an Athenian Aggressive or Passive strategy. Creating stasis is better than to become poorer. Archidamos' preference relation tells us that: The payoff (d) *is preferred* to the payoff (e).

Archidamos' payoffs:  $d > e$

Combine strategies (Aggressive and Passive) and payoffs for both players in the following matrix. The Row player is the Athenians and the Column player is Archidamos.

**Athenian payoffs :**  $a > b > c$

Archidamos' payoffs:  $d > e$

## Normal form representation

		ARCHIDAMOS	
		PASSIVE	AGGRESSIVE
ATHENIANS	PASSIVE	( b, d )	( a, e )
	AGGRESSIVE	( b, d )	( c, e )

Table 1

The normal form game, or a strategic game represented by a matrix, allows us to visualize all the possible outcomes described by the **plot**. (See Table 1) The usefulness of this table will be made clear in what follows:

Put your finger over the Athenians' Aggressive strategy, i.e. the Row Aggressive. What remains is the Athenians' Passive strategy, and Archidamos' Passive action or Archidamos' Aggressive action. This means that if the Athenians act Passive, Archidamos can choose to get a payoff of (d) if he acts Passive, or a payoff of (e) if he acts Aggressive. This is how we compare what outcome is better for Archidamos if Athens is Passive - compare (d) to (e). According to our preference relation, (d) yields a higher payoff than (e) so put a star next to (d). Repeat this by placing your finger over Athens Passive strategy, again Archidamos' payoff (d) yields a higher payoff than (e). Put a star next to (d).

		ARCHIDAMOS	
		PASSIVE	AGGRESSIVE
ATHENIANS	PASSIVE	( b, d* )	( a, e )
	AGGRESSIVE	( b, d* )	( c, e )

Table 2

This is called a **dominant strategy** (See Table 2). Archidamos prefers to be Passive *no matter what* the Athenians do. Now let us do the same for the Athenians. Place your finger over Archidamos' Passive strategy. Compare (a) to (c). The Athenians Passive action yields a higher payoff (a) than the Athenians' Aggressive action, which yields a payoff of (c), therefore star (a). Place your finger over Archidamos' Aggressive strategy and compare the Athenians' Passive action that yields a payoff of (b) and the Athenians' Aggressive action that yields a payoff of (b), as well. Since they are the same, put a star next to both of them. (See Table 3)

		ARCHIDAMOS	
		PASSIVE	AGGRESSIVE
ATHENIANS	PASSIVE	( b*, d* )	( a*, e )
	AGGRESSIVE	( b*, d* )	( c, e )

Table 3

The Athenians' Passive strategy is a **weakly dominant strategy**, because they do *at least as well or better* by choosing a Passive strategy. This matrix abstractly represents a Passive strategy deployed by the Spartans throughout the war (3.1). Archidamos' dominant Passive strategy forced the Athenians to choose between two strategies, to which they were **collectively indifferent**. This caused division, and exposed the inefficiency of the democratic decision-making procedure.

During the events at Acharnae, Pericles who is portrayed as a strong leader "refused to call an assembly", confident in his strategy of non-engagement (Passive strategy). The reason was to prevent the Athenians from making a mistake (τοῦ μὴ ὄργῃ τι μᾶλλον ἡ γνώμη ξυνελθόντας ἔξαμαρτεῖν, 2.22.1). Pericles' leadership here determines the tie-breaker. Hermocrates, like Pericles, a man Thucydides admired,<sup>300</sup> performed the same service for Syracuse during Athens' first invasion of Syracuse. In Sicily, the Athenians employ a similar strategy against the city of Syracuse, whose army does not come out against them. (6.96-98) The Athenians position themselves immediately above Syracuse upon Epipolae, a place which is entirely visible from inside the city (ἐπιφανὲς πᾶν ἔσω... 6.96.2, cf. 96.1).<sup>301</sup> On the following day, the Athenians went down against the city, but the Syracusans did not come out against them (πρὸς τὴν πόλιν ... ὡς οὐκ ἐπεξῆσαν αὐτοῖς 6.97.5). The Athenians thereafter set up forts at Labdalon and Syke on Epipolae (6.97.5; καθεζόμενοι... 6.98.2); Archidamos likewise set up camp when he arrived at Acharnae (καθεζόμενοι..., 2.19.2). The Syracusans decide to no longer overlook it and fight (ἐπεξελθόντες μάχην διενοοῦντο ποιεῖσθαι καὶ μὴ περιορᾶν, 6.98.2-3). When they came out, the Syracusan generals saw their troops were scattered and forming with difficulty, so they led them back into the city, leaving behind part of the cavalry to pick off the Athenians (6.98.3-4). It was Hermocrates, who of all the Syracusan generals, especially wished no longer to risk full-scale battles against the Athenians, but instead devised a strategy that would require only part of the army (πανδημί ... οὐκέτι ... μέρος ἀντιπέμπειν αὐτοῖς τῆς στρατιᾶς, 6.99.2).

<sup>300</sup> CT 3. ad loc. 6.72.2, esp. 485 on "the parallels between Hermocrates and Pericles".

<sup>301</sup> 6.97.4, Athenians take Epipolae.

The Syracusans followed Hermocrates' less risky strategy, or comparatively more passive strategy. The Syracusans in 414/415 BC, it is important to note, had voted to give their generals executive authority (στρατηγοὶ αὐτοκράτορες),<sup>302</sup> whereas Pericles in 431 BC would have to persuade a majority of the citizens to vote in his favor. In the case of democratic Athens, as a result of the passive Spartan strategy, the Athenian assembly vote tie-breaker is later fully exploited by self-interested or weaker leaders; a feeling explicitly expressed by Thucydides at 2.65.

The utility of a game theoretic/ narratological analysis of historical narrative is that analysis is made more clear and simple. A game helps to produce initial conclusions for or against a particular scholarly argument or opinion on a particular piece of textual information. With this game in mind, contradicting statements about the player's motivation are exposed as other possible speculative explanations, possibly produced by others. Thucydides tells us that "Archidamos is said (ώς λέγεται) to have held back in the belief that the Athenians, while their lands were still unravaged, would yield, and that the thought of allowing them to be devastated would be too much for them (2.18)."<sup>303</sup> Thucydides' method of historical reconstruction consists of reading intentions back into a player's actions who engage in equilibrium analysis, specifically that of eliminating dominant strategies.<sup>304</sup> Historical facts also acquire dissonance when juxtaposed to Thucydides' programmatic description. Pericles' strategy of non-engagement was not as Passive (δι' ήσυχίαν, 2.22.1) as Thucydides might have us believe. Pericles

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<sup>302</sup> Cf. 6.72.5, there are 15 Syracusan generals but nothing is said of how decisions were taken amongst them.

<sup>303</sup> Hunter (1973) 15-16, "ώς λέγεται, rarely used by Thucydides, indicates a kind of variant version, perhaps not his own but someone else's viewpoint." However, she argues against a "tactic of delay" which is an aspect of this game that is explained below as an element of Spartan character as opposed to Athenian character. Here it functions as a character trait, whereas later in the *History* it is exploited as an actual strategy, see Westlake (1977) 352-3; (1969) 127-8 rightly notes the theme of slowness of other Spartan commanders (2.85.2, 5.7.2, 72.1, 8.29.2, 50.3), but with no clear reason sees the statement at 18 as Archidamos' unfulfilled expectations. CT 3.273.

<sup>304</sup> Hunter (1973) 18, the entire episode "is reasoning after fact". However she argues that it is not Thucydides' own reconstruction but a record of the opinion that was circulating at the time. In light of the clear matching with other episodes in the *History*, it is perhaps safer to assume that he either created Archidamos' motivations himself or picked the opinions that fit his strategy.

did send out cavalry to repel the enemy.<sup>305</sup> Thucydides' emphasis was on passivity and therefore does not enter into a deep discussion on the cavalry deployment, unlike elsewhere, e.g. Sicilian Expedition. Other similar plots emerge and these posses similarities and differences, whether in outcome or the game set up.

### **Agis, son of Archidamos (411BC)**

This type of interaction is repeated in book eight (8.71), albeit in summary. In 411 BC, the Spartans are in control of the fort of Deceleia in Attica. Agis, the son of Archidamos, led his army down to the Long Walls of Athens expecting the Athenians to be thrown into an uproar by the sight (*ἴδοι*) of his army. Again the main focalizer is the Spartan King, here Agis: he is said “to assume” (*ό δὲ νομίζων*). He descends into the plain up to the very walls of Athens (*κατέβη πρὸς αὐτὰ τὰ τείχη*, 8.71.1) Compare Archidamos' focalization. Archidamos thinks that even if the Athenians did not come out from behind the walls “in this invasion” (2.20.1 and 20.4) he would approach “the city itself” (*καταβῆναι... πρὸς αὐτὴν τὴν πόλιν*). What is Agis' motivation? Agis expects in all probability (*κατὰ τὸ εἰκός*) that by these means the city will not to be calm but in a state of commotion (*θόρυβος*) from within and without (like Archidamos' first invasion, which caused the evacuation of the countryside and internal stasis). Agis expects the Athenians to be in a state of stasis<sup>306</sup> or not passive (literally ‘not calm’, *οὐχ ἡσυχάζειν... οὐκ ἀν ἡσυχάζειν*). Thucydides, in an authorial counter-factual, confirms the Athenians' calm explicitly, writing that “no one, before it happened, would have believed” the good morale of the Athenians in the days after the fortification of Deceleia. (7.28.3)<sup>307</sup> So the Athenians deploy their cavalry to attack those near the city (*τὸ ἔγγυς προσελθεῖν*).<sup>308</sup> Compare

<sup>305</sup> Thucydides records Pericles' decision to remain passive, but also that the cavalry was deployed to protect the fields near the city (2.22).

<sup>306</sup> CT 3. ad loc. for an extensive discussion on the “intolerably repetitious” use of the term *hesuchia*, and the debate on whether it should be deleted or replaced with the verbal form of the noun *stasis*.

<sup>307</sup> Flory (1988) 45, almost unbelievably, calls this counter-factual a “mere rhetorical flourish” as opposed to a “true speculation”.

<sup>308</sup> The adverb *near* is used twice for emphasis at 7.71.2.

this to the first invasion of Attica, where the cavalry is deployed to fall upon those who come near the city (ἐγγυς τῆς πόλεως, 2.22.2).<sup>309</sup> This is not an aggressive move for the Athenians, since the reader is told there that they “always” (αἰεῖ, 2.22.2) did so and also later in the narrative that the cavalry was deployed “as was usual” (ῶσπερ εἰώθεσαν, 3.1.2).<sup>310</sup> The deployment of the cavalry was an action which did not interfere with Pericles’ Passive strategy. Over the course of the war, as a result of the repeated invasions, the sight of Agis’ army fails to **cause stasis within** Athens (τὰ μὲν ἐνδοθεν οὐδὲ ὄπωστιοῦν ἐκίνησαν). The Athenians stick to a minimum engagement strategy, on account of Pericles in the first invasion and as usual thereafter. That is, this strategy is specifically designed for first invasions. Archidamos, having already hinted at this in his speech, had qualified the Athenians’ reaction to the invasion for events that were “something unfamiliar” (τὶ ἄηθες, 2.11.7). The tactic seems foolish in view of bk 2, but much has changed in morale and leadership and Agis could reasonably feel optimistic.

### Lamachus’ Proposal (415 BC)

Again a variation of the first invasion strategic game is discussed as one of three possible invasion strategies for Sicily.<sup>311</sup> Lamachus, one of three generals leading the Sicilian expedition, proposes (ἔφη) that the Athenian army attack walls of the city and in view (*opsis*) of Syracuse to create the greatest division amongst the city’s allies. (6.49) Distance is fundamental to

<sup>309</sup> Also 1.143.5 on the abandonment of Attica in Pericles’ First Speech with the exception of cavalry deployments 2.19.2, 22.2.

<sup>310</sup> Dewald (2005) 59, calls this sentence “a specific focus on Athenian strategy”. See 56-60, and 58-59, where she calls 3.1 a *developed picture unit* of the Archidamian War and uses it as an example of the *formula for a military invasion*: (1) time formula “in the following summer, when the corn was growing ripe”, (2) descriptive activity “campaigned”, (3) detailed descriptive activity “established … plundered”, focus on Athenian strategy “the usual”, (4) conclusion “stayed the length of time they had provisions”. Elsewhere, the formula for a military invasion is used to “frame” another event. A Spartan invasion, which she calls a *simple picture unit* (p.90), is used to frame the plague narrative (2.47.2 and 2.54).

<sup>311</sup> Hunter (1973) 100-1, on Lamachus having learnt from the experiences of Archidamos in 431; Rood 168-170, for the indirect speeches of the council of war as “strategic guidance”; CT 3.423-425 for the three speeches of the council of war as Thucydides’ speeches, quoting Scardino (2007) 557ff.

the strategy.<sup>312</sup> The distance of the attacking army cannot exceed the limits of vision. The first sight (*τὸ πρῶτον*) the enemy will have of the Athenian army will cause the greatest distress (*μάλιστα ἐκπεπληγμένοι*, compare *eris*,<sup>313</sup> *ekplexis*,<sup>314</sup> *thorubos*<sup>315</sup>) and incline the Syracusan allies more toward defection.<sup>316</sup> Lamachus expects that the Syracusan allies will not wait to observe who will win.<sup>317</sup>

Focalizers so far have been Archidamos, Agis, and Lamachus, who in speech or thought predict the psychological reaction of the opponent at the moment the invading army comes into sight. Archidamos simply says men fall into anger “on the spot” *ἐν τῷ παραυτίκα*,<sup>318</sup> to which Lamachus elaborates: if we “fall upon them unexpectedly”<sup>319</sup> ... “the sight of them (they would never seem as numerous than on the first view) would persuade them primarily by the expectation of the immediate danger of battle” (*τῇ προσδοκίᾳ ὃν πείσονται, μάλιστα δ' ἀν τῷ αὐτίκα κινδύνῳ τῆς μάχης* 6.49.2-3). For this reason Agis is counting on the sight of the size of his army (*στρατιὰν πολλὴν ἔδοι σφῶν*, 8.71).

There is a difference in timing between Lamachus’ and Archidamos’ strategic interaction. If the players devise the interaction as static, for the moment the invader is seen, why is Archidamos’ invasion with delay not different from Lamachus’ plan to move with alacrity? The time it takes to arrive “in sight” determines how many people and how much property the invaders can seize before the evacuation of the countryside into the city is

<sup>312</sup> At a distance in sight: 2.21.2, 6.49.2; also Rood 66, on 3.73.3 and “the importance of being seen”.

<sup>313</sup> 2.21.3 of the Athenians division of opinion, see 6.35 for very close verbal matching and the same *constructio ad sensum* “the Syracusan demos were in great distress”, and also caused a division of opinion.

<sup>314</sup> 4.125.1, 126.1.

<sup>315</sup> 8.71.1.

<sup>316</sup> For first as the worst: Corcyrean stasis; with specific reference to this episode 6.49.2 and 7.42.3

<sup>317</sup> Note the use of ‘overlook’ *οὐ περιόψεσθαι* at 2.20.4 and “watch and see” *οὐ περισκοποῦντας* at 6.49.4.

<sup>318</sup> HCT 2.11.7 ad loc. for other instances in the *History of parautika* used adverbially (with the article). Pay special attention to the only other identical instance of the phrase at 7.71.7 where the moment of defeat is the moment of greatest shock.

<sup>319</sup> Both use the verb *προσπίπτω*.

completed. The property left outside the walls is valuable. Archidamos ‘lost time’ at Oenoe and this allowed the Athenians to evacuate the countryside in time (ἐσκομίζοντο... 2.18.4; ἐσκομίζομένων... 6.49.3). Lamachus insists they not lose time and seize resources (6.49.2). Not only does Lamachus’ indirect speech contain clear verbal matching with the narrative of the first invasion of Attica, but it also shows how the character of the players Archidamos and Lamachus, slow and fast respectively, determines the payoffs.<sup>320</sup> Although the first invasion is conceived by Archidamos as a strategic interaction, where both players move at the same time at the moment the opponent sees the invading army, the payoffs to the invader will be higher if he is quick and lower if he is slow.

This structured analysis helps to clarify that Lamachus’ strategy, which is usually translated as an “attack” on Syracuse, is optimal. He proposes that the Athenians do battle right up against the city as quickly as possible” (6.49). Note that Lamachus and Archidamos stress that the troops must go “up to” or “near” the city (πρὸς αὐτὴν τὴν πόλιν, 2.20.4; πρὸς τῇ πόλει, 6.49.1). Lamachus’ strategy is a positioning<sup>321</sup>, but also an attack. Lamachus’ argues in favor of an Aggressive strategy, because he believes that a Passive strategy would in time devolve into a ‘revival of courage’ and ‘contempt’ for the invader (6.49.2, 6.63.2),<sup>322</sup> uniting the Syracusan alliance as opposed to dividing it.

<sup>320</sup> On ‘lost time’ at 2.18.2-3 (ἐνδιετρίμαν χρόνον) and 7.42.3 (διατρίβειν); If the positioning was slow, the lost time gives the enemy the opportunity to bring valuable resources into the city (i.e. people and property) otherwise left outside at 2.18.4 (“during this time, the Athenians brought in their property ... but the Spartans would have seized everything still outside if they had moved quickly”, ἐσεκομίζοντο ἐν τῷ χρόνῳ τούτῳ... ἀν διὰ τάχους πάντα ἔτι ἔξω καταλαβεῖν) and 6.49.3 (“in the countryside many people and property would be left outside ... and while they were bringing them in providing rich pickings for the army”, ἐν τοῖς ἀγροῖς πολλοὺς ἀποληφθῆναι ἔξω... καὶ ἐσκομίζομένων αὐτῶν τὴν στρατιὰν οὐκ ἀπορήσειν χρημάτων). Cf. 6.45.

<sup>321</sup> For implicit references to “Lamachus’ attack Syracuse strategy”, note that Nicias ‘did not attack at once’ (οὐκ εύθὺς ἐπέκειντο) at 6.63.2 and that Demosthenes believes this to be the cause of Nicias’ failure 7.42.3 (οὐκ εύθὺς προσέκειτο). The verb *proskeimai* describes motion to location or simply location beside, near, lying before, see 4.112 used for “lying before a wall”.

<sup>322</sup> Rood 169ft.46, note the repetition of the terms ‘revival of courage’ (ἀναθαρσεῖν) and ‘contempt’ (καταφρονεῖν) at 6.49.2 and 6.63.2.

### Demosthenes' Counterfactual (413 BC)

After Alcibiades' recall to Athens and Lamachus' death, Demosthenes reflects back on the council's decision to follow Alcibiades' plan to wait, which Nicias had inherited.

ο δὲ Δημοσθένης ιδών ώς εἶχε τὰ πράγματα καὶ νομίσας οὐχ οἶόν τε εἶναι διατρίβειν ούδὲ πισθεῖν ὅπερ ὁ Νικίας ἔπαθεν (ἀφικόμενος γάρ τὸ πρῶτον ὁ Νικίας φοβερός, ώς οὐκ εὔθυς προσέκειτο ταῖς Συρακούσαις, ἀλλ' ἐν Κατάνη διεχείμαζεν, ύπερωφθη τε καὶ ἔφθασεν αὐτὸν ἐκ τῆς Πελοποννήσου στρατιᾱͅ ὁ Γύλιππος ἀφικόμενος, ἢν ούδ' ἀν μετέπεμψαν οἱ Συρακόσιοι, εἰ ἐκεῖνος εὔθυς ἐπέκειτο: ικανοὶ γάρ αὐτοὶ οιόμενοι εἶναι ἀμα τ' ἀν ἔμαθον ἥσσους ὄντες καὶ ἀποτειχισμένοι ἀν ἥσαν, ὥστε μηδ' εἰ μετέπεμψαν ἔτι ὁμοίως ἀν αὐτοὺς ὀφελεῖν ), ταῦτα οὖν ἀνασκοπῶν ὁ Δημοσθένης, καὶ γιγνώσκων ὅτι καὶ αὐτὸς ἐν τῷ παρόντι τῇ πρώτῃ ἡμέρᾳ μάλιστα δεινότατός ἐστι τοῖς ἐναντίοις, ἐβούλετο ὅτι τάχος ἀποχρήσασθαι τῇ παρούσῃ τοῦ στρατεύματος ἐκπλήξει.

Demosthenes at once saw how matters stood; he knew that there was no time to waste, and resolved that it should not happen with him as it had happened with Nicias. For Nicias was dreaded at his first arrival, but when, instead of at once attacking Syracuse, he passed the winter at Catana, he fell into contempt, and his delay gave Gylippus time to come with an army from the Peloponnesus. Whereas if he had struck immediately, the Syracusans would never even have thought of getting fresh troops; strong in their own self-sufficiency, they would have discovered their inferiority only when the city had been actually invested, and then, if they had been sent for reinforcements, they would have found them useless. Demosthenes, reflecting on all this, and aware that he too would never again be in a position to inspire such terror as on the day of his arrival, desired to take the speediest advantage of the panic caused by the appearance of his army. (7.42.3)

The counterfactual reasoning expressed by Demosthenes' focalization (7.42.3)<sup>323</sup> is that if the Athenians had adopted Lamachus' strategy, then the Syracusean panic (*ekplexis*) would have enabled the Athenians to complete their siege circumvallation and take the city.<sup>324</sup> This is a complex counterfactual, in that "if x had happened, y would have happened and z would not have happened" The explanatory variable "first attack" (*τὸ πρῶτον*) when made upon the city "immediately" (*εὐθὺς*) implies likely success for the Sicilian Expedition (i.e. causes most fear - μάλιστα δεινότατός) and "later" (*διατρίβειν*) implies that success is not as likely (i.e. causes contempt because it is "familiar"- *ύπερώφθη*). The latter contempt allows the opponent to act with greater calm and in favor of a less risky defensive strategy. In Nicias' case when he did arrive, the Syracuseans instead of coming out to attack in full force, replied by building counter-walls and employing only part of their army for defence, of which the cavalry was a main force. (6.99.2)

This basic strategic game is developed in 1. Archidamos' correct predictions of the Athenians' psychological reaction, 2. Agis' ineffective repetition of the strategy, 3. Lamachus' proposal, and 4. Demosthenes' counter-factual reasoning. Together these form a complete description of the strategic environment for a first attack.<sup>325</sup>

Archidamos' *First Invasion of Attica* is a strategic game, because of the strategic motivational analysis of the first visual reaction of the opponent and not because it is part of a program of yearly invasions. A strategic game is commonly interpreted "as a model of an event that occurs only once",<sup>326</sup>

<sup>323</sup> CT 3. ad loc. for counterfactual reasoning, and also whether this is Thucydides or Demosthenes focalization, see also Rood 67, 67ft.21, 161ft.7. Also see CT 3. ad loc. 6.50.1 on Thucydides, who guides the reader, "We are meant to think counterfactually: what if Lamachos' view had prevailed?".

<sup>324</sup> See 8.96.4-5, Thuc. himself believes this strategy could have led to a victory for the Spartans earlier than 404 BC.

<sup>325</sup> See Hunter (1973) 23-27 for another prognostication of the "first onslaught" by Brasidas, *τῇ τε πρώτῃ ὥρῃ* (4.127.2) and again Nicias "when they fail in the first contests", *οἱ τοῖς πρώτοις ἀγῶσι σφαλέντες* (7.61.2).

<sup>326</sup> Osborne, Rubinstein (1994) 13.

This particular type of strategic interaction requires that it be the **first** encounter between players. **An event happens for the first time only once.** Archidamos, Lamachus and Demosthenes also constrain their strategies to include the first visual interaction. In contrast, Agis employs the strategy in order to replicate the reactions of the first invasion and fails. Although the game clock begins with the crossing of the border into Attica, the interaction proper is only realized when the invader comes into sight. These phases of the *agon* will be discussed in greater detail in the next game. Now, I introduce the formal presentation of the game utilising the standard layout of the Descriptive theory and the Solution Theory.

## Descriptive Theory

The **players** in *The First Invasion of Attica* are the Athenians and Archidamos: a group of people and a single man. Standard game theory assigns numbers to players: Player 1 and Player 2 will represent the Athenians and Archidamos, respectively. The **actions** available to both players are policy decisions to either be Aggressive or be Passive, denoted A and P. The **payoffs** are the relative benefits to be accrued as a result of the interaction. These payoffs represent **ordinal preferences**: one outcome is preferred to another outcome without reference to magnitude, i.e. how much more. The summary of an interaction is usually presented as a list of the descriptive elements.

**Players:** 1, 2

**Actions:** Set of actions for each player {A, P}

**Preferences for Player 1:** For Player 1 the *action profile* in which he chooses Passive and Player 2 chooses Aggressive is ranked highest (resulting in being unharmed), followed by any action profile in which Player 2 chooses Passive (resulting in Player 1 being indifferent), followed by the

action profile in which Player 1 chooses Aggressive (which results in fore fitting battlefield advantage).

**Preferences for Player 2:** For Player 2 any action profile in which he chooses Passive (resulting in stasis within the enemy state) ranks higher than any action profile in which he chooses Aggressive (resulting in his state being harmed by expenditure and disrepute).

An *action profile* assigns one action of each player to an outcome (per node in extensive games). An action profile is a function that represents the list of actions of both players:

$$f(\text{Player 1}, \text{Player 2}) = (\{\text{Passive}_1, \text{Aggressive}_1\}, \{\text{Passive}_2, \text{Aggressive}_2\})$$

In this case, it is convenient to add a subscript 1 and 2 to identify what actions are Player 1's and what actions are Player 2's. However convention dictates that the first action in the bracket is Player 1's and the second action is Player 2's.

Player 1's ordering of action profiles:  $(P, A) > (A, P) \sim (P, P) > (A, A)$  <sup>327</sup>  
 Player 2's ordering of action profiles:  $(A, P) \sim (P, P) > (A, A) \sim (P, A)$

The *utility function* represents the payoffs of the ordinal preferences over action profiles. The payoffs of player 1 are  $u_1$ 's and the payoffs of player 2 are  $u_2$ 's. The utility function assigns values to each action profile:

$$\begin{array}{ll} u_1(P, A) = a & u_2(A, P) = u_2(P, P) = d \\ u_1(A, P) = u_1(P, P) = b & u_2(A, A) = u_2(P, A) = e \\ u_1(A, A) = c & \end{array}$$

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<sup>327</sup> The symbol (  $\sim$  ) means “indifferent”.

Each player has his own utility function, incommensurable with one another. We could just as easily let  $a = 3$ ,  $b = 2$ ,  $c = 1$  and  $d = 2$ ,  $e = 1$ , which would facilitate the reading of preference ordering. Numbers are a natural ranking system.

		PLAYER 2	
		PASSIVE	AGGRESSIVE
PLAYER 1	PASSIVE	( 2, 2 )	( 3, 1 )
	AGGRESSIVE	( 2, 2 )	( 1, 1 )

Table 4

Player 1's payoffs and Player 2's payoffs have no relationship whatsoever. The numbers are only significant in so far as they assign payoffs to independent ordered action profiles, i.e. outcomes.

#### Types of Strategic Games with Ordinal Preferences

The game analyzed above is a  $2 \times 2$  game (transliterated as a “two by two game”). This means that each player has two actions, and thus there are four possible outcomes. *The First Invasion of Attica* is not a **strict ordinal game**. This is why. Strict ordinal  $2 \times 2$  games result when each player's ordinal payoffs are 1, 2, 3 and 4 in some arrangement. There are 78 strategically distinct strict ordinal games. *The First Invasion of Attica* is instead a **general ordinal  $2 \times 2$  game**, where one or both players may be indifferent between two (or more) of the four outcomes. There are 8 orderings for **ordinal  $2 \times 2$  games**: 1,1,1,1 indifferent among all four; 1,1,1,2 indifferent among three least preferred outcomes; 1,1,2,2 indifferent among

two at least, which is Archidamos' ordering,<sup>328</sup> 1,1,2,3 indifferent between two least preferred; 1,2,2,2 indifferent among three most preferred; 1,2,2,3 indifferent between two middle, which is the Athenians' ordering; 1,2,3,3, indifferent between two most preferred; and 1,2,3,4 distinct levels of preference for each outcome. All of these are *general* orderings, except for the last one which is *strict*.

## Solution Theory

		PLAYER 2	
		PASSIVE	AGGRESSIVE
PLAYER 1	PASSIVE	( 2*, 2* )	( 3*, 1 )
	AGGRESSIVE	( 2*, 2* )	( 1, 1 )

Table 5

The descriptive theory of games is coupled with a solution theory, which takes many different guises: algorithms, assumptions, belief extensions, and so on. The most basic type of solution concept is solving for **dominant strategies**, as we did in the *The First Invasion of Attica*. The Athenians have a **weakly dominant strategy**, Passive. The rationale for weak dominance for Thucydides is justified by the distribution of voters.<sup>329</sup> The dominance solution concept assumes that each player will choose the best

<sup>328</sup> Note this ordering is equivalent to 2,2,3,3 or 1,1,3,3, value of the numbers is irrelevant, only the order.

<sup>329</sup> Osborne (2004) 359, for the difficulties with weak dominance. "The rationale for choosing a weakly dominated action is very weak: there is no advantage to a player's choosing a weakly dominated action, whatever her belief." In our game the rationale is described as a probability distribution over actions (mixed strategy), which captures the belief of a group vote. Rubinstein (1991) 913ff. on group decision-making as potentially indifferent, only as a collective while they individually play pure strategies.

possible action given the action of his opponent. Recall that each player picked an action given the strategy choice of the opponent. The outcome with the highest-ranking payoff got a star, this is called a **best response**. Both players best responded to each other's strategy choices, yielding two outcomes where both payoffs are starred. The action profiles (P,P) and (A,P) are called *Nash equilibria* (NE). These two Nash equilibrium outcomes are the solutions.

A Nash equilibrium is a prescriptive and/or normative rule of play that seeks to predict how players *would* and/or *should* act. In Thucydides, this rule is consistently violated for different reasons, as it is in real life. However, Thucydides' description of Archidamos' thinking and actions shows that players independently calculate in accordance with dominance. I picked *The First Invasion of Attica* as the first example because nowhere else<sup>330</sup> in the *History* are a character's predictions of preferences and actions met with straightforwardly near accurate outcomes as here. Standard solution based analysis requires that players know each other's actions and rules of play, each other's payoffs, and that each maximizes his payoffs given the actions of the opponent. In the *History*, Thucydides' ongoing concern with *pronoia* and *xunesis*, exposes the mismatch between most of the players' predictions of interaction and the observed rules of play.<sup>331</sup> Thucydides' description is in fact closer to reality than a description, which fits 'observed' outcomes to "rational thinking", as the Nash equilibrium does.<sup>332</sup> The valuable description Thucydides' gives us connects thinking about preferences with actions. This form of "theorising" is based on a player's prediction of cognitive processes, rather than on an abstract mathematical demonstration that explains outcomes.<sup>333</sup>

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<sup>330</sup> To my knowledge so far.

<sup>331</sup> Hunter (1973) 23-41 in particular on Brasidas' ability to conjecture from knowledge (*eikazo*, and *epistamai*, 4.126.4) and repel the first assault (4.127.2), esp. p.29 "pronoia or prognosis – the statesman's primary virtue – is the ability to reason from *eikóς*."

<sup>332</sup> The Nash equilibrium, however has been shown to be a reliable predictor in evolutionary processes where "rational thinking" is transformed into survival fitness. Strict rationality is relaxed, see Maynard Smith (1982).

<sup>333</sup> On the interplay of abstract concepts and history, selectivity and data, or deduction and induction, see Morley (2013) on W. Roscher's interpretation of Thucydides.

## Zero-sum Games (Constant Sum Games)

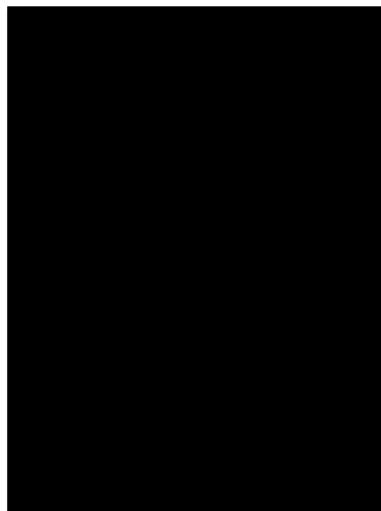
### “SEEING” AS SELECTION

The reason the world around us “makes sense” is that we accept some stimuli and exclude others; we also accept the *linking* of certain groups of stimuli and exclude the linking of others. ... Once we have seen the camouflaged figure, however, we have selected the proper linkages and have facilitated their repeated selection. We will then continue to see the figure without difficulty.

The principle can be demonstrated in the ambivalent picture, [below] ... a young woman elegantly dressed ... or an old, surly looking woman. ... To see both at once is not easy, however: the images compete for recognition.

Anatol Rapoport, *Fights, Games, and Debates*<sup>334</sup>

Figure E: The Boring Woman



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<sup>334</sup> Rapoport (1960) 252-255, Anatol Rapoport (b.1911 - 2007) was a psychologist, mathematician and game theorist. Picture taken from pg. 253, reproduced there with the “Permission of Dr. E. G. Boring”. “The Boring Women” illustrates the *Weltbildapparat* (i.e. “our equipment for building a world view”(Konrad Lorenz)) which is a cognitive model of *epistemology* of the Gestalt method, a constructivist theory.

### The Sea battle in the Great Harbour at Syracuse (413 BC)

The Athenians launch an expedition to conquer Sicily in the summer of 415 BC. Their principle opponent in Sicily is the city-state of Syracuse. The sea battle in the Great Harbour at Syracuse is described as the turning-point (413 BC) of the war in Sicily (415-13 BC). The narrative structure is as follows (7.69.3-71). It is structured according to a three-fold schema: the point of view of the combatants, the point of view of the spectators, and the outcome. Each section is marked by a superlative descriptor.

In the first section, the narrative of the action, there is a top-down presentation of ranking officers. On one side, the three Athenian generals command the fleet, and whilst on the other the Syracusans together command the three fronts. The fleet on both sides is described as being distributed in three units of command. The command structure is further dissected. On either side, the captains of each ship (*trierarchoi*) command the rowers (*nautai*), the helmsmen (*kubernetai*) and the soldiers on deck (*epibatai*). These three actors are given a point of view, which Thucydides emphasizes by presenting the crew again from back to front: *epibatai*, *kubernetai*, *nautai*.<sup>335</sup> The battle is described as such a hard fight, unlike any encountered before.

The spectators' section follows the action section. The point of view of the spectators is presented in a three-fold vision of the collective action at sea. Some look where their own were winning, others look where their own were losing, and others to where the fighting was equally balanced. The spectators' fear for the outcome is like nothing they had ever experienced.

Lastly, the combatants' fears for the outcome are mimicked by those of the spectators. The outcome is revealed in a curt statement that the Athenians are routed back to shore. The actions of the spectators are now described

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<sup>335</sup> Rutter (1989) 55-6.

as some ... some ... others. The whole army is said to face the greatest panic they had ever known. We shall see that the layers of command are simply jettisoned in this context.

This episode has interesting similarities to Thucydides' pathology of the disease that caused the outbreak of plague (430 BC). The progress of the symptoms of the disease through the body is top-down (2.49.7) from the head to the whole body.<sup>336</sup> It appears to be analogous to the top-down description of the two navies from the generals to the whole crew. Every transition of the disease is marked as the 'the most severe', and that when the disease is at its height (*acme*) there is a physical resilience after which most die in 7 to 9 days. This sea battle is likewise the 'hardest'<sup>337</sup> and most of the army dies at the slaughter of the river Assinarus on the eighth day of their retreat by land.<sup>338</sup> This is particularly relevant since the Athenian general Nicias compares the army to a city, for which the 'city = body' equality is a common analogy. The sea battle here has long been thought to be the turning-point of the Sicilian Expedition, like Pylos is thought to be for the *Archidamian War* (referring to the first 10 years of the Peloponnesian War, 431-421 BC).<sup>339</sup>

The motif-of-three is well developed in Books 6 and 7 (the Sicilian books). Alcibiades argues that the city must be represented not as a division between young and old, but into three parts, with ordinary types in the middle between the 'inferior' and the 'supremely calculating' (6.18). The

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<sup>336</sup> CT 2. 316-327, observes here "ἰσχυράí for which the doctors 'notoriously overwork', and the appearance of ὀντισχούσης τῆς ναυμαχίας at the conclusion of the sea battle, 7.71.5.

<sup>337</sup> 7.70.2-3; Cf. 7.64.2.

<sup>338</sup> 2 days after the sea battle 7.75.1-2, they begin their retreat by land. For a review of the structural function of numbers in Homeric epic, see Douglas (2007) 101-114, esp. on Homer's "poetry by numbers" for the "eight-day model of days in the centre of the numerical ring" in the *Iliad*. The ring ends in funeral games and prizes. We will see that Thucydides model appears to borrow from these ideas.

<sup>339</sup> For turning-points in Thucydides as crisis points of a disease, Finley (1942) 70; for this episode see CT 3 ad loc; Rechenauer (1991) 260-2, esp. on 7.69-71 and 3.82; contra Kern (1989) 82, who sees Gylippus' arrival as turning-point of the Peloponnesian war (79, 80), which will be addressed in the next game. Bloedow (1991) 1-8, for Epipolae as turning point. The discussion herein interprets crisis points as part of a medical analogy, and thus are not singular events.

combination of all three, he argues, best supports the city.<sup>340</sup> The presentation of a *spectrum of extremes divided* is reiterated in the types of spectators and views of those at the launch of the Athenian fleet to Sicily in 415 BC (6.24) - the young men, the mass of military troops, and the old men. The motif-of-three ultimately extends into tactic in the building operation of walls and counter walls as South, Centre, and North, in an Athenian attempt to take Syracuse by building a circumvallation wall. The Athenians fail to complete the circumvallation wall, which inaugurates the motif-of-two's. Everything now depends on the fleets, so that the two sea battles of "ship on ship" are used as brackets for a ring composition (see below) before the Athenians are forced to retreat by land. The Athenians defeated at sea are now turned into a city, which inaugurates the motif of one, or the body.<sup>341</sup> The immediate aftermath of the defeat at Athens reiterates the private loss of each man and the state.<sup>342</sup>

The Sicilian books thematically present the development of walls-navy-army. We shall see in the following game how the motif of three was intended for the contest with walls (three feasible actions - North, Centre, South), while this is a contest with ships where Thucydides is finalizing the motif of two (two feasible actions – ram or back water).<sup>343</sup>

<sup>340</sup> Rutter (1989) 17, see 6.18.6 "the greatest strength is developed when one has a combination of the inferior types, the ordinary types and the supremely calculating types", τὸ τέ φαῦλον καὶ τὸ μέσον καὶ τὸ πάνυ ἀκριβές ἀν ξυγκραθὲν μάλιστ' ἀν ισχύειν.

<sup>341</sup> Esp. as it feeds back into the presentation of an expedition for colonization, 6.23.2 "found a colony", 6.37.2, take to Sicily "another city as big as Syracuse" (i.e. to colonize), and 6.63.3. Athens was effectively sending out a city to Sicily. Also note the *lyric exchange* between the "heroic impulses of Athens" and "Nicias as choral figure", like that between an actor and chorus, Edmunds (1975) 130. Nicias "played the role of tragic warner", Hunter (1973) 187, Rood 163-4 for the "close responson between warning and realization", also for conquest of Sicily as a "great deed (*ergon*)" in the Homeric style, 6.8.4, 7.87.5 with Pericles on Athens' great deeds 2.64.3. In the last phase of the expedition, a Periclean Nicias dons the role of the mind of the body politic.

<sup>342</sup> 8.1.2, and Rood 198ft.70, for a link to the correlation of private and public in Pericles' *Epitaphios* 2.44.3.

<sup>343</sup> In Thucydides, the motif of one, of the city filled with men (army), comes after, and we must keep in mind that the idea is found generally in the Ancient Greek historians. For "the army as *polis*" see Hornblower (2011) 226-249. Walls disappear from the narrative at 7.60.3, and ships at 7.74.2. See Nicias' speech (7.64.2): "you who go on board are the army and navy", with Dover (1965) ad loc. Whereas after the sea battle in the Great Harbour the focus is on the city (7.77.7): "if you now escape the enemy, you will again raise up the power of the city, fallen though it is: men make the city and not walls or ships without men in them", see Rood 196, esp. ft.63, 64 there: the motivation for calling the city a motif of one comes from von Neumann, Morgenstern (1944) 86-7, on the equivalence of "the

## Ring Composition and Chiasmus

The rhetorical syllogism and enthymeme evolved from chiasmus, the ABB'A' structure, through ring composition, the ABA' structure, which differs from the chiasmus only in its central or pivotal element.<sup>344</sup> Although the ring composition is not a dominant compositional principle in Thucydides,<sup>345</sup> it still is intricately developed in certain books, particularly book 1<sup>346</sup> and book 7<sup>347</sup>. Scholars have shown that this sea battle (60.3-71) is inserted in the narrative of book 7 at the very end of a complex ring composition that begins at 50 and ends at 71. It performs the function of a final argument.

### Initial naval battle (50-54)

Athenian discouragement (55)

Initial statement of Syracusan plan (56): close harbour, win battle

*the wondrous victory prize*, 56.2, καλὸν... ἀγώνισμα

catalogue of allies (57-58)

*the wondrous victory prize*, 59.2, καλὸν ἀγώνισμα

new statement of Syracusan plan: capture whole army, 59.2  
harbour closed, 59.3

Athenian discouragement, 60

### second naval battle, 60.3-71<sup>348</sup>

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rigidly established communistic society" in which the interests of all members are aligned – "i.e. the Robinson Crusoe form of economics". "This setup must be treated as a one-person game". This corresponds to the Periclean ideal, which is against internal conflict/ coalitions and "imperfections of communications among members". Here comparative statics are used.

<sup>344</sup> Doxiadis (2012); Douglas (2007).

<sup>345</sup> Dewald (2005) 207ft.1.

<sup>346</sup> Hammond (1952) 127-41; on *Pentecontaetia*, McNeal (1970) 306-25; on the *Archaeology*, Katicic (1957) 179-96; Connor (1984) 30-32, 251, (1985) 6-7 as "demonstration piece", Ellis (1991) 345-6, and also Hunter (1973) 14.

<sup>347</sup> Connor (1984) in "ring composition in 7.50-71"; Hornblower (2004) 338; CT 3 ad loc. 6.76, on Hermocrates' speech and 7.86, on the death of Nicias.

<sup>348</sup> Hornblower (2004) 338, copied exactly; Connor (1984) Appendix 9, states that "the structure is part of a steady crescendo". For other ring compositions in Thucydides see Connor (1984) Appendices 1, 2, 3, 4, 6, 7 and Ellis (1991); cf. Roscher (1854) 1.82ft.119, after noting the idea of logical circularity in Thucydides, argues that "one-sided deduction of A from B, and B from C, etc. ... is the result of overlooking reciprocal action".

### The board - Type of battle

This is most importantly a turning-point type of battle (*krisis*). In book 1, Thucydides provides an implicit definition that crisis points in war are key battles. The Persian war was decided (*krisis*) by two land battles and two sea battles. (1.23.1-2) There he notes that the Peloponnesian war was long and its disasters were of “a type unlike any” that had befallen Greece before (*οἵα οὐχ ἔτερα*). In the description of the sea battle, Thucydides not only employs a medical analogy as a stage of a disease through a superlative, but also describes it as “a type unlike any” that came before (*οἵα οὐχ ἔτέρα*). Finally, in the opening statement of the action, he employs the term ἀγωνισμός, a *hapax legomenon*. That is, the term appears “once and only once”. It is used to describe the *agon* as turning-point.<sup>349</sup>

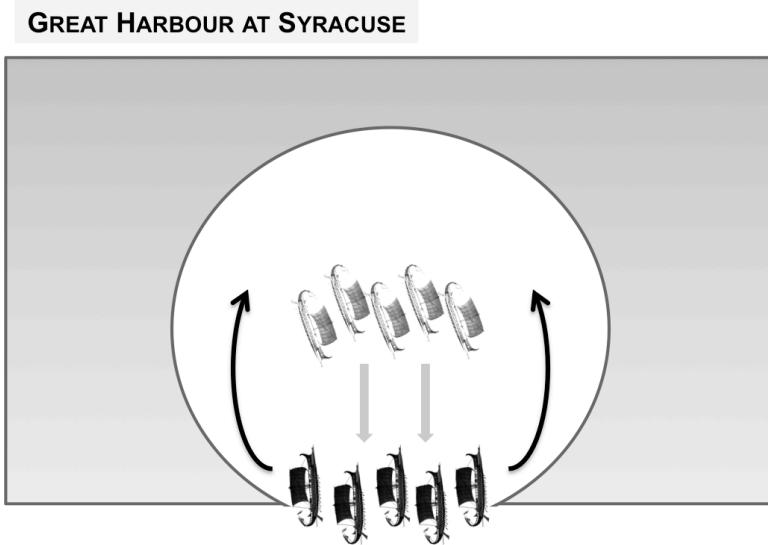


Figure F

<sup>349</sup> Allison (1997a) 122ff. a verbal *-mos/ma* noun “conveys a product sense and so the referents possess a closer proximity to physical objects” especially compared with *-sis* nouns of the same stem which denote a concept (e.g. *poeisis*, *poima*). Allison regards *agonismos* as “artful” since she assumes that Thuc. was attempting to avoid an *homoioteleuton* with *antitechnesis*. My reading here should reveal that this was not a case of *variatio*, but in fact Thucydides does distinguish clearly between *agonisis* and *agonismos*.

Thucydides defines this type of battle, like his type of military armament programmatic “they went/ attacked/ traveled by land and/or by sea”. This sea-battle is “fought in the harbour” (ἡ ναυμαχία, ἀλλὰ καὶ κατὰ τὸν λίμενα, 7.70.2). “This was a battle in a very small space between a very large number of ships” (7.70.4).<sup>350</sup> Opponents do not order in a single line of attack (lines abreast), as in sea-battles in open water (ναυμαχίαν μὲν ... ἐν πτελάγει, 7.62). The Athenians pierce, while the Syracusans engulf (κύκλῳ λιμένα, 7.70.1, Cf. 59.3). (See Figure F) The Athenians need to break the blockade, i.e. the chain (τὰς κλήσεις, 7.70.2) at the mouth of the harbour, in order to escape.<sup>351</sup>

As a result of the Syracusan blockade to keep the sea-battle within the harbour, the board of the game, or the boundary of actions, is compact (πικνότεραι ἡσαν, 7.70.4).<sup>352</sup> The principle characteristics are a confined space and large numbers. The catalogue of ships has already impressed the theme of numbers in “the largest number of nations ever to converge on a single city” and proceeds to “list the nationalities who were there on either side to attack or defend Sicily” (7.56.3-4). The theme of large numbers extends into the preparation for the sea battle when the Syracusan plans are focalized by the narrator: “There was nothing small-scale in any of their plans” (καὶ ὄλιγον οὐδὲν ἐς οὐδὲν ἐπενόουν, 7.60). The Syracusan plan is then focalized through the Athenians who see (όρωσι) the Syracusans “block the mouth of the Great Harbour” and infer “the enemy’s overall intentions” (τὴν ἄλλην διάνοιαν, 7.60). The Athenian fleet is 110 ships (7.60.4), the Syracusan fleet is about 76 ships (7.52.1 and 7.70.1), and Thucydides accurately reminds the reader that there were fewer than 200 ships in the harbour manned for battle (7.70.4). Although the opposing

<sup>350</sup> The localized repetition of the theme of “small space”: ἐν ὄλιγῳ ... ἐν ἐλαχίστῳ (70.3), τὴν στενοχωρίαν (70.6); of “many ships” πολλῶν νεῶν (70.3 and 6), πλεισταῖ... (70.3).

<sup>351</sup> The chain is a tactic in itself since it cannot be encircled. Morrison et al. (2000) 160-7, see there for the fortification of the bow and the chain at the mouth of a harbour. Morrison et al. discuss how the Corinthians at Naupactus station land armies at the “horns of the crescent [of Erineus harbour], the projecting headlands on each flank.” In this way they “avoided exposing their wings to encirclement if they came out beyond the projecting headlands on each side”. In the Great Harbour, the Syracusans control both projecting headlands on each flank (Plemmyrium and Ortigia). The very fact that the Corinthians control the centre flank of the attack appears to emphasize the point.

<sup>352</sup> Compact defined as a density determined by the high frequency of encounters.

forces are of an uneven number of ships, the reader has been gradually coerced to contemplate 'power parity'.<sup>353</sup> This type of sea battle requires much counter-maneuvering, and **by necessity** devolves into actions that are knit together, tangled (ἢ ἀντιέχνησις (hapax) ... κατ' ἀνάγκην ξυνηρτήσθαι, 7.70.3, 70.6).<sup>354</sup> (See Figure G)

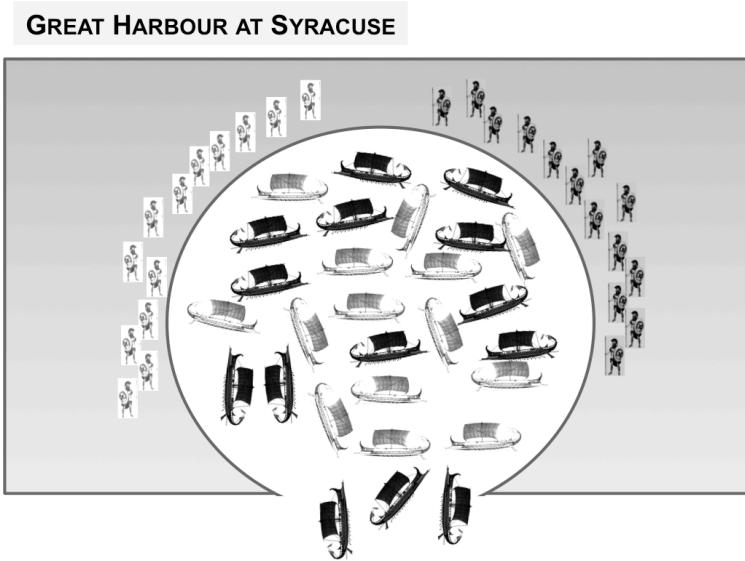


Figure G

### Players, Actions and Preferences

Who is taking actions in the battle? The Athenian generals and Syracusan generals (*strategoi*) command the fleets into battle. The Athenian generals are Demosthenes, Menander and Euthedemus who embarked on the ships, raise (ἄραντες) their camps and sail toward the blockade of the harbour

<sup>353</sup> For the theme of "same character", see CT 3.21-22, and discussions of passages ad loc.; for other themes running through the Sicilian Books see Kirby (1983).

<sup>354</sup> See 70.6 and 70.8, Shanske (2007) 166, for this type of phrase as *ananke* in an abstract sense, see Noonan (1992) 41-7, "adverbial phrases as κατ' ἀνάγκην and ὑπ' ἀνάγκης were exclusively epic or Homeric, although the history of both begins in Homer; they had made their way thence into the vocabulary of the cosmologists of the generations that preceded Thucydides" ... "in different cosmologists ἀνάγκη is demythologized and transformed into something like a mechanical principle that governs μεταβολά in the universe – particularly the growth and/or shrinking of the cosmos, of which ἀνάγκη is an inherent part.".

(πρὸς τὸ ζεῦγμα τοῦ λιμένος).<sup>355</sup> The generals in command of the Syracusan fleet<sup>356</sup> are Sicanus and Agatharchus on opposite wings, and Pythen and the Corinthians<sup>357</sup> in the centre. There are the many captains (οἱ τριηράρχοι)<sup>358</sup> and helmsmen (κυβερνήται)<sup>359</sup> on both sides (ἐκατέροις) that help the commander to give orders (κελευσθείη ἐγίγνετο, lit. sailors were being commanded).<sup>360</sup> There are also signalmen (οἱ κελευσταί)<sup>361</sup> who give orders to the oarsmen (αἱ ναῦται)<sup>362</sup> and to the armed men (οἱ ἐπιβάται)<sup>363</sup> who fight hand to hand on deck.<sup>364</sup> The command and control of communication was severely impaired, such that Thucydides describes the difficulty of hearing *keleustai* over the din and panic (ἐκπληξίν τε ἄμα καὶ ἀποστέρησιν τῆς ἀκοῆς).<sup>365</sup>

Many vessels in a small space usually led to battles fought on deck by men boarding each other's ships.<sup>366</sup> Thucydides, the narrator, writes that the sea battle was all over the harbour (7.70.2). The narrator nonetheless focuses on the contests among the vessels instead of on the simulated land battle πτεζομαχία of the marines on the decks of the ships, for which Nicias the Athenian general had prepared. Nicias correctly predicted that there would be a crowd of ships as a result of the narrowness of the harbour, ἐπὶ τῇ τοῦ λιμένος στενότητι πρὸς τὸν μέλλοντα ὅχλον τῶν νεῶν ἔσεσθαι. (Cf. στενοχωρία, 7.70.6) In contrast to the narrator, Nicias focuses on the contests on "deck", the "beams" protecting the oarsmen and the "grappling irons" to hold the ships together (καταστρώματα,<sup>367</sup> αἱ ἐπωτίδες and χεῖρες

<sup>355</sup> 7.69.4.

<sup>356</sup> With the same number as before, παραπλησίας τὸν ἀριθμὸν καὶ πρότερον.

<sup>357</sup> The Corinthians naturally had their own generals in this case.

<sup>358</sup> 7.69.2.

<sup>359</sup> 7.70.3, 70.6.

<sup>360</sup> 7.70.3.

<sup>361</sup> 7.70.6, twice. Implied at 7.70.3 but not named.

<sup>362</sup> 7.70.3.

<sup>363</sup> 7.70.3, 70.5.

<sup>364</sup> Casson (1971) 302. For inscriptions and comparative literary evidence of naval officers.

<sup>365</sup> 7.70.6, also 2.84.3, Morrison et al. (2000) 248-9.

<sup>366</sup> Cf. 1.13-14, esp. 1.14.3, Themistocles' trieres at Salamis were "not decked over all" and supposedly only partly; Morrison et al. (2000) 152-3, 158-60, on decks and *epibatai*.

<sup>367</sup> Twice 7.63.3, cf. 1.14.

σιδηρῶν, 7.62.2-4).<sup>368</sup> In the action section the narrator gives little attention to this aspect of the fight, only to mention that when one ship bore down on another (προσμείξειν), darts, arrows and stones “wound her” referring to a ship (ναῦς … ἐπ’ αὐτήν ἔχρωντο, 7.70.5) and that the armed men on deck were but trying to board to fight hand to hand (οἱ ἐπιβάται ἐς χεῖρας ιόντες ἐπειρῶντο). Thucydides instead focalizes through the sailors on shore and redirects importance toward the ships and writes that “for the Athenians everything rested upon the fleet, and fear was upon the outcome like no other” (πάντων … ὑπὲρ τοῦ μὲλλοντος οὐδενὶ ἐσικώς, 7.71.2). He describes the actual outcome of the battle as “many ships and men were destroyed on both sides”, but it was the Syracusans that set up a trophy (*tropaion*, 7.72.1). The dead men are treated as more of an afterthought.<sup>369</sup> The ships behave as agents and are treated as agents. The players in the population are the ships.

### Actions

Thucydides gives us a description of the action (πολλὴ μὲν γὰρ..., 70.3-70.6). It is placed immediately after the narrator specifies the type of battle (μετὰ δὲ τοῦτο..., 70.2.19) and it precedes the two miniature hortatory speeches (πολλὴ γὰρ δῆ..., 70.7-70.8)<sup>370</sup> :

The Syracusans plan and do attack the Athenians “from all sides” at “the same time” (πανταχόθεν, 70.1, 70.2, 70.6; ἄμα, 70.1, 70.6). The interaction is **strategic**. Now we shall see how Thucydides in the description of the action develops the concept of **binary relations** that allows a single ship to be engaged in **multiple contests** at a time. The rhetorical structure of the passage has two main elements. These are the two overlapping chiastic constructions.

<sup>368</sup> CT 3 ad loc. notes that so far in the narrative we have been “coached” on how to engage in naval warfare in constrained environments, but here there is no sign of the technical language we would expect.

<sup>369</sup> Athenians in an neglect of obligation do not collect their dead (7.72).

<sup>370</sup> CT 3 ad loc. for the miniature hortatory speeches.

όπότε προσπέσοι ναῦς νηί (ΑΒ...)

ξυμπεσουσῶν ... πολλῶν νεῶν (CD...)

ώς τύχοι ναῦς νηί προσπεσοῦσα (...Β'Α')

πολλῶν νεῶν ξυμπιπτουσῶν (...D'C')

Thematically these two structures pay special attention to 'number', which are abstractly expressed as "falling one on one ... one on one they fell" for **ΑΒ ... Β'Α'** and "falling many on many ... many on many they fell" for **CD ... D'C'**. The chiastic overlap describes a multitude of one on one contests.<sup>371</sup>

Other elements in the passage support this interpretation. First we have a variety of binary relations. The sailors on both sides are eager to attack (πολλὴ μὲν ... ἐκατέροις) and the counter-maneuvering helmsmen are in a contest of wits with one another (πολλὴ δὲ ἡ ἀντιτέχνησις ... ἀγωνισμὸς πρὸς ἀλλήλους). After the opening of the first chiasmus, we read that the soldiers on deck do not leave affairs to another (τῆς ἄλλης). Here we find a **gnomic statement**, which expresses a general principle, that everyone was given orders and each strove to appear first (πᾶς τέ τις... αὐτὸς ἔκαστος...). This kind of *all-to-each* gnomic statement we see elsewhere.<sup>372</sup> After the opening of the second chiasmus we return to a series of **binary relations** that "both sides numbered ... (ξυναμφότεραι). With the close of the first chiasmus the narrator explains these have frequent collisions, because a ship has only two feasible actions, fleeing or attacking (ἢ διὰ τὸ φεύγειν ἢ ἄλλῃ ἐπιπλέουσα). As long as one ship is bearing down on another whose crew attacks her. When the two close, the crews try to board each other's ships (ἄλλήλων ναυσὶν ἐπιβαίνειν). The binary terms or phrases such as *both*, *one another*, *ship-on-ship*, *left to another* bracket the central gnomic statement that all behaved in this way.

<sup>371</sup> Cf. 7.63.1, for Nicias' use of (ξυμπεσούσης νηὶ νεώς) *sumppto* for "ship on ship" contests.

<sup>372</sup> 1.141, see Methodology.

After this detailed description of a *one-on-one* contest with two feasible actions, Thucydides summarizes the argument in one sentence, which takes up a hefty eight lines in the Alberti edition. The impersonal and imperfective tense of the main verb (συντυχάνει “it happened that”) governs all five infinitives taking us through a multitude of simultaneous actions in order to implicitly reveal his previous emphasis on the *one-on-one* contest where either ship has two feasible actions.

ξυνετύγχανέ τε πολλαχοῦ διὰ τὴν στενοχωρίαν τὰ μὲν  
ἄλλοις ἐμβεβληκέναι, τὰ δὲ αὐτοὺς ἐμβεβλῆσθαι, δύο  
τε περὶ μίαν καὶ ἔστιν ἡ καὶ πλείους ναῦς κατ’ ἀνάγκην  
ξυνηρῆσθαι, καὶ τοῖς κυβερνήταις τῶν μὲν φυλακήν,  
τῶν δ’ ἐπιβουλήν, μὴ καθ’ ἐν ἔκαστον, κατὰ πολλὰ δὲ  
πανταχόθεν, περιεστάναι, καὶ τὸν κτύπον μέγαν ἀπὸ<sup>1</sup>  
πολλῶν νεῶν ξυμπιπτουσῶν ἐκπληξίν τε ἄμα καὶ  
ἀποστέρησιν τῆς ἀκοῆς ὃν οἱ κελευσταὶ φθέγγοιντο  
παρέχειν.

In many areas of the battle there was so little room that a ship which had rammed an enemy in one direction would find itself rammed from another, with the consequence that one ship would have two or sometimes more ships entangled around it, and the helmsmen were faced with the need to defend or attack against the enemy not just one at a time, but in multiples from all sides. And all the while the great din of so many ships crashing into one another, both terrified the crews and made it impossible for them to hear the orders shouted by the signalmen.

Although one ship fights against many, again the actions are pair-wise: to ram and to be rammed (τὰ μὲν... τὰ δὲ...), restated as the helmsmen attending to defence or to offense simultaneously (τῶν μὲν... τῶν δ’...). It is in the following lines that the tangled reality is abstracted. There were so many ships on all sides that a single ship fought off the enemy “not just one at a time” (μὴ καθ’ ἐν ἔκαστον).<sup>373</sup> This is a rhetorical device called *presentation through negation*.<sup>374</sup> The reader expects contests to be *one-*

<sup>373</sup> An echo is found at the launch of the expedition “not ship by ship but altogether” (6.32.1)

<sup>374</sup> This is a rhetorical device called *presentation through negation*, which produces an “emotionally and intellectually satisfying interaction between narrator and narratee”, as Hornblower defines it. It singles out what “*will* be talked about” by telling the reader what happens even though it may be contrary to expectation, Hornblower (2004) 348, (1994)

*on-one*. However, reality is counter-expectation and the second chiasmus emphasizes the multitude through the great din caused by the many ships falling together (τὸν κτύπον μέγαν ἀπὸ πολλῶν νεῶν ξυμπιππουσῶν).<sup>375</sup> The battle is generalized first as fought 'ship crashing into ship' (ναῦς νηὶ, 7.70.3). Pitting chance battles of ship against ship (ώς τύχοι ναῦς νηὶ, lit. "as a ship happened to attack [another] ship", 70.4). He ultimately generalizes reality as a contest of ship with ship on multiple fronts, taking defensive action against one ship whilst attacking another. Note the special attention given to shifting from συμ- "all together" to προσ- "against another" to signify the action, or better, from visualizing *many-on-many* to conceptualizing a multitude of *one-on-one*. John Finley likewise noted that Thucydides "creates the simultaneous impression of many single struggles (VII.70.6, *Suppl.*683-93)".<sup>376</sup>

Thucydides chooses to programmatically describe the contests as happening one-on-one *without specifying who is who*. In this section, there are neither Athenian nor Syracusan ships (note the recurrence of *ekateros*), but collectively anonymous ships, captains, helmsmen, marines, sailors, signalmen and so forth. The gnomic *all-to-each* with the use of the indefinite τις drives through the point of homogeneity and of anonymity. I refer from now on to a *one-on-one* contest as a pair-wise contest. Players are therefore the dense population of ships who fight in random pair-wise contests. There are two populations of players, knit together, winning and losing on both sides.

In conclusion, the narrative presents the action in a way that describes interaction with the language of generality. Thucydides uses identical

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152-153, citing de Jong (1987) esp. 61ff. for the phrase "presentation through negation" and similar examples in Homer. It may belong to "a binary taxonomy" (not male implies, but female) or multiple (not red, not green, not yellow). This could in fact be read as 'not one-on-one' as is expected, but 'one against many', and in this way it is *retrospective*, and describes the mixing. At the same time it is *prospective* because it "creates an expectation", that it 'will be one on one', see de Jong (1987) 62.

<sup>375</sup> Compare II.20.66 "the din that arose when the gods clashed in strife", κτύπος ὥρτο θεῶν ἔριδι ξυνιόντων, and the following list of duels, 20.67-74, Poseidon versus Apollo, Enyalius vs. Athena, Hera vs. Artemis, Leto vs. Hermes, Hephaestus vs. Xanthus.

<sup>376</sup> Finley (1967) 47.

phraseology, a Homeric technique, in order to emphasize that the interaction is played out as **random pairwise contests** between one unspecified ship and another unspecified ship. The *marines*' focalization of their **immediate** surroundings, “**when** ship collided with ship” (όττοτε), is placed adjacent in the text to the *narrator's generalized* narrative fact of the “**accidental** collisions of ship crashing into ship” (ώς τύχοι). Hornblower was the first to note that the presentation of these passages is chiastic ABB'A', and that methodologically this is “a special case of the frequent speech-anticipates-narrative motif”.<sup>377</sup>

Why is Thucydides forcing the pairwise contest? The answer lies in the board and its permissible actions. He tells us explicitly that there was no possibility for tactical maneuvers of trireme warfare (έμβολαί), neither backing water from frontal rams nor the sailing through a line of ships. Instead there were only collisions (προσβολαί) which allowed two actions: to escape or to attack (70.4), to ram or to be rammed (70.5), to defend or to attack (70.6), essentially to back water or to ram. To summarize, players are two fleets, two populations of ships, which interact in random pair-wise contests. The **feasible action set** contains two actions - to back water or ram.

### Preferences and Payoffs

Throughout the narrative of the Sicilian books, Thucydides has either implied or explicitly stated that both the Athenians and Syracusans share an uncanny similarity in character (όμοιότροποι, 6.20.3), military strength (7.55.2) and ability to innovate (8.96.5).<sup>378</sup> Nicias says that “the life and victory of all” lies in the hands of anyone who (τίς) can “display” any different skill or courage, at this moment of crisis (7.64.2).<sup>379</sup> One man could tip the

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<sup>377</sup> CT 3 ad loc.

<sup>378</sup> In Nicias' speech ομοιοτρόπως 6.20.3, and also in authorial comments at 7.55.2, 8.96.5, see CT 3.21-22, also Avery (1973).

<sup>379</sup> See esp. Rood 164, who comments on 7.55.2 for the Athenians' inability to apply against the Syracusans any difference either by a change in their constitution or by a superiority of force. This is part of the tragic pattern as “knowledge too late”.

balance. Unlike the war between Athens and Sparta, where the opponents are of opposite character, Athens faces an opponent 'exactly' like itself. The population of players can be said to be homogeneous, and therefore we should expect actions and reactions to be alike as well.<sup>380</sup>

What stands out immediately when discussing preferences is that motivations for backing water or ramming, whether of the captains or helmsmen, appear to be absent. Everyone strove to be first at their duties despite the fact that the din prevented any commands from being heard. Collisions are haphazard and are beyond the control of any ship. The only motivation a ship had was "an immediate struggle for victory" (τρὸς τὴν αὐτίκα φιλονίκιαν, lit. love of victory, 70.7, 71.1).<sup>381</sup> Preferences over outcomes are left without description, in the sense that if two ships came at each other there is no way of knowing who would win! The four possible outcomes themselves are: ship rams ship (Ram, Ram), one ship rams while another flees (Ram, Back water) and (Back water, Ram) and both back water (Back water, Back water). The last miniature hortatory speech delivered by the generals on both sides (έκατέρων) describes their reaction to seeing ships without necessity backing water from one another (μὴ κατ' ἀνάγκην πρύμναν κρουόμενον).<sup>382</sup> Still no single strategy is said to be more effective than another - will a ship win if it rams a ship which is ramming?, or will a ship win if it rams a ship which is backing water?.

### **What then is the preference relation of a fleet?**

The combination of actions are described in the narrative, however the winner or loser of each outcome (action profile) is left without description. In this case we must account for all possible combinations of victory or defeats

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<sup>380</sup> Cf.7.55, homogeneity is an exogenous quality of the players; see Allison (1989) 116, for the "similarity between Syracuse and Athens" as an "external factor".

<sup>381</sup> Rood 155ft.94, on the ambivalence of the term at 7.28.3, has a negative association at 1.41.3, 4.64.1, 5.111.4, but positive in the sea battle, and perhaps 5.32.4. Also used in *stasis* contexts, 3.82.8, 8.76; Cf. προθυμία, "eagerness" 70.3 and προθύμως 70.7.

<sup>382</sup> Again 70.7 are addressed in order ring order ABCBA': Athenians, Syracusans, Both, Athenians, Syracusans. To back water without necessity is the gnomic statement, the pivotal element, see Doxiadis (2012) 347-9.

for an Athenian or a Syracusan ship for every possible outcome. There is yet another peculiar form to Thucydides' presentation of payoffs: the winnings are presented as positive - "a prize", whereas the losses are presented as negative - "the destruction of fatherland". Both stand to lose their fatherland, and both sides stand to win a prize.<sup>383</sup> There is the repetition of the 'win all' or 'lose all' payoffs in the speeches of the Syracusan generals (7.66-68) and of the Athenian general Nicias (7.61-64). Both talk of the *agon*: "the generals and Gylippus", exhort their allies telling them that "your achievements so far have been glorious and the contest will be for glorious rewards", (καλὰ τὰ προεργασμένα καὶ ὑπὲρ καλῶν τῶν μελλόντων ὁ ἀγών ἔσται, 7.66.1). Nicias on a solemn note addresses the army: "The contest will have the same importance for every one of us. We shall all be fighting for our lives and for our country, just as much as the enemy", (ὁ μὲν ἀγών ὁ μέλλων ὁμοίως κοινὸς ἄπασιν ἔσται περὶ τε σωτηρίας καὶ πατρίδος ἐκάστοις οὐχ ἥσσον ἢ τοῖς πολεμίοις· 7.61.1).<sup>384</sup>

The prize as fatherland motif is repeated in the sea battle itself through the miniature hortatory speeches to the Athenians to save their fatherland and to the Syracusans to prevent the prize from escaping to expand their fatherland (περὶ τῆς ἐς τὴν πατρίδα σωτηρίας νῦν, ... καλὸν εἶναι κωλῦσαι τε αὐτοὺς διαφυγεῖν ... πατρίδα ἐπαυξῆσαι 70.7).<sup>385</sup> Both are competing for destruction of the other's fatherland, which is to say that one player's benefit (+1) is the other player's loss (-1). Their payoffs are *commensurable*, such that the players' utilities are comparable. Alcibiades at the outset of the expedition made this commensurability explicit: "we shall do harm to the Syracusans and so do good to ourselves and allies" (6.18.4-5).<sup>386</sup> The

Chris 30/6/16 14:16

**Comment [3]:** I find the footnote opaque and am not convinced that it addresses Tim's objection. One can impugn error (or hyperbole) to Nikias while accepting that the texts stresses the momentous significance of the battle for both sides.

MDB - I fixed it with your word ok: "Rood calls this "Nikias' misreading", whereas my interpretation supports Nicias' correct assessments of the battle to come. Interestingly, Gylippus distorts the destruction of Syracuse as a loss that is not as great as the loss of all of Sicily compared to a victory for all of Sicily. Sicily as a whole does not stand to lose its fatherland as the Athenians plan to withdraw if victorious, and thus he is able to say that "failure means least pain and success brings most gain" (7.68.3). One can indeed impugn error (or hyperbole) to Nicias while accepting that the text stresses the momentous significance of the sea battle for both sides. The immediate battle is a one on one show down."

<sup>383</sup> Rood 196, on 7.61.1 where Nicias refers to both Athenians and Syracusans as fighting for "fatherland", notes interestingly that this is "A reversal of a usual *topos* that only those invaded are fighting in defence of their country." cf. Aen.Tact.praef.2 Rood calls this "Nikias' misreading", whereas my interpretation supports Nicias' correct assessments of the battle to come. Interestingly, Gylippus distorts the destruction of Syracuse as a loss that is not as great as the loss of all of Sicily compared to a victory for all of Sicily. Sicily as a whole does not stand to lose its fatherland as the Athenians plan to withdraw if victorious, and thus he is able to say that "failure means least pain and success brings most gain" (7.68.3). One can indeed impugn error (or hyperbole) to Nicias while accepting that the text stresses the momentous significance of the sea battle for both sides. The immediate battle is a one on one show down.

<sup>384</sup> CT 3.674; Rood 195-6; cf. 7.64.2.

<sup>385</sup> Also reiterated by the spectators at 7.71.1 and 7.71.3 (ἥδη καλοῦ... τῆς σωτηρίας).

<sup>386</sup> Cf. 7.64.1, 75.7, enslave or be enslaved, and generally of outcomes of war 4.62.3.

Athenians and Syracusans play a **strictly competitive game**, wherein strictly refers to the stakes as being completely diametrically opposed.

Thucydides is attempting to describe the possible outcomes of not just any battle, but of a “beautiful contest”, *καλὸς ὁ ἀγῶν* (7.68.3). The concept of outcome is the main argument, the *καλὸν ἀγώνισμα*, “the wondrous victory prize”, flanks the pivotal element in the catalogue of allies.<sup>387</sup>

### **Strategic Game with Cardinal Payoffs (7.70-71)**

The players in the *The Sea-battle in the Great Harbour* at Syracuse are the Athenians and the Syracusans (with their respective allies): two populations of ships. Player 1 and Player 2 will represent either an Athenian ship or a Syracusan ship. Because of the entanglement, contests are pairwise, even though in reality many are fighting many at the same time. The actions available to both players are a ship’s decision to either **Ram or Back water**, denoted as **R** and **B**, respectively. The two populations or the two players possess cardinal payoffs (i.e. payoffs with commensurable magnitudes). This is only possible in games of pure conflict, where outcomes represent a win or lose result, such as victory or defeat, life or death, here described as an event in which everything “lies in the outcome” (7.71.2).

### **Descriptive Theory (7.70)**

**Players:** 1, 2 (given pairwise contests Player 1 and Player 2 can be either A or S)

**Actions:** A player can Ram or Back water. Set of actions for each player {R, B}

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<sup>387</sup> Connor (1984) 196, notes that the catalogue conveys “the unprecedented disruption (*kinesis*) caused by war.

**Preferences for Player 1:** Player 1 chooses any *action profile* which is an action opposite to that of Player 2, followed by any action profile in which his action is the same as Player 2

**Preferences for Player 2:** Player 2 chooses any *action profile* in which his action is the same as Player 1, followed by any action profile in which he chooses an action opposite to that of Player 1

Player 1's ordering of action profiles:  $(R, B) \sim (B, R) > (B, B) \sim (R, R)$

Player 2's ordering of action profiles:  $(B, B) \sim (R, R) > (R, B) \sim (B, R)$

Since payoffs are cardinal, Player 1's utility can be represented as a function of Player 2's utility. One Player's loss is the other Player's benefit.<sup>388</sup>

$$u_1(\cdot) = -u_2(\cdot)$$

Any outcome (i.e.  $(\cdot)$ ) in which Player 1 wins ( $u_1(\cdot)$ ), Player 2 loses ( $-u_2(\cdot)$ ).

We can represent Player 2's utility function in the same way.

$$u_2(\cdot) = -u_1(\cdot)$$

This is the definition of a **zero-sum game** where all payoffs for any outcome add up to **zero**:

$$u_2(\cdot) + u_1(\cdot) = 0$$

Zero-sum is a type of constant-sum game, which specifies that all outcomes add up to the same number, in this case zero. Games of pure conflict or strictly competitive games are known as zero-sum games, and these terms are interchangeable.<sup>389</sup>

To the narratologist, the presentation in which one player's actions are equal to the opposite result of another player's actions may look familiar to

<sup>388</sup> Connor (1984) 198, "the immense loss" of the Athenians is "the measure of Syracusan victory".

<sup>389</sup> See Haywood (1950, 1954) on modern military decision-making with the zero-sum game in relation to battles; see also Luce, Raiffa (1957) 4.4ff., 7.3.

Algirdas Greimas' actantial model. Greimas posits that the ability to act (power) is a contest that defines the interdependence between two actants as a relationship through negation.<sup>390</sup> Unlike that of Greimas, the algorithmic description developed in this chapter<sup>391</sup> allows not only more than two actants (e.g. players) to interact,<sup>392</sup> but even an  $N$  number to interact simultaneously. His semantic structure, as we have already seen, would have also failed to represent the multiplicity of possible outcomes when the relationship among outcomes is not a strict binary negation, like in our example of dominance. Fortunately, games of pure conflict are analogous to actants with binary relationships through negation.<sup>393</sup> To extend Greimas' terms, we have a model that describes an  $N$  number of actants who interact in contests of strict binary negation. Game theory allows us to further specify that there are two populations that interact as separate undistinguishable multitudes of Player 1 or Player 2 (i.e. *subject* or *object*, in the actantial model). Returning to our description, the *utility function* (= *payoff function*, which orders preferences over outcomes) assigns values to each action profile.

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<sup>390</sup> Greimas ([1966] 1983) X.7, on the actantial category of "Helper" vs. "Opponent", where the first 'facilitates' and the latter 'creates obstacles', one 'acts in the direction of the desire' the other 'the other opposes the realization of the desire'. This category is part of what he called *narrative grammar* and must not to be confused with the three fundamental structural relationships: contrary (e.g. masculine vs. feminine), contradictory (e.g. full vs. empty), and arbitrary (e.g. blond vs. brunette). (xxxii – xxxiv)

<sup>391</sup> Descriptive theory (1) list: Players, Actions, Preferences over outcomes, and (2) extract/apply: Solution concept.

<sup>392</sup> This is not strictly correct, since Greimas allows the sender and receiver to be actants if necessary. The game theoretic framework is by definition freer.

<sup>393</sup> Greimas ([1966] 1983), the ability of the players' to act is called power, or the contest: "The contest appears first as the confrontation of the helper and the opponent, that is to say, the manifestation, at the same time functional, dynamic, and anthropomorphic, of what could be considered as the two terms – positive and negative – of the complex structure of signification. The confrontation is immediately followed by the function "success," which signifies the victory of the helper over the opponent, that is to say, the destruction of the negative term to the profit of a single positive term. The contest, thus interpreted, could well be the mythical representation of the exploding of the complex structure, that is to say, of the metalinguistic operations where the denial of the negative term lets only the positive term of the elementary structure stand." (XI.2.f), esp. (XI.2.d-f).

$$u_1(R, B) = u_1(B, R) = 1$$

$$u_1(R, R) = u_1(B, B) = -1$$

$$u_2(R, B) = u_2(B, R) = -1$$

$$u_2(R, R) = u_2(B, B) = 1$$

Notice how the same outcome (action profile) is positive for one player and negative for the other. Player 1 can be an Athenian ship or a Syracusan ship, because when both players make the same move (R,R) either one may win (if Player 2) or lose (if Player 1). In the same way that if one ship rams and the other effects a backwater maneuver (i.e. R,B), the rammer may win (if Player 1) or may lose (if Player 2). The combined strategies at sea can be completely described by the matrix. (see Table 6)

		PLAYER 2	
		RAM	BACKWATER
PLAYER 1	RAM	( -1, 1 )	( 1, -1 )
	BACKWATER	( 1, -1 )	( -1, 1 )

Table 6

If we analyse this game in terms of dominance, that is, when each player best responds to the other's strategies, we will discover that there is no equilibrium. Neither Player 1 nor Player 2 have a strictly dominant or weakly dominant strategy. (see Table 7)

( -1, 1 )	( 1*, -1 )
↓ ( 1*, -1 )	↑ ( -1, 1 )

( -1, 1* )	( 1, -1 )
← ( 1, -1 )	→ ( -1, 1* )

Table 7: Player 1 best responses, Player 2 best responses

When we combine both Players' best responses, we can see there is no equilibrium in pure strategies. (see Table 8)

( -1, 1* )	↑ ( 1*, -1 )
↓ ( 1*, -1 )	→ ( -1, 1* )

Table 8

The action narrative tries to describe the interaction among ships as undecided, attacking and defending simultaneously. Still, each ship knows its own payoff, since with urgency sailors follow orders, while captains are engaged in a contest of wits, and the soldiers on deck prove their skill. The crew of one ship matches their opponent's crew, all doing their best. Each ship may be player 1, who wins when he takes the opposite action, or player 2, who wins when he takes the same action as his opponent. Each player also knows that everyone else can be player 1 or 2.<sup>394</sup> Like in the *First Invasion of Attica*, this game is modelled as a complete information game,

<sup>394</sup> Two player 1s can never meet, because this would mean that their interests are aligned. An Athenian ship would not fight another Athenian ship. Accidental collisions doubtless occurred. However, Thucydides here does not mention it, unlike he did for the night battle at Epipolae.

by which we mean that players, actions and payoffs are common knowledge.

## Solution Theory (7.71)

ὅσοι δὲ βουλήσονται τῶν τε γενομένων τὸ σαφὲς σκοπεῖν,

To readers “who desire to see what transpired” (1.22.4)<sup>395</sup>

Thucydides wishes the reader to see through the eyes of the historical agents who saw. Thucydides in the spectators' section of the narrative offers internal focalization, and states that the Athenians on land are afraid of the outcome (ύπερ τοῦ μέλλοντος) since everything (πάντων) depended on their fleet (7.71.3).<sup>396</sup> Thucydides' narrative transports the narrator to a vantage point above the battle, so that the *reader sees* the battle and knows the beliefs of the spectators.<sup>397</sup> In space, the narrator is an external focalizer, which takes the narrative form of a bird's-eye view, whereas the spectators are internal focalizers, limited observers.<sup>398</sup> The spectators' beliefs are revealed by their sight, their shouts and ultimately by their swaying bodies. The sea-battle is a *spectacle* (θέα, 7.71.3).<sup>399</sup> Hornblower

<sup>395</sup> Bakker (1997) 37ft.60, see 1.22.4. Cf. 2.48.3 (on the description of the symptoms of the Plague), with the participle, σκοπῶν “observing”, for the activity of readers in the future as in 1.22.4.”

<sup>396</sup> For seeing as *enargeia* (vividness) in this episode of Thucydides, Walker (1993), and for vision and *enargeia* (“the actualization of a certain potentiality”) in later Aristotelian mathematical proof, Lloyd (2012) 415-423, esp. in the contrast between “seeing and thinking” (422-3). This contrast would correspond to Thucydides' narrative action section (70, players thinking) and spectator section (71, visualization), and inversely the reader “sees” the action and “knows” the beliefs of the spectators. Demonstration in Thucydides is the simultaneous articulation of thinking and seeing.

<sup>397</sup> For a slightly different interpretation, Walker (1993) 353-377, for the view that the reader sees what the spectator sees, reads and interprets Polybius', Dionysius of Halicarnassus' and Lucian's methodological statements as analogous to Thucydides' narrative intention here. He does make concessions, quoting Martindale (1993) 7, on the recovery of models through the history of literary receptions who states that “imitations figure significantly in the chain of receptions that make any “originary meaning” of a text irretrievable”. In those historians, who borrow *enargeia* (vividness) from this episode in Thucydides, see in Walker the coincidence of their focus on outcome (*τὰ μέλλonta, pronoia*), *akribēia* (albeit not identical), and the treatment of multiple perspectives, especially as it regards the reduction of multiple contests into one “boxing-match” between two generals in Polybius, and a single view-point in Dionysius.

<sup>398</sup> Rimmon-Kenan (1983) 78-80; Herman (2002) 304ff., 326f., 409ft.5, for the equivalence of the “epistemic stance” of Rimmon-Kenan's external focalization with Genette's zero-focalization which defines “the authorial narrative situation, involving omniscience”; Rood (2004) 115-128, esp. 118; Adams (1995) 67, qtd. in Eidinow (2007) 247ft.49.

<sup>399</sup> Caillois ([1958] 1961) 72ff. esp.22, here agrees with Thucydides that “for non-participants, every *agon* is a *spectacle*”. It is an *agon* with mimicry where “It is not the athletes who mimic, but the spectator.”

writes that this episode shows that both “athletic as well as theatrical spectatorship is here invoked, … as also is the Homeric τειχοσκοπία, ‘watching from the walls’”.<sup>400</sup> Thucydides employs a unique method to describe the probability that either side holds of winning or losing.<sup>401</sup> Viewers calculate collectively and unknowingly the outcome of the battle.

Thucydides contrasts the close imitation in preparedness before battle (ἀντιναυπηγῆσαι, 7.62.3, ἀντιμιμήσις, 7.67.2)<sup>402</sup> of the opposing fleets with the stark differences in beliefs on shore (διαφόρως, 7.71.6) during battle. The different beliefs of the spectators on land imitate the experiences of those at sea (παραπλήσια… ἔπασχον, 71.5). This is an example of descriptive *mimesis*.<sup>403</sup> The actions at sea are observed and mimicked by the beliefs of the spectators on shore. Thucydides guides us through as to how this epistemic view is accomplished. Of the Athenians, Nicias led (ῆγε) the infantry to the sea and ordered them into a line (τὸν πεζὸν τὴν θάλασσαν παρέταξεν ὡς ἐπὶ πλεῖστον, 7.69.3). Of the Syracusans, the troops positioned themselves also on shore (ὁ πεζὸς ἅμα αὐτοῖς παρεβοήθει, 7.70.1) in the same way as the Athenians. The infantry on shore on both sides (οὐ τε ἐκ τῆς γῆς πεζὸς ἀμφοτέρον, 7.71.1) have a necessarily uneven range of view, on account of the uneven sea-battle (διὰ τὸ <ἀνώμαλον> τῆς ναυμαχίας ἀνώμαλον καὶ τὴν ἔποψιν ἐκ τῆς γῆς ἡναγκάζοντο ἔχειν, 7.71.2-3). Given the proximity of the battle to shore (δι’ ὀλίγου γὰρ οὕσης τῆς θέας (proximity to the spectacle, 7.70.3), some saw their own winning while others saw their own weaker (εἰ μὲν τινες ἴδοιεν πη τοὺς σφετέρους ἐπικρατοῦντας… οἱ δ’ ἐπὶ τὸ ἡσσώμενον βλέψαντες, 7.71.3).<sup>404</sup>

<sup>400</sup> Hornblower (2004) 342-6; (2008) 694.

<sup>401</sup> Eidinow (2007) 247ft.49, the technique of “an imaginary vantage point above the dance floor”.

<sup>402</sup> Allison (1997a) 45-50, 54.

<sup>403</sup> Walker (1993) 355ff. esp. 358-9.

<sup>404</sup> Thucydides typical use of *variatio*, instead of winning-losing or stronger-weaker, he employs winning-weaker, as stronger-losing, which are all equivalent. This technique also imparts more information than the simple binary relation, such that winning = stronger and losing = weaker.

By equating “seeing” as selection on shore with the uneven strategy selection at sea, the collective opinion is necessarily uneven as well. The contests out at sea are uneven because they are subject to a selection pressure. High density implies a high frequency of encounters that determines the uneven matching process. The plethora of ships restricted to a limited area creates ‘a press’ (*ochlon*).<sup>405</sup> On the virtues of theoretical biology’s perception of random strategies or mixing, Colin Camerer notes that: “selection pressures guide a population toward an equilibrium mixture.”<sup>406</sup> A random equilibrium mixture, the incalculable (*paralogos*), is what Thucydides’ understood as chance (*tuche*) from the human point of view (Cf. 8.24.4).<sup>407</sup> *Paralogos* is outside calculation, neither subject to words or reason.<sup>408</sup>

We can see that the description of the outcome, as it pertains to *tuche*, requires a multiply internally focalized epistemic condition (knowledge) so that heuristic conditions (problem-solving) are satisfied, and thus the outcome revealed. The eyes (τῆς ὄψεως) are required for judgment (τὴν γνώμην) and therefore knowledge of the spectators’ beliefs mimics the action of the players at sea (ἀπὸ τῶν δρωμένων... τῶν ἐν τῷ ἔργῳ... , 7.71.3, 5). Line of sight fixes the distance of the spectators on land from the spectacle, which is close in front of them (δι’ ὀλίγου, 7.71.3). Here Thucydides creates symmetry of judgment through their equidistant visibility,<sup>409</sup> and then extends the parallel to describe the outcome of the contest as an accurate *statistic*. Spectators collectively become symmetrically accurate judges of the action.<sup>410</sup> Thucydides promises

<sup>405</sup> Smith (1886) 7.62.1 ad loc. for the translation of *ochlon* as ‘press’, as in density rather than number.

<sup>406</sup> Camerer (2003) 120; for a review of the numerous interpretations of a mixed strategy, see Osborne, Rubinstein (1994) 37-44; Rubinstein (1991) on the difficulties.

<sup>407</sup> Game theory traditionally sees the calculation of a probability as “calculable” as opposed to Thucydides “incalculable” *paralogos*, this is a cultural perception of probability; for *paralogos* and the concept of *agon*: CT 3.820-21, on the association of uncertainty in human affairs with the agonistic verb σφάλλω, “to trip up [in wrestling]”, cf. 7.62.1, 8.24.5.

<sup>408</sup> Allison (1997a) 66; Hunter (1973) 51.

<sup>409</sup> *Isocephaly* in art (heads at the same height, e.g. Parthenon frieze) is a concrete example of the Ancient Greek obsession with symmetry.

<sup>410</sup> Savage ([1954] 1972) 172-3, for the analogy of a jury whose members have a common value judgment, and whose judgments may differ because they have “different systems of personal probability” i.e. “Personalistic views hold that probability measures the confidence

*akribēia* (accuracy/ precision, 1.22.2) “in his analysis of *erga*, ‘deeds’” and delivers it - through the statement of premises connected by a logical structure.<sup>411</sup> Thucydides was the first prose writer to make *akribēia* the core principle of historiography.

Thus Thucydides abstracts three groups in the population, which we can substitute for points on a line. We hear nothing of gradients. If the battle is balanced, even though some are winning and some are losing, the perspective of those on land who cannot decide whether they are winning or losing must be at the ‘centre’, or in the middle, by analogy. While some saw victory and others saw defeat, one unique group of spectators gazes at a single point of interaction (ἄλλοι δὲ καὶ πρὸς ἀντίπαλον τί, lit. “at a wrestling point”) of the sea battle.<sup>412</sup> On account of their inability to judge the mixture of the conflict their bodies swayed equal to their opinion drawing a line through their difficult judgment (see Figure H).<sup>413</sup>



**Figure H: winning, indifferent, losing**

The expectation of defeat and victory where everything is in the balance indicates that Thucydides attempts to describe an outcome as a point between losing everything and winning everything. The point between everything and nothing is half of everything on the balance for one navy and

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that a particular individual has in the truth of a particular proposition”, p.3; see 172-183, the following arguments are similar to the formulation of Savage’s zero-sum game as a multipersonal statistical problem based on a theory of *personal probability* (27ff.). The solution produced is reminiscent of the group minimax rule where equidistant visibility ensures a common utility function.

<sup>411</sup> Crane (1996) 65, “Thucydides *akribēia* does not reside in the evidence, ... Thucydides creates *akribēia* out of his evidence”; *Akribēia* is not only “the detailed description of particulars that ensures historical accuracy” but also “tragic universalism”, see Rosalind Thomas (2011) 233-4. *Akribēia* is the manipulation of the particulars to create universality. She concludes, whilst borrowing a phrase coined by Simon Hornblower (1987) 35-34, that Thucydides’ type of proof is through ““tragic *akribēia*”, “tragic accuracy or precision””.

<sup>412</sup> In Homer, the critical point is a vulnerable place in the body that determines death. Odysseus in the *Iliad* 11.439 knows that the arrow has not struck a critical point (**τι** βέλος κατὰ καρίον ἤλθεν). The indefinite article identifies the exact point, see Trédé (1992) 29.

<sup>413</sup> Rood 71f. for other instances where “perceptions explain decisions” in Thucydides and other contemporary authors.

half of everything on the balance for the other, by which “the balanced sea battle was established” (ἰσσορόπου τῆς ναυμαχίας καθεστηκίας, see Aesch. *Pers.* 346, for ‘balance’ of a weighted scale). The uncertainty represented by this group of spectators is chance. In Gylippus’ exhortation speech, chance (τύχην ἀνδρῶν, lit. the chance of men)<sup>414</sup> is a consequence of disorder (πρός ἀταξίαν) and thus he fixes the form of prediction before the sea battle even begins. (7.68.1) The “nearly equal sea-battle” (ἀγχώμαλα ἐναυμάχουν, 7.71.4) is converted into mixed beliefs that collectively predict that the outcome will be a result of chance. The outcome was beyond human control. The Athenians had no hope of survival unless “something incalculable” happened (τι παρὰ λόγον, 7.71.7).<sup>415</sup>

### Mixed Strategy

( -1 )	( 1 )
( 1 )	( -1 )

Table 9

Since the payoffs satisfy,

$$u_1(\cdot) + u_2(\cdot) = 0,$$

we can restrict our attention to one function (see Table 9):

$$u_1 = u \text{ with } u_2 = -u.$$

The payoff function represents the *payment* of player 2 to player 1. The act of payment is a strategy in which 2 loses its fatherland to 1. The reaction to

<sup>414</sup> This is a unique personification of Chance. Cf. Dem.11. 22, τὴν τῆς ἡμετέρας πόλεως τύχην ἀν ἐλοίμνη ἢ τὴν ἐκείνου.”

<sup>415</sup> See 7.55, Pouncey (1988).

this is that 2 will attempt to minimize its payment and 1 will try to maximize 2's payment. This is best exemplified in the thematic use of *soteria*, translated as salvation, preservation or safety, in this episode. *Soteria* was a buzzword in political discourse during most of the Peloponnesian war.<sup>416</sup> The theme in the narrative is particularly noticeable as a result of its absence elsewhere in the *History*,<sup>417</sup> and that only here does it refer also to the Athenians. Allison interprets the meaning of *soteria* as - "a last resort".<sup>418</sup> The Athenians are attempting to preserve their fatherland from destruction, whereas the Syracusans are attempting to acquire at least the Athenian 'metaphorical' fatherland. Both approach their payoffs as dependent on security: Nicias himself says that the sea battle is a contest (*agon*) for *soteria* (7.61.1):

ὁ μὲν ἄγων ὁ μέλλων ὁμοίως κοινὸς ἄπασιν ἔσται περί<sup>τε</sup> σωτηρίας καὶ πατρίδος ἐκάστοις οὐχ ἥσσον ἢ τοῖς πολεμίοις·

The coming contest will have the same importance for everyone. We shall be fighting for salvation and for fatherland, just as much as the enemy.

In the narrative of the battle, the Syracusans seek to increase (*auxesis*) **no less than *soteria*** by preventing their escape, and the Athenians seek **no more than *soteria*** by avoiding destruction.<sup>419</sup> We realize that opponents

<sup>416</sup> Bieler (1951) for *soteria* as an oligarchic "slogan"; for *soteria* as security of the city, see Edmunds (1996) 142-8, "The *soteria* of a city ... was a theme of Athenian politics and public discourse from 413"; see also Rhodes (1972) 231-5 for inscriptions; Raaflaub (1992) 32ft.79; Seaford (2010) (2009).

<sup>417</sup> Allison (1997a) 54ff.; Bosworth (1993) 34 ft.24, on the prominence of the term in the Melian dialogue, the Athenians insist that the Melians think of *soteria* - "the preservation of their city" 5.91.2, and that surrender would guarantee their survival. Used albeit in a different context, which is bargaining (to offer) since players are not equal (5.101). Allison considers the interaction to be "paradoxical" (57) we will see this is not the case.

<sup>418</sup> Allison (1997a) 56.

<sup>419</sup> Allison (1997a) 58, for *soteria* defined as the old Periclean notion of *aspaleia* or "preservation of what guarantees safety" at 6.83.2 (CT 3 ad loc. 6.23-4), or succinctly, the commonweal (*to koinon tes soterias*, 2.60.4, 2.61.4) – "the safety of the citizens is the equivalent of the preservation of the state" (p.60); *Soteria* is a minimum level of security for any city-state, which we see expressed in Thucydides - the Athenians lost hope of being saved when they had no ships, no crews and no money in the treasury (8.1.2), Security features in a variety of sources at the time. For *soteria* and money: the association of the appointment of probouloī to manage the state (8.1.3) see Arist.Lys., in Lysistrata's discussion with the Proboulos (476-613) wherein the *soteria* of the city depends on money (496-501, *soteria* of Greece 29-30), also Arist.Pi.184-5, Arist.Ath.Pol. 29.4 on probouloī and

with diametrically opposed interests seek to guarantee a *security level*.<sup>420</sup>

*Soteria* is the minimum security of the city, here the land army, if the navy is lost.<sup>421</sup>

The notion of security in two-player zero-sum games is a “natural benchmark”.<sup>422</sup> To ensure no less than their preservation is called a *maximin* strategy, whereas to ensure no more than their preservation from destruction is called a *minimax* strategy.<sup>423</sup> The Syracusans maximize by increasing their minimum payoff of security (maximum of all minima). The Athenians minimize the destruction of their security from their maximum payoff of fatherland (minimum of all maxima). We can now see that the *Nash equilibrium* is an expression of *stability*, whereas the *maximin strategies* contain a notion of *security*. Both in a primitive form are operative in the *History*. The property of stability is the assumption that Archidamos had expected results, such that each player did not have any incentive to deviate from the expected solution. This is an elemental feature of “any conceivable theory predicting the results of a game”.<sup>424</sup>

## Sight and Judgment

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*soteria*; In Thucydides, war depends on money for Hermocrates (6.34.2), Pericles (2.13, with intelligence; 1.142, reserves of money) and Archidamos (1.83); money then becomes a prominent theme in book 8 (8.46; 8.53.2, 54.1, *soteria* only with Persian support).

<sup>420</sup> Game theoretic terminology, “security level” for the notion of caution.

<sup>421</sup> Rhodes (1972) 232-35, for Isaeus V. *Her.Dic.*37 for σωτηρία τῆς πόλεως; Aris. *Eccl.*394-402, Thuc. 8.67.2 and Arist. *Ath.Pol.*29.2, 4 on περὶ (τῆς) σωτηρίας “as a recognized formula” referring to “the general good of the state”, specifically the “safety of the city”, to which should be added Thuc. 8.53.2 σωτηρία τῇ πόλει, for Peisander speaking against objections to Alcibiades’ recall, insuring Persian financial support to carry on the war, and thus the “safety of the city”; CT 3.694, for the similarity with Pylos in book 4 “the disastrous consequences entailed for a land army by the defeat of the fleet (the thought is Aeschylean, cf. Atossa at *Persians* 728 ...)”

<sup>422</sup> Maschler, Solan, Zamir (2013) 110ff., “a natural benchmark for each player is his “security level”: what he can guarantee for himself based solely on his own efforts, without relying on the behavior of other players.” von Neumann proved the Minimax Theorem in 1928, and is the basis of the theory expounded by himself and Morgenstern in the 1944 *Theory of Games and Economic Behavior*, see von Neumann (1953), “there could be no theory of games on these bases without the theorem”. Luce, Raiffa ([1957] 1985) Appendix 3, also see 5.6 for the difficulties in attempting to describe games as purely descriptive. Also Appendix 2 for a formal presentation of the minimax theorem and excellent historical remarks on the several proofs.

<sup>423</sup> Maxmin and minimax correspond to lower and upper envelopes, respectively, see Maschler, Solan, Zamir (2013) 153-4.

<sup>424</sup> Maschler, Solan, Zamir (2013) 101.

The spectator section first and foremost conveys uncertainty to the reader. Combining the principle of *maxmin strategies* at sea with the uncertainty on shore, we can say that there is a probability distribution over outcomes. The uncertainty is presented focalized 'formally' by the Athenian army. There is some probability distribution over the collective Athenian navy's set of strategies. This translates as some proportion of Athenian ships playing the strategy Ram, and the rest playing the strategy Back water. Symmetrically, the same is true of the Syracusan ships. The exact proportions are revealed through the collective vision of those on shore. Now let us look at the spectator section in more detail.

To see is to judge, but not to affect. Sight is an accurate measure of judgment in several ancient writers.<sup>425</sup> Thucydides frames this section by equating the *agon* of judgment with the *agon* of action. In chiastic construction (ABB'A') he defines (A) "the infantry on land", (B) "the balanced battle" (B') "the *agon*" (A') "the conflict of mind" (7.71.4).

ὅ τε ἐκ τῆς γῆς πεζὸς ἀμφοτέρον ἴσορρόπου τῆς ναυμαχίας καθεστηκούσας πολὺν τὸν ἀγώνα καὶ ξύστασιν τῆς γνώμης εἶχε

The infantry on land on both sides, while the balanced sea-battle had been established, and there was much contest and stasis of the mind.

Donald Lateiner on a final note regarding the use of mimetic syntax (e.g. *incipere* at the beginning, or *ripa* at verse-end, or *mediol dividire* at mid-verse) writes that it is in *chiasmus* that "the idea of reciprocity and distribution is expressed in the word order".<sup>426</sup> Thucydides will not explain

<sup>425</sup> On the Pre-Socratics and Hippocratics see Shanske (2007) 33-6; Snell (1924) 33, 35, *gnome* is "the result of recognition" (*erkennen*); For sight compared to hearing, eyes are more trustworthy than ears: Thales (Stobaeus, *Florileg.* 3.12.14) was asked how far is a lie from the truth, and he replied "as much as eyes from ears" Heraclitus (Polybius 12.27), eyes are more accurate (*ἀκριβέστεροι*) witnesses than ears; Herodotus (1.8), eyes are more trustworthy (*ἀπιστότερα*) than ears. "The steadfast claim of reliance on their eyes and ears remained from start to finish the chosen 'methodology' for historical inquiry." Marincola (1997) 66, esp.63ff, see also Glebkin (2012).

<sup>426</sup> Lateiner (1990) 218, also 209ff., esp. 205, mimetic syntax comes from Homer *Il.*11.593-98 describing Sisyphus, the words on his way up are rough and long, whilst on the way down short and open.

the distribution through any sort of arithmetic. Numerals in the *History* are used rhetorically for effect rather than for calculation.<sup>427</sup> He was no geometer, but an enthusiast most certainly. He is often given little credit for his efforts in geometry,<sup>428</sup> and historians of mathematics forget Thucydides' firm grasp of astronomy.<sup>429</sup>

A simple diagrammatic view of the description of the sea battle will show that all the spectators on land collectively possessed a partial view of the whole battle. They were lined up on the beach. The centre of the *melee* and those ships facing the mouth of the harbour could not have been seen by anyone on land, unless they were looking down onto the battle from a distance (See Figure I).<sup>430</sup>

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<sup>427</sup> Rubincam (1979); Hanson (1992) for a view of Thuc.'s attempt at calculation; Hornblower (1994) 152 and ft.58, on these examples and also on the 2000 talents in siege contexts (2.70, 7.48) as "conventional, but then seems about right" given  $ML\ 55 = Fornara\ 113$ .

<sup>428</sup> Netz (1999) 308, "there is not the slightest hint in his work that anything like mathematics was at all known to him". Referring to Thuc.'s rough estimates of perimeter (e.g. circumference of Sicily sailing days, 6.1). These are harsh deterministic words. Doxiadis (2012) has shown similar structural characteristics between Thucydides and Euclid, especially with regard to demonstration.

<sup>429</sup> Netz (1999) 307ff., who notes that early mathematicians were accomplished astronomers, notably Eudoxus, "interested, after all, in *chronology*". Eudoxus was also a doctor (Diogenes Laertius 8.88). *HCT* vol. 3, Appendix on Thucydides' "summers and winters" 699-715, on Thucydides' mastery of astronomy.

<sup>430</sup> This recalls Homeric *teichoskopia*, watching battles from atop the walls of Troy in the *Iliad*, or the gods watching human action from atop the peaks of Olympus *Il.* 4.4, 8.51-2, 22.166, Pindar *OI.*1.54; Herodotus has the Persian king sit at the base of a mountain at a distance to watch the sea battle at Salamis between the Greek and Persian fleets (8.87.1, 90.4), Allison (1997b), *CT* 3 ad loc.

## GREAT HARBOUR AT SYRACUSE

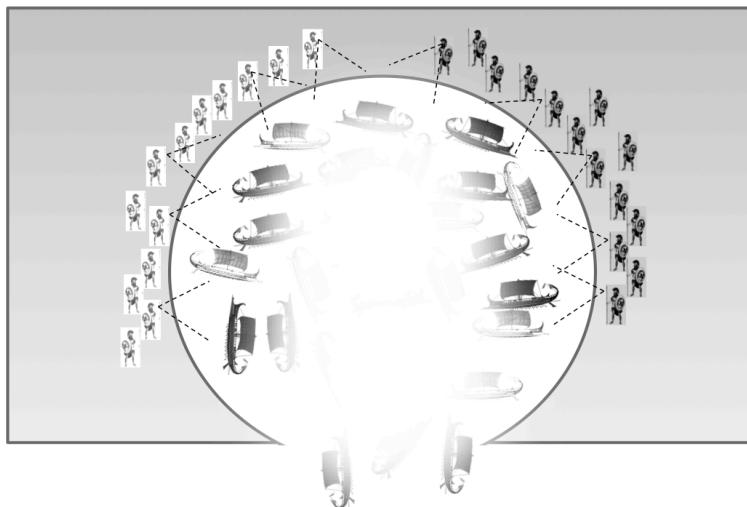


Figure I

The deconstruction of the narrative in terms of cognition is what Netz calls the study of “cognitive history”.<sup>431</sup> Plato in the *Gorgias* has Socrates say, “You’ve failed to notice how much power geometrical equality has among gods and men, and this neglect of geometry (*geometrias gar ameileis*) has led you to believe that one should try to gain a disproportionate share of things” (508a). This sentiment is operative here. The bird’s-eye or god’s-eye view of the action at sea is equated to the partial view of all the spectators on shore. Thucydides’ strict geometric equality is wrong,<sup>432</sup> since the historian equates the god’s-eye view with the point of view of the collective.

The battle was uneven and so were the spectators’ points of view (διὰ τὸ <ἀνώμαλον> τῆς ναυμαχίας ἀνώμαλον καὶ τὴν ἐποψιν ἐκ τῆς γῆς

<sup>431</sup> Netz (1999) 7, for cognitive history as “the practices of knowledge”; also see (2009) 174-241, for the intersect of poetry and geometry in the Hellenistic period as a tradition that comes from Homer, also present and copied from Herodotus. “Since Plato himself – it has been something of a commonplace to discuss the “beauty” of certain scientific objects (possessing symmetry, balance, simplicity, etc.)” (xiv).

<sup>432</sup> Heath (1921) 17-18, “optics depend on geometry” as it is expounded in Aristotle’s *Posterior Analytics*. The combination of sight and distance are a mathematical discovery (see Euclid’s *Optics*).

ήναγκάζοντο ἔχειν, 71.2-3). Of the three groups of spectators, some saw victory others defeat, but one group looked at a wrestling point, where there was a “continuous uncertainty over the contest” (διὰ τὸ ἀκρίτως ξυνεχὲς τῆς ἀμίλλης). The notion of repeated evaluation, such as “counting several times”,<sup>433</sup> is perhaps exploited in his use of the term ξυνεχές, “continuous”.<sup>434</sup> The result is that their judgment is equal to the movement of their bodies (τοῖς σώμασιν αὐτοῖς ἵσα τῇ δόξῃ)<sup>435</sup> that mimic the action at sea. Thucydides finds a “true figure” through an “estimated measurement”. One focalized group of spectators judged that at “any moment throughout they were either on the point of escape or on the point of destruction” (αἰεὶ γὰρ παρ' ὄλιγον ἡ διέφευγον ἡ ἀπώλλυντο). This section (70.1-4) is framed, perhaps most importantly, by the focalisation of the external narrator that “the sea battle hung in the balance... as long as the sea battle remained in the balance” (ἰσορρόπου τῆς ναυμαχίας καθεστηκίας... ἔως ἀγχώμαλα ἐναυμάχουν).<sup>436</sup> The authorial fact that there was balance frames the narrative of the event.

The three groups of spectators so far included both Athenians and Syracusans. Thucydides goes on to reflect on the division among the Athenians alone. The rhetorical chiasmus is repeated again with greater poetic vigor as the sound of the voices of the Athenian soldiers on land in unison (7.71.4).

Πάντα ὁμοῦ ἀκοῦσαι, όλοφυρμὸς βοή, νικῶντες κρατοῦμενοι

all together was heard

(A) lamenting, (B) cheering, (B) “we are winning”, (A) “we are losing”

<sup>433</sup> For a parallel of collective accuracy see 3.20.3-21.1 on calculating the height of a ladder at Plataea.

<sup>434</sup> see CT, term used elsewhere 7.27.4 and 5 for “repetition” of inflicting damage, also for the thematic “unremitting harassment” there and 7.78.3 (ad loc.); for counting days (time) 7.81, and of speech 5.85.

<sup>435</sup> See L&S for ἴσος, η, ον cum dativo.

<sup>436</sup> Cf. Aesch. *Per.* 386-430, esp. 399-405, on the battle of Salamis, parallels this description focusing on balance and chance, “some god weighed the scale with unequal chance” (οὐκ ἰσορρόπω τύχη) in favour of the Athenians.

Now let us combine the concept of zero-sum with estimation as an expectation. As this is a zero-sum game, the opponent will seek to minimize your payoff, which is equivalent to maximizing his own payoff. This is described in game theory as a *pessimistic belief*. There is also a collective perspective over an unknown-unspecified number of events (i.e. multiple one on one interactions, called trials) happening simultaneously. The collective perspective is equivalent to a statistical expectation of the outcome (= expected payoff). The proportion of the collective perspective that maximizes each ship's expected payoff is called a **mixed strategy**. Because of each ship's pessimistic beliefs, the collective perspective seeks to find the level of caution (*soteria*) that determines the mixed strategy.

We shall see that **standard theory** produces the same result as Thucydides' method. Game theory calculates **expected payoffs** (*EU*) as a weighted sum of a player's payoffs. **The proportion  $p$  is some fraction or percentage bound between 0 and 1.**<sup>437</sup>

1. Player 1's expected payoff if Player 2 chooses to Ram:

$$\begin{aligned} EU(\cdot, R) &= p(-1) + (1 - p)(1) \\ &= 1 - 2p \end{aligned}$$

2. Player 1's expected payoff if Player 2 chooses to Back water:

$$\begin{aligned} EU(\cdot, B) &= p(1) + (1 - p)(-1) \\ &= 2p - 1 \end{aligned}$$

Player 1's expected payoffs on the y-axis can be plotted for all feasible values of  $p$  on the x-axis. (See Figure J)

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<sup>437</sup> The arithmetic method was formulated by Williams (1966) in his *Compleat Strategyst*.

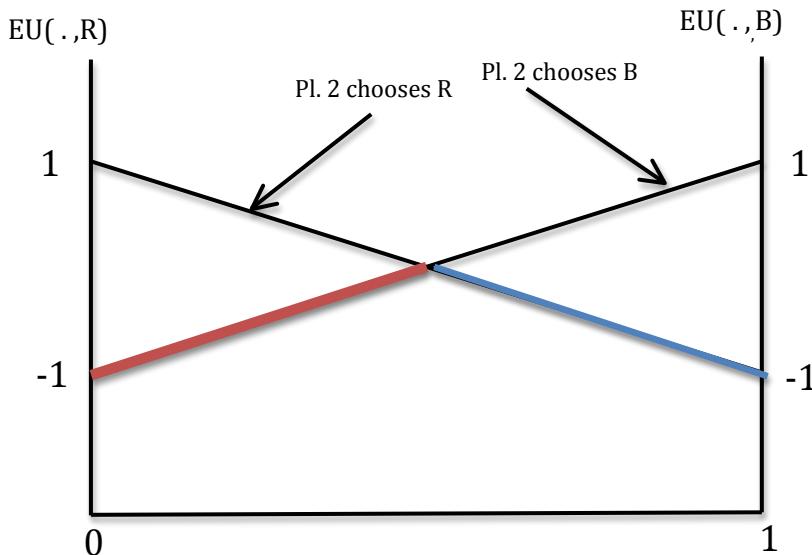


Figure J

Assume one ship interacts over several trials. **When  $p = 0$ , Player 1 only backs waters. When  $p = 1$ , Player 1 only rams.**  $P$  represents the frequency with which a ship rams. When Player 1 only back waters, Player 2 will anticipate and win by backing water (matching). When Player 1 only rams, Player 2 will anticipate and win by ramming (matching). Selecting a proportion at random, say  $p = \frac{1}{4}$ , we can say that when the collective perspective sees Player 1 ramming  $\frac{1}{4}$  of the time, Player 2 will minimize Player 1's payoff by choosing to back water. Since 1 is backing water  $\frac{3}{4}$  of the time, 2 chooses to back water since he has a higher chance of matching. (Red Line) Now say, the collective perspective sees Player 1 ramming  $\frac{3}{4}$  of the time, Player 2 will minimize Player 1's payoff by choosing ram (Blue Line). This *pessimistic* behavior is represented graphically. (Together the Red and Blue Lines are referred to as the *lower envelope*.)

There is a clear maximum for Player 1, and it occurs where the two lines intersect. The interpretation of this point is that caution leads Player 1 to maximize his minimum (pessimistic) expected payoff. Given that the action in the field is uneven, the disparity of beliefs is balanced on the aggregate. It

is now necessary to reintroduce into the model the interaction that 1 and 2 have as a one on one contest between unknown ships.

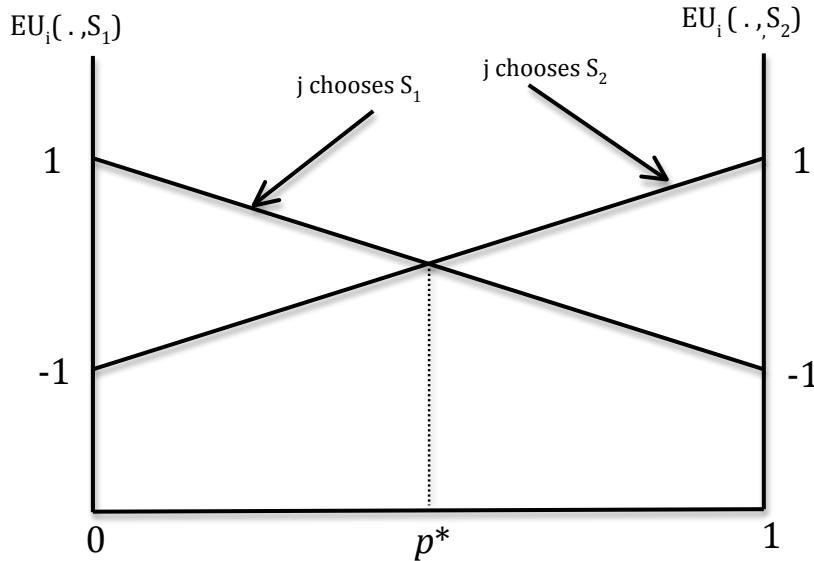


Figure K

This graphical representation allows to stand in for Player 1 or Player 2, as long as  $j \neq i$ . Whatever is the number of Player  $i$ , the other Player is  $j$ . We now can fix all  $i$ 's as the Syracusans and all  $j$ 's as the Athenians. The Syracusans are a group of ships of Players 1 and 2. The same holds for the Athenians. We also substitute R and B for  $S_i$  and  $S_2$ , so that  $S_1$  stands in for R or B, just as  $S_2$ . From the collective perspective of the Athenians alone, we know that there were two opposing views which were balanced by another group looking at a single point where the action was balanced. The description of the points of view implies a linear spectrum running from win to lose, which again is an elementary statistical fiction which groups all those who see victory at one end and all those who see defeat at other end, divided by indecision or indifference. The game theoretic solution for this environment, assuming there is indifference, is to equate the expectations of  $i$  given  $j$  chooses  $S_1$  with the expectations of  $i$  given  $j$  chooses  $S_2$ .

$$EU_i(\cdot, S_1) = EU_i(\cdot, S_2)$$

From our previous results:

$$1 - 2p = 2p - 1$$

$$p = \frac{1}{2}$$

Algebraically, we can calculate the *maximin* strategy of one Athenian ship. Through symmetry the calculation yields the *maximin strategies* of both players. As the sea battle hung in the balance, both sides were equally likely to win or lose. Whereas standard game theory interprets mixed strategies as an environment in which players intentionally act unpredictably to improve their chances of success,<sup>438</sup> Thucydides' collective perspective approach is used solely to predict the likelihood of an outcome. Players are not directly involved in the randomizing process. Even though exhortations at sea and the combatants' reaction to the spectators' shouts on shore may have influenced the ships' countermaneuvering, this is not made explicit.<sup>439</sup> Eidinow argues that Thucydides, "the methodical historian, can analyze and explain the unexpected, revealing, for example, that chance events originate in men's passions rather than imposing themselves from outside".<sup>440</sup>

N.B.: At first, there is no uncertainty in the crews' actions on board, and all are following orders. Further down in the narrative, however, communication breaks down and we are told that the crews could not hear the technical orders over the din of so many ships crashing into one another.<sup>441</sup> *In this case, one could also describe the interaction as a single player indifferent as to ramming or backing water because he does not know which player he*

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<sup>438</sup> Herodotus' description of the sea battle at Salamis has Artemisia, in one scenario, ram another ship randomly (*κατὰ τύχην*) to increase her odds of saving her life. (8.87-88).

<sup>439</sup> Spectator influences battle see CT 3 ad loc 7.71; Hacker 7.71.24.

<sup>440</sup> Eidinow (2011) 121; Hornblower (2004) 345ft.50 on the effect the spectators at sporting competitions have upon the morale and therefore performance of the players. He importantly notes that "the experiences of those on board the ships paralleled those of the spectators" and that as a result "the influence was two-way, spectators affecting the action as well as the action affecting the spectator"

<sup>441</sup> Auditory deprivation connects the night attack on Epipolae (7.42-46, 44.4) with the sea battle, whose emphasis is odd here 7.70.6, much like the emphasis on "narrowness" is odd at Epipolae 7.44.2 as opposed to here, see CT 3 ad loc.

is, 1 or 2. Through symmetry, all other players think likewise. Thucydides' description of uncertainty as an endogenous collective indifference through mixing can also be interpreted as an exogenous random variable (created by the board of the game) which would make this complete information game into an incomplete information game. Harsanyi's solution (1973) suggests that players model a game of incomplete information as a game of imperfect information, which would require a *common prior assumption* of the distribution of 1's and 2's (types). This is neither provided nor implied by the text. The strategic interaction here shares traits with Rosenthal's interpretation (1979), especially given that one ship ramming as player 1, could have lost as player 2 by backing water from another – e.g. action profile (R,B) - making this interaction sequential. Simultaneity is nonetheless preferred by classical scholars. I address incomplete information and dynamics in other chapters.

### The Diagnosis of a Worthy Contest

The sea battle in two separate authorial interventions is called a “worthy contest”, ἄξιος ὁ ἀγών (7.56.3), and the Syracusans call it a “beautiful contest”, καλὸς ὁ ἀγών (7.66.1; 7.68.3).<sup>442</sup> Thucydides' narrative of the sea battle in the great harbour at Syracuse is narrated in bird's-eye-view. The narrator reveals both the calculation of the viewers on land and the actions of the participants at sea (7.70-71). Thucydides' description culminates with Thucydides' own solution concept, which is a prediction through “collective wisdom”:<sup>443</sup> a sentiment very much in line with Pericles' and Hermocrates' defence of democracy.<sup>444</sup> But this is an *agon* characterised by a collective wisdom resulting from a stasis of judgment (ξύστασιν τῆς γνώμης, 7.71.1). In a “direct personal opinion”<sup>445</sup> in the Corcyrean stasis, Thucydides defines intelligence as the “ability to understand a question from all sides”, καὶ τὸ πρὸς ἄπαν ξυνετὸν (3.82.4). The use of the term *xunesis*, intelligence, is

<sup>442</sup> Hornblower (2004) 336-342. a common epigraph on vases with athletic and myth depictions, 278-281, x *kalos* y.

<sup>443</sup> Hyndman et al. (2011).

<sup>444</sup> 2.40.2 and 6.39.1, for the many as the best judges.

<sup>445</sup> CT 2. 478.

relevant. Intelligence is the ability to see “the whole”, πρὸς ἄπαν, or a single event from all perspectives. Thucydides’ reconstruction of the sea battle is a form of implicit self-praise.<sup>446</sup> The narrator sees all from all sides, both collective beliefs and actions.<sup>447</sup> The description of collective beliefs are Thucydides’ way of describing risk and indicates, according to this reading, that there is no predictable advantage to either player.

This episode is the most sophisticated logical-rhetorical presentation, perhaps of the entire *History*. It leads the reader from the theme of numbers in the population, and spatial constraints, to the *agon* itself. The players are neither the generals (*strategoi*) nor the numerous captains (*treirarchoi*), but the ships. The process to reach the *agonismos* is through a form of medical *krasis*, a mixing.<sup>448</sup> The “balanced mixture” is the solution which we can also gage from Alcibiades’ insistence on mixture (ξυγκραθέν, 6.18.6) of high, low and middle (τὸ μέσον) instead of just the young and old, and Thucydides’ own authorial comment of the “moderate blending” (μετρία... ξύγκρασις ἐγένετο, 8.97.2) between the few and the many as the “good constitutional arrangement” of the Five Thousand.<sup>449</sup> Physical forces and necessity, ρύμη<sup>450</sup> and ἀνάγκη, compel both fleets to knit together. The more mixed the opponents become, the closer we get to the process of balancing.

The motif-of-three of the spectators serves as a diagnostic procedure to discover the outcome, falling short of prognostication since the narrator’s prediction coincides with the revelation of the outcome. Still, note that Thucydides’ description of the “type” of battle (οἵα) to limit the actions, his

<sup>446</sup> There are 11 instances of the term, two in the stasis episode (at 3.82-83), see Ostwald (1988) 59 on τὸ πρὸς ἄπαν ξυνετὸν as “intelligence in all action” and as something Thucydides “regards as desirable”. The inverse of intelligence is perceived as “totally unfit for action”, ἐπὶ πᾶν ἀργόν.

<sup>447</sup> Finley (1967) 142. on the underlying meaning of *paralogos* as “felt by all who (unlike Pericles and the historian himself) were unable to estimate”, also 144.

<sup>448</sup> de Romilly (1976) 93-105; Connor (1984) 229, 170; CT 3.352, 1035 esp. Athenagoras’ speech and the related discussion of *isonomia*, “equality” and the many are best able to judge 6.35-40.1 ad loc.

<sup>449</sup> Rechenauer (1991) 298-303, for mixture as medical, see esp. *On Ancient Medicine* 13 and *Regimen* 2.56.

<sup>450</sup> See ρύμη ἐμπίπτειν at 2.76, force, rush, swing of a body in motion, also of the noise made of a boat in motion, Arist. *HA* 533b19.

attention to the moment “whenever” (όπότε) ship fell on ship, elsewhere as a dramatic time for action - “now or never!” (εἰ ποτε καὶ αὐθις), and the crowning solution revealed by the beliefs of the spectators who see “some particular part” (πη)<sup>451</sup> where their own win or lose or are balanced. This diagnostic is reminiscent of the medical writer of *On Joints* (58.48):

ὅπη ἔκαστον, καὶ οἵως, καὶ ὅπότε τελευτήσει  
what way, what sort, and when every case will terminate

The episode follows the medical/*historia* structure answering some combination of what type, where, when, and in what manner. As the *agon* enters the stage of a turning-point, the *agonismos* emerges and with it the “prediction” of outcome. The balance *isorropou* is established through the mixture of two homogeneous populations of ships in an interaction of pure conflict. The actions are mimicked by the beliefs of the spectators on shore (*diaphorai*). The balance is sustained for a long time, at which at some point unspecified in time the winning outcome sided with Syracuse. The conclusion that we arrive at from this form of analysis is that in fact the odds were equal.<sup>452</sup>

The actions, limited by the board, determine the type of battle (what sort) and the beliefs of the sailors determine how (the way or the manner) the outcome will emerge. Thucydides seems to develop a tropology of human nature, “the way that human beings behave” (τοῦ ἀνθρωπείου τρόπου, 1.76.2),<sup>453</sup> which included a tropology of human interaction.<sup>454</sup> Other forms

<sup>451</sup> lit. “in some way”. Note also that the three groups on land make a last appearance, once the Athenian navy is routed to shore. The infantry no longer had differing beliefs (οὐκέτι διαφόρως) but with one impulse (ἀλλ' ἀπὸ μιᾶς ὄρμης) let out laments and groans from the defeat. Some ran to the aid of the ships, others to guard the rest of the wall, and “the majority” (οἱ πλεῖστοι) considered “in what way” (ὅπῃ) they themselves might be saved (7.71.6).

<sup>452</sup> Contra Ostwald (1988) 50, “the Syracusans plan to compel them to fight them in a sea battle at a spot where the odds would be in their own favor (VII.51.1)”.

<sup>453</sup> CT 3 ad loc.; Shanske (2007) 167-8, on “Kind (*Toioutos*)” at 1.22.4. He interprets the repetition of events “as such or similarly to such”, and not the exact repetition of events.

<sup>454</sup> For the definition of *tropology* see Quintilian *Inst.Or.9.1*, a trope is a primarily poetic analogy (Suda s.v. Gorgias’ *katachresis*) whose extended definition is the art of deviating from the normal arrangement of words to establish proof, for the purposes of persuasion (in our case, to persuade the reader). Quintilian describes a figure for proof, i.e. an artfully arranged argument, with an agonistic metaphor (a duel).

of tropology were in vogue at Thucydides' time, most notably that of the "Pythagorean way of life" (Πυθαγόρειον τρόπον ἐπονομάζοντες τοῦ βίου διαφανεῖς πρᾶ).<sup>455</sup> In this episode, Thucydides' unique tropology of interaction appears to have a predictive function.

The spectators as a collective can predict the outcome, and yet not affect it and thus constitutes a form of prognostication without control. There was however control of the environment. The Syracusan decision to restrict the interaction to the harbour evened out the odds, so that the Athenian superior skill in naval warfare was nullified.<sup>456</sup> The Syracusans determined the type of match and turned what could have been a Victorian boxing match of clean punches into a bare-knuckle-thrusting slugging match, which was a return to a more basic form of warfare. The reader is left with the following prognosis: one does not win wars with elegance.

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<sup>455</sup> Cf. 8.24.5.

<sup>456</sup> Cf. 7.62.2.

## Chapter 2 - Dynamic Games - Extensive Form

Diodorus and Dionysius of Halicarnassus already in antiquity criticized narratives like that of Thucydides, since it jumps around from one geographical location to another as events unfold chronologically. They argued that historical narrative could not imitate reality, since in reality simultaneous events would be recorded by necessity at different times in the narrative as text. (Diod. XX.43.7; Dion. Hal. *De Thuc.* 9)<sup>457</sup> Thucydides' non-causal temporal arrangement is both linear and cyclical, as in the counting war years and summer/winter seasonal cycle, and have been carefully studied.<sup>458</sup> Thucydides, however, links causal reality differently from the way he structures non-causal reality.<sup>459</sup> Thucydides' failure to record simultaneous events realistically did not affect his successful method of describing strategic reality (e.g. simultaneous move interactions). We saw that Thucydides with respect to strategic interactions found one way to solve the problem of describing simultaneous interaction with the use of sight; either as coming into view, or as multi-perspective spectatorship.

Much like strategic reality, Thucydides also explores a method of describing dynamic reality. These are evidently easier to describe since, by virtue of the written text, information is fed to the reader in sequence. A dynamic

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<sup>457</sup> The modern consensus is to agree with D.H.: Wilamowitz (1921) 306; Abbott (1925) 177; Kitto (1966) 290; Finley (1942) 107; Lateiner (1989) 44, and in antiquity Lucian *Hist. consc.* 55, in the defence of Thuc POxy 6.853.

<sup>458</sup> Non-causal linear/ cyclical time: linear - counting of war years/ cyclical - seasons (1.1.1, 2.1.1, 5.20, "according to a natural division of time", κατὰ τοὺς χρόνους/ years by summers and winters, κατὰ θέρον δὲ καὶ χειμώνας ἀριθμούν, HCT iv.699-715, esp. 705 includes spring and autumn in summer); arrangement is appropriate for his military topic with a summer campaigning season, CT 2. 235; Hdt. may anticipate Thuc. (Hdt.5.115.2, 6.18, 6.31.1, Jacoby RE 'Herodotos' col.440); Gomme argues for a "fixed limit" of "a little over eight months" Gomme HCT iv 703, 709, clashes with authorial 5.20, Thuc. "reckons in summers and winters ... each of these being equivalent to half a year", see also Darbo-Peschanski (2000) 91-114, esp. 106ff.

<sup>459</sup> Koselleck (1979 [tr. 2004]) 95, on the distinction between causal and non-causal temporal structures: 1. The irreversibility of events, before and after – e.g. counting years 2. The repeatability of events – e.g. cycle of seasons 3. And, the contemporaneity of the noncontemporaneous (*Gleichzeitigkeit der Ungleichzeitigen*) or "the prognostic structure of historical time" – e.g. anticipation, players think about the causal chain.

**game** or sequential move game is a description of two or more players making choices one after the other. To make the temporal structures even clearer we will later separate the order of a sequence of moves from more complex temporal structures which include pace, duration and repetition<sup>460</sup> as these refinements are linked to the perceptions of the characters.<sup>461</sup> One readily recognizable form of dynamic interaction is a **negotiation**, where players communicate verbally with one another in turns. I first explore the mechanics of the *agon* and the law in Thucydides to explicit the environment (or board) of the negotiation procedure itself.

### **Agon and Law**

Negotiations are verbal *agones*. In Thucydides, the speeches and forensic debates produced by Athenians and by foreigners are suffused with a legal flavor. Arbitration is characterized as a competition. A trial is a contest of words. The Spartans put the Plataeans on trial for fighting for the Athenians. After the Plataean defence speech, the Thebans intervene with their prosecution (3.67.6).

ποιήσατε δὲ τοῖς "Ελλησι παράδειγμα οὐ λόγων τοὺς ἀγῶνας προθήσοντες ἀλλ' ἔργων

Offer an example to the Greeks that the contests to which you [Spartans] invite them are **of actions not of words**

Here the Thebans lay down the distinction between contests of action and contests of words. In general, speakers blame competition, the *agon*, for the inability to *arbitrate among states* and, within the state, *among assembly speakers*. The speeches repeatedly stress that an interstate debate or policy debate should be about balanced influence so that judgment is made from a position of equality.<sup>462</sup> The Athenians make this resoundingly clear to

<sup>460</sup> Narratology usually divides time into speed/duration, frequency and order, see Genette (1972) 77-182, (1983) 15-27.

<sup>461</sup> Rood 62, Rood points out the importance Thucydides attaches to the function of cognitive dissonance, where an actor's past determines present behavior and therefore other plots for the future, while, that actor's future is already in the past for both reader and historian.

<sup>462</sup> Morrison (2000) 127n27; the Spartan trial of the surrendered Plataians (2.53-69) is referred to as an *agon* on account of their disadvantage, see CT 2.447: "the Plataians are

the militarily inferior island of Melos. “You are not in an equal contest (οὐ ... ὁ ἀγὼν ἀπὸ τοῦ ἵσου ὑμῖν), so questions of honor maintained or shame avoided have no relevance. You should be thinking of your survival, and that means not resisting a force much stronger than you.” (5.101) The Athenians remind the Melians that their weakness is the reason this is a contest of actions and not of words.

It is argued elsewhere that one state cannot submit to arbitration when the other state finds itself in an advantageous position. The Corinthians speak at Athens regarding their inability to settle their dispute with Corcyra in arbitration (1.39).

καὶ φασὶ δὴ δίκη πρότερον ἔθελῆσαι κρίνεσθαι, ἦν γε οὐ τὸν προύχοντα καὶ ἐκ τοῦ ἀσφαλοῦς προκαλούμενον λέγειν τι δοκεῖν δεῖ, ἀλλὰ τὸν ἐξ ἵσον τά τε ἔργα ὁμοίως καὶ τοὺς λόγους πρὶν διαγωνίζεσθαι καθιστάντα.

“They say [i.e. the Corcyreans] they wished the matter to be brought to trial, while holding beforehand a position of security and advantage, but credit is due to one who, before establishing a contest [i.e. appealing to arms], in deeds as well as in words, places himself on an equal level with his adversary.

Equality is a prominent theme regarding Athens and Mytilene interstate relations, in particular, in the Mytilenian speech to the Spartan congress at Olympia. (3.9-14) They argue that a position of equality (ἀπὸ τοῦ ἵσου,<sup>463</sup> 3.10.4) is couched in terms of influence, so that a comparison may be drawn between those with “equal influence” (ἴσοψήφος, 3.11.4) and those with greater influence (πολυψήφια, “a large number of individual votes”, 3.10.5 with 3.11.2). Similar character (ὁμοιότροποι) leads to consistency (βέβαιοι) in “similar judgment and intention” (ἴσοι μὲν τῇ γνώμῃ ὄντες καὶ

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right that for the Spartans to define guilty, lit. ‘unjust’, as ‘not helping Sparta in the war’ is a shocking equation of justice with one’s own advantage”... as a result of the Plataians’ “position of weakness”.

<sup>463</sup> 3.11.1; for position shared by contemporaries, DK VS B102.

εύνοία, 3.10.1, 3.9.2).<sup>464</sup> It is inequality in all its diversity that brings about an *agon* (3.10.1).

ἐν γὰρ τῷ διαλλάσσοντι τῆς γνώμης καὶ αἱ διαφοραὶ τῶν ἔργων καθίστανται.

For the differences in judgment lead to a difference in actions.

In the assembly at Athens, Cleon speaks before the *demos* about *how to judge* policy. The debate regards the fate of the now rogue state of Mytilene. The assembly of the *demos* must decide whether they should massacre the Mytilenian people or not (3.37.4-5).

κριταὶ δὲ ὄντες άπὸ τοῦ ἵσου μᾶλλον ἢ ἀγωνισταὶ ὄρθοῦνται τὰ πλείω. ὡς οὖν χρὴ καὶ ἡμᾶς ποιοῦντας μὴ δεινότητι καὶ ξυνέσεως ἀγῶνι ἐπαιρομένους ...

Content to be judges among equals rather than competing contestants, they generally conduct affairs more successfully. These [the former] we ought to imitate, and not be so carried away by cleverness and contests of intelligence...

Both speakers in the Mytilenian debate, Cleon and Diodotus, refer to the debate as an *agon* in a strictly competitive sense.<sup>465</sup> (3.40.3, 3.44.1) Thucydides in his own words calls the struggle of the decision-making process of the voters an *agon*. They entered into a contest of opinion, (οἱ Αθηναῖοι ἦλθον μὲν ἐξ ἀγῶνα ὅμως τῆς δόξης, 3.49.1). This form of contest is psychological. Legal terminology may serve to emphasize the procedural structure of other types of disputes. The most interesting of which is the boundary dispute at Delium. He allows “two senses of *agon*, ‘battle’ and ‘judicial dispute’”, to operate simultaneously.<sup>466</sup> This formulation of the *agon*

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<sup>464</sup> CT 2 ad loc.

<sup>465</sup> Another instance of an athletic metaphor to describe the *agon* of war, in this case, is at 6.72.4 on Athenians versus Syracusans, “for amateurs playing a game against professionals”. Another is in Pericles’ *Funeral Oration* at 2.46.1 who calls the fallen in the first year of the war “[athletic] competitors” competing for “a crown”.

<sup>466</sup> Allison (2011) 138, 144, for the exquisite article on the intersection of competition and spatial constraint united by legal terminology and procedure. Here too the subtext is that law cannot operate in contests. “What might have been negotiated or arbitrated by neighboring states is rent apart by war. The legal course that functions as a subtext in the end fails. ... war is shown to have corrupted a feature that belongs normally to civilized

as grounded in the *inequality among competitors* is not Thucydides' exclusive view of the law, which in fact permeates the speeches and the narrative in other contexts other than the *agon*.

Throughout the *History*, the forensic-deliberative debate is a contest to win votes from judges, who act like theatre spectators (θεαταὶ, 3.38.4) judging an athletic competition. The solution proposed by the speakers is that there should be a balance of advantages and disadvantages among arbitrating states in international relations. Whereas, in *intrastate* political debate, judges should arbitrate by weighing speakers arguments by the strength of their points, not by the wit of the speech's rhetorical arrangement. The *agon* in law prevents the *equality* and *fairness* of the speakers' *position* and the voters' *judgment*, respectively.<sup>467</sup>

The most famous example of a call for fair arbitration is that made by Athens before the war. When Pericles denounces the Spartans for refusing to submit their differences to arbitration, we must consider the reasoning behind Pericles' staunch position to neither withdraw from Plataea, nor set Aigina free, nor repeal the Megarian decree. He argued that states should enter arbitration "retaining their respective holdings in the interim" (ἔχειν δὲ ἐκατέρους ἀ ἔχομεν, 1.140.2-3). This at first appears to be a contradiction of *fair* legal practice. But in fact at the end of his speech, Pericles elaborates:

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behavior, in this case, the legal process for resolving land disputes." Although in her argument the features of the legal *agon* are the evidence for the collapse in boundary disputes, she concludes that it was the *agon* of war. I do not believe this to be the message: instead, arbitration cannot operate when there is an *agon* over land.

<sup>467</sup> Loraux (2001) 232-242, on the "trial as struggle" which is "between two adversaries made rigorously equal" (232) and who are judged "not by law but by "equity"" (240). Rawls (1971) 126-130ff. On the circumstance of justice, John Rawls in the "Theory of Justice" noted that although "society is cooperative" each individual's "plan, or conception of good" creates "competing interests". Thucydides' version of social contract adds to this the *process* leading to the *imbalance*, extending the problem of competition in law. A particularly important discussion of the *agon* is by the sociologist Roger Caillois in "Man, Play and Games" ([1958] 1961). *Agon* is defined as "the search for equality" which "is so obviously essential to rivalry that it is re-established by a handi-cap for players of different classes". Still, he admits that "absolute equality does not seem to be realizable" (14ff.). He defines the structure of games as *agon* (competition in equality), *alea* (chance, lit. Latin for dice), mimicry (simulation) and *ilinx* (vertigo, lit. Greek for whirling). His definitions are grounded in Huizinga's *Homo Ludens*, and is a purely descriptive treatment that is well read in the other presentations of games, including von Neumann and Morgenstern, whose models in *Theory of Games* he describes as "peculiarly more complex mathematical structures" (p.161ff.).

Sparta must also be made to relinquish some of its holdings in order for arbitration to be possible (1.144.2).<sup>468</sup> Pericles offers a point for point counter demand. They must not conduct any more expulsions of foreigners in return for repealing the Megarian decree and they must also return independence to their subjects in return for a withdrawal from Plataea and the release of Aigina (the withdrawal and release are implied). This he says is “fair” (δίκαια). The Athenians take his advice and demand the Spartans submit to “fair and equal terms” (έπι ἵση καὶ ὁμοίᾳ, 1.145). The rejection of the ultimatum led to the collapse of the treaty and represented two of the four “publicly alleged causes” or *aitiai* of the war: Corcyra, Potidaea, Aigina, and Megara.<sup>469</sup> The Spartans refuse to submit to this form of ideal legal equilibrium, and thus Athens enters the *agon* of war.

## Negotiation

Negotiations in the *History* are in most instances marked by the use of ὁ λόγος /λέγω with ποιέω/έρχομαι, which mean literally that one “makes proposals” or “comes with proposals”. The party being approached to begin negotiation is usually in the dative or follows πρὸς in the accusative. A one-sentence summary of the negotiations may be all, such as “Sitalkes began negotiations with Perdiccas” (Σιτάλκης πρὸς τε τὸν Περδίκκαν λόγους ἐποιεῖτο, 2.101). Thucydides may also provide the actual offer, such as when “some came to negotiate with Alcibiades, who made an offer ...” (τῷ τε Ἀλκιβιάδῃ ... τινὲς ... ἐξ λόγους ἥλθον, καὶ ὑποτείνοντος ... ποιήσειν. 8.48). Then there are narratives entirely dedicated to negotiations such as the Melian Dialogue where the Athenians come to negotiate with the people of Melos (λόγους ... ποιησαμένους, 5.84.3), whereby a lengthy debate ensues about which type of negotiation they should follow: in short, a negotiation about negotiation.

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<sup>468</sup> This idea of relinquishing a position of advantage finds a parallel in that Athens and Sparta's Thirty Years Peace required that Athens relinquish Nisaea, Pagae, Troezen and Achaea (1.115.1 with 1.144.2) and both sides were limited to their choice of alliances OPW 293ff. It is almost as if the Peace meant to restrain growth for the benefit of international arbitration.

<sup>469</sup> CT 1v.107ff.

In the process of a negotiation, some offers may come with demands, requiring a compromise. However in others, there may be nothing but demands, usually referred to with the verb κελεύω. To understand the Melian Dialogue, one must first look back to the beginning of the war itself.

In the year 432 BC, the Spartans vote that they “must go to war” (πολεμητέα εῖναι) against Athens (1.79, 1.88). Before they can “openly (φανερῶς) undertake the war and invade Attica”, they needed to bide time to prepare for war. (1.125.2)<sup>470</sup> In the meantime, the Spartans decided to send complaints to Athens, from which an exchange ensued. The Spartans in the last of a series of exchanges demanded that the Athenians “give the Greeks back their independence” so that there may be peace or else go to war. This offer to submit came after the Spartan assembly had already voted for war, so what was the purpose of this offer? (1.125)

The episode, often called the *Spartan ultimatum*,<sup>471</sup> is bracketed with the following phrase. It begins and ends with Thucydides’ explanation that the breakdown in negotiations was “the greatest pretext for fighting” (μεγίστη πρόφασις εἴη τοῦ πολεμεῖν (1.126) ... ἦν καὶ πρόφασις τοῦ πολεμεῖν (1.146)). This statement is meant to signal that Sparta created an environment in which she forced Athens to reject her offer of peace with demands which would dismantle the Athenian empire, especially Athenian control over their own foreign policy, and which Pericles described as “enslavement just the same” (141.1). The is not to say that Athens did not actively meet Sparta’s requests for a fight.<sup>472</sup> When both sides ceased bargaining, they sent no more heralds or ambassadors to one another. The end of negotiations is the outcome and the reason/ the cause for the dissolution of the treaty: “For these events constituted a violation of the treaty and a reason (*prophasis*) for going to war”. (1.146)

<sup>470</sup> 1.82.2, they are following Archidamos’ advice.

<sup>471</sup> Westlake (1973) 103, for the phrase “Spartan ultimatum”; Rhodes (1987) 156, “her ultimatum” on 1.139.3; Lazenby (2004) 29, 31.

<sup>472</sup> Both 1.126 and 1.146 are gerund constructions, which is an articular infinitive that functions as a complimentary idea to *prophasis*. These are similar in motivation to the words used to describe the vote in the Spartan assembly to go to war; a war that “must be fought” – πολεμητέα εῖναι (88, 79). Both are active in meaning. ▼

Chris 24/3/16 23:30

Comment [4]: In footnote I would kill the last sentence.

Manuela Dal Borgo 30/6/16 13:51

**Deleted:** The gerund is an active action, such that the Spartans actively place themselves and the Athenians in a position of necessity, while the impersonal verbal adjective possesses the force of to act, such that there is no other alternative. See Goodwin sect. 1597.

## The Spartan Negotiation (1.126 - 146)

After the Spartans vote for war, the negotiation begins when the Spartan king Archidamos advises the Spartans to send embassies to make complaints to bide Sparta time to prepare for war. Should the Athenians yield to the Spartan ambassadors, this would be best of all, if not they would have 2 to 3 years to prepare for war (*ἢν μεν ἐσακούωσι τι πρεσβευόμενων... ἢν δὲ μή...*, 1.82.2). The negotiations in reality lasted less than one year.<sup>473</sup> Thus, the Spartans kept sending embassies so that they may have the greatest cause to go to war, if they should not yield to anything (*ἐπρεσβεύοντο ... ἐγκλήματα ποιούμενοι*, ὅπως σφίσιν ὅτι μεγίστη πρόφασις εἴη τοῦ πολεμεῖν, *ἢν μή τι ἐσακούωσιν.*, 1.126.1).<sup>474</sup>

### Players, Actions and Preferences

The Spartan ambassadors at Athens deliver Spartan demands and also receive Athenian replies with counter-demands to take back to Sparta. Players are referred to as “Spartans”/“Spartan ambassadors” and “Athenians”. The Spartans and Athenians exchange verbal demands over several months. Which institutional body is formulating demands, replies and counter-demands is not described, except in the final exchange.<sup>475</sup> The Athenian assembly (*ἐκκλησία*) makes the final counter-demand.

<sup>473</sup> CT 1.202, 238. Thucydides writes: “not a year, but less”.

<sup>474</sup> Eventual conditional embedded in a purpose clause.

<sup>475</sup> Badian (1993) 157-8, argues that all proposals hitherto had been put forward to the Athenian council of 500 (*boule*) and that only when the decision was taken “once and for all” do all the Spartans demands come to light before the People’s assembly (*ekklesia*). I am not convinced of this view since the terminology for demands and counter demands is quite formal (especially the care with which Thucydides marks off the “First” from those “After”). In the third exchange, the series of embassies carrying new demands from Sparta may have very well received an answer after a debate in the assembly. Given the similarly formulated exchanges (first, second, third, last) the Athenians may have held an assembly for all. Further comments on the historical fact for whether the *boule* or *ekklesia* were summoned, see CT 1.225, 418-9. Hornblower notes that with respect to precision Thucydides is “capricious rather than studiously vague” and uses such words as *boule* “if and when he feels like it”. Thucydides is primarily concerned with the structure of the interaction rather than with which constitutional body gave the response.

### **First Exchange:** Spartan Demand and Athenian Reply

The negotiation proper begins with the Spartans making a demand: “**First** the Spartans demanded the Athenians...” (**πρώτον** ... οἱ Λακεδαιμόνιοι **έκέλευον** τοὺς Ἀθηναίους..., 1.126.2 [again: In this way, the Spartans demanded they... οἱ Λακεδαιμόνιοι **έκέλευον...**, 1.127.1 ]) Pericles would “**not** let the Athenians **yield**, but urged them to war” (καὶ **οὐκ** εἴα **ύπεικειν**, ἀλλ’ ἐς τὸν πόλεμον ὕρμα τοὺς Ἀθηναίους, 1.127.3).

### **Second Exchange:** Athenian Demand and Spartan Reply

The Athenians did not yield, and instead made their own demand: “The Athenians made a counter demand that the Spartans should ...” (**ἀντεκέλευον** δὲ καὶ οἱ Ἀθηναῖοι τοὺς Λακεδαιμονίους, 1.128.1). The **first** Spartan demand was answered with an Athenian counter demand (Λακεδαιμόνιοι δὲ ἐπὶ μὲν τῆς **πρώτης** πρεσβείας τοιαῦτα **έπέταξάν τε καὶ ἀντεκελεύσθησαν...**, 1.139.1). We here of no reply from the Spartans, which can be understood as a tacit “no, we will not yield”.

### **Third Exchange:** Spartan Demand and Athenian Reply

Following these two exchanges, later the Spartans proceed to make several visits to and fro to Athens with an increasing number of demands. (**ὕστερον** δὲ φοιτῶντες παρ’ Ἀθηναίους... **έκέλευον...**, 1.139.1; cf. see note on εἰώθεσαν, 139.3) The Athenians do not yield to any of these demands (οἱ δὲ Ἀθηναῖοι **οὔτε τάλλα **ύπήκουον...****, 1.139.2).<sup>476</sup> This was a simple “no” in the form of a tacit reply.

### **Final Exchange:** Spartan Demand and Athenian Reply

**Finally, the last ambassadors from Sparta arrived**, without reiterating the previous demands, and delivered an all encompassing demand (**τέλος** δὲ

<sup>476</sup> At 1.139.2, the Athenians make a separate accusation against the Megarians, which would not constitute as a reply to the Spartans.

ἀφικομένων **τῶν τελευταίων πρέσβεων** ἐκ Λακεδαιμονος... καὶ λεγόντων ἄλλο μὲν ούδεν ὃν πρότερον εἰώθεσαν,<sup>477</sup> αὐτὰ δὲ τάδε ὅτι..., 1.139.3.). The final demand was: "The Spartans want there to be peace, and there would be if you give the Greeks back their independence". To which the Athenians hold an assembly and a general debate, and resolve to consider the whole question and give their answer once and for all. (ποιήσαντες ἔκκλησίαν οἱ Ἀθηναῖοι γνώμας σφίσιν αὐτοῖς προυτίθεσαν, καὶ ἔδοκει **ἄπαξ περὶ ἀπάντων** βουλευσαμένους **ἀποκρίνασθαι**.. 1.139.3). The Athenians follow Pericles' advice:

οἱ δὲ Ἀθηναῖοι νομίσαντες ἄριστα σφίσι παραινεῖν αὐτὸν ἐψηφίσαντο ἃ ἐκέλευε, καὶ τοῖς Λακεδαιμονίοις ἀπεκρίναντο τῇ ἐκείνου γνώμῃ, καθ' ἔκαστά τε ὡς ἔφρασε καὶ τὸ ξύμπαν, **οὐδὲν κελευσόμενοι ποιήσειν**, δίκη δὲ κατὰ τὰς ξυνθήκας ἐτοίμοι είναι διαλύεσθαι περὶ **τῶν ἐγκλημάτων** ἐπὶ ἵση καὶ ὁμοίᾳ.

The Athenians concluded that he had given the best advice and voted as he recommended. They gave their answer to the Spartans ... and said **they would do nothing in response to demands** but were ready to go to arbitration ... to deal with their complaints on a fair and equal basis. (1.145)

What is immediately apparent in these exchanges is that this interaction is definitely not a one shot interaction, in other words it is NOT an ultimatum. Badian excuses the descriptive laxity of some scholars arguing that this episode is referred to as an "ultimatum" in the sense that negotiations end.<sup>478</sup> Scholars use the word 'ultimatum' to refer only to the final demand at 1.139.3, not to the whole chain of negotiations. Still, to be precise, this episode is a dynamic interaction with more than one, but also with a finite number of moves and counter-moves. The interaction was expected to last from two to three years and in reality did last almost one year. When the negotiation will end is uncertain, however that the negotiation will end is.

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<sup>477</sup> This must mean that some of the earlier demands were made more than once, perhaps several times, and likely during the third offer.

<sup>478</sup> Badian (1993) 234 ft.59.

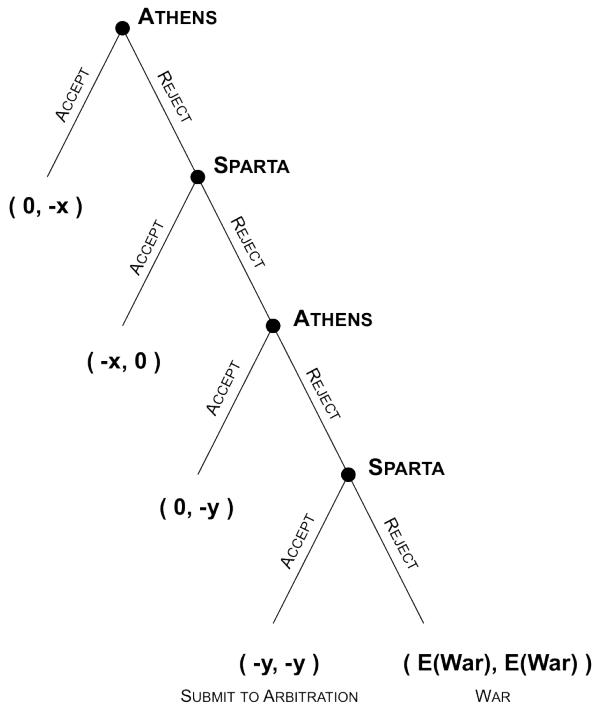


Figure L

In order to represent this sequential interaction we use a series of branches. Player 1 is Sparta and Player 2 is Athens. Demands are represented by the payoffs. The **game tree** above represents the available action of a player in turn: to yield or reply with a counter demand. Equivalently, I use Accept or Reject the demand or counter-demand of an opponent to make terms easier. In our case, a **demand** implies a negative payoff, unlike an offer, which implies a positive payoff. Once a demand is received, if the player Accepts the game ends, if the player Rejects the game continues with the rejecting player making a counter demand. Sparta is the first to make a demand, Athens Rejects and replies with a counter-demand.

## Payoffs

The payoff for a demand to drive out a curse from Athens or Sparta is denoted  $-X$ , and the final Spartan demand is denoted  $-Y$ . Athens is asked to relinquish her hegemony. (...) The Athenian's final counter-demand, which asks that Sparta relinquish a comparable amount of influence, is likewise denoted  $-Y$ . The Spartans are last to move and their payoffs represent the choice between either settling for  $-Y$  or giving into the prospect of war and its uncertain future benefits and costs, denoted as the expected payoff from *War* =  $E(War)$ . If we consider extremes, complete annihilation is the expected negative payoff from war, as is the position of Greek hegemon the expected positive payoff.

## Escalation

The Spartan escalation we intuit is premeditated. In the final exchange, the Athenian demand is formulated in such a way as to make it less acceptable than the alternative. That is to say that the expected payoff of war for the Spartans outweighs any sure loss that is demanded in the present. Much the same can be said for the Athenians. Sparta chose not to make further counter-demands, which implies that the prospect of war,  $E(War)$ , was perceived to be a lesser loss than that of arbitration,  $-Y$ .

Notably, there are no actual benefits accrued or costs incurred throughout the exchanges while players make verbal demands and counter-demands. This is one way Thucydides found to describe the intangible incentives of necessity (*ananke*), which compel (*orme*) players toward an outcome as a result of the prospect of a positive payoff.

In effect, Sparta has engaged in brinkmanship, forcing the other party to take a decision to submit to demands or to "call her bluff". Sparta's decision from an *a posteriori* perspective demonstrates that any outcome from

arbitration, which we call –Y, is less desirable than the prospective outcome of war, E(War). The first exchange initiated by the Spartans follows the **strategy of brinkmanship**. This strategy overcomes any attempt at compromise by the very fact that brinkmanship is an uncompromising strategy. Sparta's reason for war (or overt cause) is now being advertised as Athens' refusal to "give the Greeks back their independence",<sup>479</sup> which benefitted the Spartans, who were already preparing for war, by rallying the Greek world. The implication being that Athenian intransigence had led to war. Athens at face value is attempting to pursue a strategy of 'compromise', with the suggestion that both parties submit to arbitration and give and take proportionally. Still, the Athenians may be a little more calculating than this. Their demand certainly allows for a peaceful resolution, but it also transfers the onus of responsibility to the Spartans in the event of war.

We know from Thucydides' narrative that the overt and covert agendas of Sparta diverge. The overt "greatest pretext" (*megiste prophasis*, 1.126.1)<sup>480</sup> was the most "apparent in speech" (ές τό φανερὸν λεγόμεναι, 1.23.6), whereas the 'truest' cause is "least apparent in speech" (ἀφανεστάτην ... λόγω, 1.23.6). The exchange of complaints, formulated as demands to rectify these complaints, served to appear to be the "greatest cause", since it would appear to the Greek world that it was this bargaining failure that had forced a complete breakdown in communication. Thucydides' himself confirms this, reporting that, "Public support in general was very much on the side of the Spartans, especially as they proclaimed that they were liberating Greece". (2.8.4-5) Pericles whose advice the Athenians followed knew the Spartans no longer sought peace since "it is thoroughly understood that it is necessary to go to war ... and that for the greatest dangers emerge the greatest honours." (1.144.3) The Athenian counter demand to go to arbitration was an intentionally "doomed strategy". It

<sup>479</sup> Note the vagueness of this demand. The previous demands were precise and clear. So compliance was easily evaluated. This one is boundless. On the most obvious interpretation it would mean giving up the empire.

<sup>480</sup> Neither HCT ad loc. nor CT 1. ad loc. take note of *megiste*.

signals to the Spartans that Athens too is prepared for war, and is herself ready to risk defeat rather than comply with a present loss. The negotiation was pretense.

Such doomed strategies are found elsewhere. They are at one point undetected, but backfires, or called a “trick”, but discovered. Alcibiades taking recourse of a clever trick (τρέπεται ἐπὶ τοιόνδε εἶδος 8.56.2) attempts to hide his inability to secure money from Persia by making increasingly “excessive demands” (8.56.4)<sup>481</sup> until the Athenians realise his deceipt. Nicias attempts this trick, but it backfires: What then are the conditions under which both parties can conduct negotiations truthfully? Pericles' recommendation to the Athenians to go to war will elucidate the matter (1.141.1-2).

Make up your minds here and now, either to **submit** before any harm is done, **or**, if it is to be **war** (ἢ **ύπακούειν** πρίν τι βλαβῆναι, ἢ εἰ **πολεμήσομεν**), and in my view that is the best course, to make no concessions for reasons either great or small, and refuse to live in constant fear for our own possessions. Any claim enforced on their neighbours and **equals** *without recourse to arbitration* (δικαίωσις ἀπὸ τῶν ὁμοίων πρὸ δίκης τοῖς πέλας ἐπιτασσομένη), no matter whether the issue is of the greatest or the least significance, amounts still to **enslavement** (**δούλωσιν**). Now, as regards this war and the resources available to either side, listen while I explain point by point and understand why we are **not the weaker** party (**οὐκ ἀσθενέστερα**).

In Thucydidean negotiations, the difference between an offer that is fair/just to an offer that is unfair/unjust is the result of the power distribution among the players. Fair offers emerge from players who have some power parity, whereas unfair offers are the result of an interaction between unequal powers. Game theorists have traditionally assumed that the difference between a fair offer and an unfair one is to do with the temporal structure of the game. When faced with an infinite number offers and counteroffers, the optimal strategy prescribes that the player to make the first offer should be

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<sup>481</sup> Cf. 8.81.2.

fair.<sup>482</sup> Whereas, if there is only one offer, i.e. an ultimatum game, the optimal strategy prescribes that the player to make the first and only offer should be unfair.<sup>483</sup> This is the case in the next example. The Melian Dialogue has players reply to each other immediately, rather than as in the *Spartan Negotiation* where communication is couriered through ambassadors intermittently over the course of a year.

### **Melian Dialogue (5.84-116)**

The Melian Dialogue is unique in its narrative structure, being the only dialogue in the *History*.<sup>484</sup> At the same time, it is similar thematically to the *Spartan Negotiation* as we shall see. The narrative is introduced as a form of negotiation such that the Athenians send ambassadors to make proposals. Here the Athenians make an offer, whilst the Melians attempt to negotiate or rather submit the offer to arbitration in order to revise it. Arbitration or any form of justice, the Athenians argue, is only possible among two players of equal strength and therefore their *take it or leave it* ultimatum is best suited for this situation.<sup>485</sup> The Melians attempt to grasp at moral and ethical reasons for why the Athenians should reply to a counter offer. The Athenians stand by their ultimatum and enforce it, because these generals are mandated negotiating agents.

#### **Board – Temporal structure**

The basic structure of the negotiations is that of a proposal on the part of the Athenian ambassadors, followed by a reply on the part of the Melian magistrates and ruling men. The Athenians **make a proposal** (λόγους πρῶτον ποιησομένους ἐπεμψαν πρέσβεις, 5.84.3). Since the Melians insist on holding the meeting in private before the magistrates and leading men, the ambassadors request permission to deliver their offer at leisure

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<sup>482</sup> Rubinstein (1982).

<sup>483</sup> Güth et al. (1982).

<sup>484</sup> Hudson-Williams (1950) 156-69; Macleod (1983) 52-54, on the rhetorical form of the dialogue as a “common deliberation”, unlike a Platonic dialogue taking the form of consistent questions and refutations; CT. 3.216-225 for bibliography.

<sup>485</sup> Chew (2013) 222-224, on bargaining and status as a commitment device. “If I am stronger than you, I do not need to consider your situation because nothing you do can help or harm me.”

(καθ' ἡσυχίαν = to take their time or informally, 5.86).<sup>486</sup> The usual form of address in Athens would have been in the form of a **single continuous speech** before the popular assembly (μὴ ξυνεχεῖ ρήσει... ἐνὶ λόγῳ, 5.85). The Athenians ask for permission: “And firstly say if what we are saying is to your liking” (καὶ πρῶτον εἰ ἀρέσκει ώς λέγομεν εἴπατε., 5.85). The Melians grant it: “Let the negotiation be in the way you propose, if it seem good to you” (καὶ ὁ λόγος ὡς προκαλεῖσθε τρόπῳ, εἰ δοκεῖ, γιγνέσθω, 5.87). A conversation ensues.

Both agree that their negotiation is about the survival of the Melian state (περὶ σωτηρίας, 5.87 and 5.88). The Athenians will grant them survival if they submit as subjects to the Athenian empire. Given the Melians are inferior in strength to themselves, the Melians should accept whatever the stronger is so kind to allow them to keep, in this case their lives (5.89). The Athenians insist that it is **common knowledge** (έπισταμένους πρὸς εἰδότας, [lit. you know as we both know], 5.89) that expediency is justice. The Melians object to the Athenians’ definition of expediency (*to xumpheron*, 5.90) and insist that the Athenians offer fair terms (*to diakaion*, 5.90) rather than merely survival, which amounts to slavery (*douleian*, 86). The Athenians retort that justice is only an option among parties that are to some degree equal.<sup>487</sup>

τὰ δυνατὰ δ' ἔξ ὃν ἐκάτεροι ἀληθῶς φρονοῦμεν διαπράσσεσθαι, **έπισταμένους πρὸς εἰδότας** ὅτι δίκαια μὲν ἐν τῷ ἀνθρωπείῳ λόγῳ ἀπὸ τῆς ἵσης ἀνάγκης κρίνεται, δυνατὰ δὲ οἱ προύχοντες πράσσουσι καὶ οἱ ἀσθενεῖς ξυγχωροῦσιν.

We are concerned with the possible [actions] we both truly believe are done. You know, as well as we do, that within the limit of human calculation judgments about justice are made between those with **an equal power to**

<sup>486</sup> Macleod (1983) 54, for *κρίνεται* as a word used in the assembly Cf. 1.87.2, 120.2; 2.40.2; 3.37.4, 43.5; 6.39.1).

<sup>487</sup> Bosworth (1993) 39, esp. 39ft.45 and 46. “This does not of course imply that justice subsists between powers of approximately equal magnitude, as is commonly alleged. ... but that justice subsists between individuals who are to some degree equal and not between those who are blatantly unequal, as slaves and their owners.” See Arist.*NE*v.1131.a ff, *Pol*.3.1280a11, δοκεῖ ἵσον τὸ δίκαιον εἶναι, 1282.b.18.

**enforce it** (lit. with equal necessity), *otherwise possible actions are defined by what the strong do and the weak accept* (lit. have to comply). (5.89)

This passage is often hailed as the source behind the realist jingle: might is right.<sup>488</sup> It is stern and calculating without a hint of emotional involvement. This is a recurring theme in Thucydides and other writers.<sup>489</sup> The dialogue revolves around the advantage (χρήσιμον) either side can persuade the other they can offer. After several tos and fros, the Athenians insist that the Melians' considerations of future benefits and costs are of no consequence, and that it is the present deliberation over safety, from which they have strayed, which is being considered (5.111.2, 5) The Athenians at the end of the conversation formally make an offer that the Melians become allies, and thus keep their own land and pay tribute (5.111.4).<sup>490</sup>

The Athenians now **withdraw from the negotiations** (μετεχώρησαν ἐκ τῶν λόγων, 5.112.1). The Melians deliberate amongst themselves and reach the same conclusion they had before, which was **not to yield** (οὐκ ἥθελον ὑπακούειν, 5.84.2), and **reply** to the Athenians (ἀπεκρίναντο τάδε, 5.112.1-2). They will not accept (5.112.1-2), unless the terms are beneficial to both (5.112.3). After the Melian **reply** (ἀπεκρίναντο), the Athenians **dissolve the negotiations** (διαλυόμενοι ἥδη ἐκ τῶν λόγων) informing them of the consequences of their rejection: they will lose everything (5.113).

This dynamic environment, although not immediately apparent as a result of the conversational format, is in fact an ultimatum. The Athenian offer is made only once and they withdraw to allow the Melians to make one

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<sup>488</sup> Mary Beard (2010) praising the accuracy of the translations in CT 3, "the most favorite of all Thucydidean catchphrases, repeated in international relations courses world over, and a founding text of the "realist" political analysis: "The strong do what they can, the weak suffer what they must." ... [Simon Hornblower's] more accurate translation is: "The powerful exact what they can, and the weak have to comply." This version detracts from the jingle "might is right"; Welch (2003) agrees.

<sup>489</sup> E.g. 1.73.2, "it has always been established practice for the weaker to be ruled by the stronger", with HCT i.236-44; cf. Antiphon DK87 fr.44a ll.6-33.

<sup>490</sup> CT 3.248-9.

decision (ἐξ μίαν βουλήν, 5.111). The form of the dialogue is an ultimatum but only as focalized through Athenian rhetoric.

## Descriptive Theory

The Athenians are concerned fundamentally with arguing why this offer is acceptable for the Melians; with persuading the Melians (*peistheisi*, 5.86). First, the Athenians emphasize that there is no deterrent mechanism to halt their actions. As a stronger state than Melos, Athens has no fear that they will be weaker and therefore natural law necessitates (ὑπὸ φύσεως ἀναγκαῖς) that the stronger rule the weaker (5.105.2, cf. 1.83).<sup>491</sup> Second, there is no possibility for renegotiation. The *demos* at Athens had voted, commissioned and deployed the expedition to Melos with their instructions (στρατοπεδευσάμενοι, 5.84.3). The generals were executing orders and therefore were lacking in authority to make any compromise.<sup>492</sup> The fact being that capitulation was not an option and that the form of capitulation would be by submission or annihilation. Submission they argued benefits both (5.91). The Athenians are constrained to set an offer that calculates the present alone to which the Melians initially agree to discuss (5.87) (Figure M).

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<sup>491</sup> In Melian Dialogue 5.105, 103, 111.4 in addition to references to the Melians as islanders 3.91; 5.84, esp. Athens master of the seas 5.97; In bk 5: 31; 33; 35.1; 39.1; 47.1; 54-6; 79.1; CT 3.216ff. This does not exclude a further layer that the Athenians do speak of danger 5.99 and also of other's perceptions that they are afraid 5.97. A richer model would be needed to include these factors.

<sup>492</sup> Bosworth (1993) 31-2; esp. Hobbes (1629) *To the Readers*: Thucydides "introduceth the Athenian generals, in a dialogue with the inhabitants of the Isle of Melos, pretending openly for the cause of their invasion of that isle, the power and will of the state of Athens; and rejecting utterly to enter into any disputation with them concerning the equity of their cause, which, he saith, was contrary to the dignity of the state. To this may be answered, that the proceeding of these generals was not unlike to divers other actions, that the people of Athens openly took upon them: and therefore it is very likely they were allowed so to proceed. Howsoever, if the Athenian people gave in charge to these their captains, to take in the island by all means whatsoever, without power to report back unto them first the equity of the islanders' cause; as is most likely to be true; I see then no reason the generals had to enter into disputation with them, whether they should perform their charge or not, but only whether they should do it by fair or foul means; which is the point treated of in this dialogue."

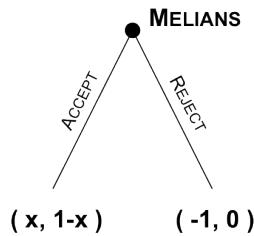


Figure M

The Athenians couch the arguments in terms of the *soteria*<sup>493</sup> or preservation of the Melians' lives and territory in return for the payment of tribute (5.88, 99, 111.4-5). This, the Melians believe amounts to slavery (5.86, 92, 100) conceding nonetheless that this would still ensure their safety (5.88).<sup>494</sup> We can assume that Melos' current status as independent or free (5.112.2) may be represented by the unit 1 so that *soteria* is just a small portion of that and may be represented by a proportion  $x$ . The Athenian profit from Melos' subjection is represented as  $(1-x)$  to describe the transference of assets and regulatory power to Athens. Melos' destruction would mean the loss of life and country to the Melians and is represented by -1, which describes the irreversible loss of "everything" (5.113, and 5.103, 111.3.). The Athenians also believe that from Melos' destruction they would maintain their hegemony without expanding the empire (5.97). This we can represent as 0, since nothing is accrued to the empire and status quo is maintained. The costs of war are seemingly absent in the discussion, so likewise are not represented here.

### Solution Theory

The Melians do not honour their initial agreement to consider the present circumstances (5.111). They understand the Athenian stance that the current state is already one of war and that the refusal to accept the offer of

<sup>493</sup> Macleod (1983) 58, σωτηρία/ ἀσφάλεια are "key-words".

<sup>494</sup> Macleod (1983) 57; CT 3.220, 5.92, 94 slavery advantages the Athenians n.b. 5.93 ad loc. citing Canfora 58f. that Athenians agree with the assessment of slavery.

submission means the investment of the city (5.86). They nonetheless disagree with this Athenian stance regarding the *state of the world*, arguing that the Athenians should consider their future gains from Melian neutrality (5.98, 112.3). With the aid of hypothetical calculations about future consequences, the Melians themselves try to persuade the Athenians that there will be a great cost to Athenian hegemony if the Athenians besiege Melos (5.87-111). The dialogue is traditionally read in moral terms, reasonably, but this does not tell the full story. The Athenians close the dialogue pointing out the folly of their belief in Sparta, fortune (*tuche*) and hope (*e/pis*). They continue the poetic ‘present-future’ or ‘near-far’ theme that the Melians judge (κρίνετε) the uncertain future to be clearer than the present (5.113, see 5.86,87).<sup>495</sup> Certainty of the present can be seen (τῶν ὄρωμένων) and miscalculations occur when this certainty is projected into the future.

This type of miscalculation is caused by weighing future prospects with greater certainty than they actually possess. Ober and Perry have argued for the correlation of hope and the over-estimation of a benefit as having low-probability of success in Thucydides.<sup>496</sup> This is called risk-loving or risk-seeking behaviour. The Athenians themselves seem to be prone to risk-loving behaviour. This has not only been noted by the Corinthians’ comparison between the risk-loving Athenians and risk-averse Spartans (1.70),<sup>497</sup> but also in the dialogue itself the Athenians assume throughout that Melos will lose if they choose to resist (5.103, 113). In point of fact, the Athenians capture Melos with greater difficulty than they led the Melians to believe in the dialogue. The Melians suffer from what the behavioural economists Daniel Kahneman and Amos Tversky call the **certainty effect** and the Athenians suffer from **overconfidence**.<sup>498</sup> The former chooses “a small hope of avoiding a large loss” over a manageable failure, the latter of “exaggerated optimism”, from which both over-weigh their probabilities of

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<sup>495</sup> CT 3.221.

<sup>496</sup> Ober, Perry (2014) 209-11.

<sup>497</sup> Ober, Perry (2014) 215-18; Ober (2010) 65-87.

<sup>498</sup> Kahneman (2011) 310-21, 255-65; Kahneman, Tversky (2000) 36 “The overestimation that is commonly found in the assessment of the probability of rare events.”

success. When states have conflicting estimates of the likelihood of victory and both sides are optimistic about their chances, a range for a bargaining agreement is obscured. If both players are risk-loving, then the offer will be lower, and acceptance will require a higher offer in order for both to prefer agreement over the gamble of war. Conversely, when the expected utility of success is calculated by risk-neutral or risk-averse players, there is always a bargaining range for agreement. A share of whatever is at issue is preferred to the downside of losing a war, regardless of whether it is a fifty-fifty chance or an even higher chance of winning.<sup>499</sup> The case in the Melian Dialogue is the reverse where the gamble, no matter how grim the odds, is preferred to any share.

### Melians Reject the Offer

When the Melians reject the Athenians' offer, the Athenian ambassadors return to the encampment in the outskirts of the city.<sup>500</sup> The generals receive the news that the Melians yielded nothing (ώς ούδεν ὑπήκουον οἱ Μήλιοι) and immediately invest the city (5.114.1).<sup>501</sup> The Athenian generals begin by building a wall around it (εὐθὺς ... περιετείχισαν κύκλω τοὺς Μηλίους, 5.114.2). The Athenians allocate the wall-building work among the several cities (διελόμενοι κατὰ πόλεις) which had joined the campaign against Melos. Once built, the Athenians retreat "with most of their army" (τῷ πλέονι τοῦ στρατοῦ), leaving only a guard to besiege the place (έπολιόρκουν τὸ χωρίον, 5.114.2). Having successfully breached the siege twice against this partial force of the Athenians, the Athenians return with "the rest of the army" (στρατιᾶς ... ἄλλης). The Melians were defeated by the strength of the siege and also with the help of traitors from within the city (5.116.3). The Athenians killed all the men of military age, enslaved the women and children, and sent out 500 colonists to resettle the city (5.116.4).

<sup>499</sup> Fearon (1995).

<sup>500</sup> 5.114.1, καὶ οἱ μὲν Ἀθηναίων πρέσβεις ἀνεχώρησαν ἐς τὸ στράτευμα; Cf. στρατοπεδευσάμενοι ... ἐς τὴν γῆν, 5.84.3.

<sup>501</sup> Note the difference between the single reply of the Melians who do not yield to this one thing = "nothing" (οὐδὲν), as opposed to the Athenians at 1.139.2 who do not yield to multiple things = "to any of these" (οὔτε τὰλλα).

In the case of Melos, negotiations preceded the investment of the city. Negotiations may also arise during a siege. In the Athenian expedition to Sicily, a negotiation arose in the midst of an Athenian siege of Syracuse (6.103.3 – 7.3.3). Being besieged more than before (καὶ μᾶλλον ἡ πρὸν **πολιορκουμένων**), the Syracusans believed they would not be able to succeed and begin negotiations. (6.103.3-4)

The Syracusans “made proposals, disposed for mutual agreement, among themselves and to Nicias” (**τοὺς δὲ λόγους** ἐν τε σφίσιν αὐτοῖς **ἐποιοῦντο** ξυμβατικοὺς καὶ πρὸς τὸν Νίκιαν, 6.103.3).<sup>502</sup> The desire for a mutually beneficial agreement was also expressed during the negotiations at Melos. The Melians suggest that an offer should be one “that is to our benefit... and happens also to be to your benefit (τὸ ἡμῖν χρήσιμον ... τυγχάνει καὶ ὑμῖν τὸ αὐτὸ ξυμβαῖνον, 5.98). It is a player’s belief of success or of failure however that determines whether offers will be accepted or not. The Syracusan belief of inferiority ensures that the negotiation is kept open. The Syracusans expect not to succeed since they expect not to survive militarily (πολέμῳ μὲν **οὐκέτι** ἐνόμιζον ἀν **περιγενέσθαι**, 6.103.3). The Athenians in the Melian dialogue tried to persuade the Melians that they would not succeed in surviving militarily (κατὰ δύναμιν δὲ τοὺς μὲν περιγίγνεσθαι... εἰ μὴ **περιγένοισθε**, 5.97). There was a window of opportunity for agreement as a result of Syracusan sentiment, yet it closes with the arrival of Peloponnesian reinforcements.

When the Syracusans are about to hold a public assembly (μέλλοντας **ἐκκλησιάσειν**) to end the war through negotiation, the Corinthian Gongylus arrives just in time to dissuade them (διεκώλυσε, cf. 1.139.3). He persuades the Syracusans not to end the war and to shut down negotiations. The Syracusans then send out a herald with a counter-offer (κήρυκα προσπέμπει, 7.3.1). The Athenians reply nothing and send the herald away (οὐδὲν ἀποκρινάμενοι ἀπέπεμψαν, 7.3.2). Again quite obviously “no reply”

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<sup>502</sup> CT 3.532.

is a rejected offer. This negotiation is pivotal. Dover believes Gongylus' arrival *changes the mind* of the Syracusans away from peace and thus considers this passage "the turning point of the campaign" in Sicily.<sup>503</sup> Compliance thus (unsurprisingly) hinges on the perception of one's own and one's opponent's strength. The narrative of the siege of Syracuse brackets this event and was what led the Syracusans to consider negotiation. Why was this siege so important? Sieges are thus our next topic of investigation.

## Siege Warfare

From the mid-sixth to fifth centuries, Herodotus and Thucydides are our main sources. Sieges in the *History* are described as dynamic interactions in terms of troop allocations for wall-building. The verbs used for sieges are *poliorkeo* – 'to besiege', *prosballo* – 'to launch an assault' and *periteichizo* – 'to wall around'. Verbs to describe the capture of a city are *lambano*, *katalambano* and *haireo* – 'to sieze', and are often followed by the prepositional phrase *kata kratos* – 'by force'. Examples abound in Thucydides, as in the Athenian siege and capture of Sestos (Σηστὸν ἐπολιόρκουν ... καὶ ... εἴλον αὐτην, 1.89.1) or Pericles' siege and failure to capture Oeniadae (ἐπολιόρκουν, οὐ μέντοι εἴλον γε, 1.111.3). Thucydides tells us that during the Peloponnesian war "never had so many cities been taken and laid waste" (οὕτε γὰρ πόλεις τοσαῖδες ληφθεῖσαι ἡρημώθησαν, 1.23.2). Hans van Wees writes that "In archaic poetry the typical city at war is a city under siege: 'one side fought to protect their parents and their city, while the other was intent on destroying it'." (*Shield of Heracles*, 239-40).<sup>504</sup> The Peloponnesian war, although fought in the classical period, replayed continuously this traditional interaction of Greek warfare.

A city under siege could be taken by force as a direct attack upon the city walls either undermining fortifications with siege engines or scaling the city walls (e.g. Plataea) or securing traitors within the city (e.g. Melos). These

<sup>503</sup> *HCT* iv.380.

<sup>504</sup> Homer *Il.*18.509-40.

might last only a few days (e.g. Stagirus, 5.6.1; Elaeus, 8.103.1; Haerae on Teos 8.20.2). Otherwise a siege could be long drawn, the more expensive kind of siege, in which the besiegers circumvallated the city, completely blockading it, and waited for the city to begin to starve and then surrender.

<sup>505</sup> In the case of Melos, the siege began as a circumvallation (περιετείχισαν, 5.114.2) and after two successful Melian raids against the circumvallation (5.115.4, 5.116.2), capitulated from the heavy siege and from treachery (κατὰ κράτος ... προδοσίας, 5.116.3). As was the case for Melos, *the outcome of a siege* was most times “the death of the men of military age and the enslavement of the children and women” and finally resettled by a different population (5.116.4) or otherwise destroyed.<sup>506</sup> A city under siege knew it faced complete annihilation, which was the “key goal of Greek offensive strategy: the display of power, whether in *hybris*, revenge or punishment, by inflicting maximum damage”.<sup>507</sup>

In the case of Syracuse, Nicias appears to have used only a circumvallation wall.<sup>508</sup> The Athenians build a circumvallation wall around the city of Syracuse, and the Syracusans build counter-walls to intercept the construction of the Athenian circumvallation wall. Scholarly discussions on the Athenian siege of Syracuse call the episode a “race”: each side building walls as quickly as they could.<sup>509</sup>

<sup>505</sup> Seaman (2103) 642-656, esp. 653-55 for an almost comprehensive list of all the sieges in Thucydides.

<sup>506</sup> **Siege of Plataea 3.68.2** – circumvallation (*periteichizo*): all men killed without exception, women sold into slavery, resettlement and later the city is torn down; **Siege of Torone 5.3** – seizure of outer-wall (*to teichisma; enkatalambano*) 700 male prisoners sent to Athens, “enslaved women and children”, prisoners return to resettle in exchange for Olynthians; **Siege of Scione 4.131, 5.32.1** – circumvallation (*periteichizo; poliorkeo*): the men of military age killed, enslavement of women and children, resettled by Plataeans; Only non-siege case involving enslavement of women: imprisonment of exiles from **Corcyra 4.48.4** where all men killed, or killed themselves, and women sold into slavery.

<sup>507</sup> van Wees (2004) 124-6, also 138-45, 149-50. In fact this is not always true. Annihilation is always a prospect, since there are no firm rules. But it is not inevitable, as we see from the fact that most cities are not annihilated in defeat. This is best exemplified with the end of the Peloponnesian war itself in 404 BC. Athens is being besieged (*πολιορκούμενοι*, Xen.*Hell.2.2.10*) and Sparta refuses to destroy it (*ξειρεῖν*), despite the demands of the Thebans and Corinthians (Xen.*Hell.2.2.20*).

<sup>508</sup> Nicias has siege machines 6.102.2, he burns them to defend the circle fort and only much later does Demosthenes use siege machines against the standing counter-wall 7.43.1, see CT 3.623-624.

<sup>509</sup> Connor (1984) 186, calls the episode “the race of the walls”; CT 3.551ff. for “The ‘Race of the Walls’ is Won”.

### The contest of *Wall/ Counter-wall* (6.93.4 - 7.6)

The distinction between the Melian Dialogue and the negotiations before the war on the one hand and the following wall construction on the other takes us from move and counter-move in the sphere of words to move and counter-move in terms of action versus words. In the case of actions and especially the swiftly changing situation on a battlefield, pace and location assume a prominent role.<sup>510</sup> This is best exemplified in *the race of the walls* at Syracuse, where Athenians and Syracusans begin wall construction in an alternating fashion. (Verbal negotiations possess the ability to back track to previous offers, repackaging them to suite a desired outcome, while actions once taken are final.)

#### Preparing to begin the contest

What delayed the beginning of the contest of wall/counter-wall in the summer of 414 BC, almost one year after the launch of the Sicilian expedition in 415 BC? The launch of the Sicilian Expedition is held at the Piraeus harbour, the port of Athens. Thucydides describes a spectacle, filled with vocabulary taken from “agonistic and festival practice”.<sup>511</sup> Deborah Steiner, drawing on Hornblower, shows that the description of the narrative of the launch subverts the customary importance of the hoplite and cavalry in grand athletic games and public spectacles. Instead of focusing on the land army, the *trierarch* and the navy are thrust to the foreground.<sup>512</sup> The launch of the Athenian fleet is an impromptu ship-race. Thucydides calls it a contest (ἀμιλλαν) as far as Aegina (6.32.2). This detail “helps to set the agonistic tone of the two books”. Hornblower sees a thematic similarity with Pindar’s agonistic verse: “ships and chariots competing in swiftly wheeling contests (ἐν ἀμίλλαισι)” (*I.5.4-6*, cf. Aristophanes’ *Knights* 555-9).<sup>513</sup>

<sup>510</sup> In the case of words, the pace of speech and location, make little difference to the outcome, unless otherwise explicit.

<sup>511</sup> Steiner (2005) 411.

<sup>512</sup> Steiner (2005) 407-422; Hornblower (2004) 330-6, compares the launch to Pindar’s *Pythian 4* and the analogies between the Argo and a horse, effectively equating boats with steeds; Stahl (1973) 60-77.

<sup>513</sup> CT 3.394-5.

"Athenian attitudes toward horse-breeding and cavalry were ambiguous" <sup>514</sup>

At the Athenian assembly, held to decide the invasion, the generals Alcibiades and Nicias speak. Alcibiades brags of his many horse-chariot victories (6.16.2) and Nicias tries to defame him (6.15.2, *diabole*) noting that Alcibiades is a horse breeder (*hippotrophia*, 6.12.2), a person who was "thought to be ideologically suspect, of an elite group with oligarchic leanings". <sup>515</sup> (cf. 6.15.3) Nicias also notes the strength of the Syracusan cavalry (ἱππέων πολλῶν) but remarkably makes no request for cavalry, and merely for a large infantry (πεζὸν πολύν). <sup>516</sup> (6.21.1) Both men are chosen to lead the invasion of Sicily, making the prelude to this episode thematically about the cavalry's role in battle and in Athenian society. Looking forward toward the end of the expedition, following the sea battle in the Great Harbour, with the ultimate loss of walls and now the navy, Thucydides pathetically remarks that the Athenians retreated by land as "infantry instead of sailors", "relying more on hoplites than on a fleet" (7.75.7), signaling their folly in overlooking the importance of a complete field-army. A field army is primarily made up of light-armed soldiers, hoplites and cavalry. <sup>517</sup>

Preparations begin to take place after the Athenians send a herald to Syracuse to declare war (6.50.5). From then on, they spend their time preparing for a siege by land, which only begins with the seizure of Epipolae (6.97), almost one year later. <sup>518</sup> During the interval between declaration and seizure, the reader is repeatedly reminded of the weakness of the Athenian

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<sup>514</sup> CT 3.333-334, best exemplified in terms of social strata in Aristoph.*Knights* 498-610.

<sup>515</sup> CT 3.333.

<sup>516</sup> CT 3.357, "It is remarkable that Nikias does not actually ask for a large cavalry force, merely for a large infantry force to cope with the cavalry superiority of the enemy."

<sup>517</sup> van Wees (2004) 241, for the category of field-army as guards, hoplites and cavalry. The cavalry factor is a long noted theme of the Sicilian expedition esp. book 6: Kern (1999) 121-134; Stahl (1973) 60-77; Steiner (2005); Chief passages: 6.21.1, 22.1, 30-2, 63.3, 64.1, 67.1, 68.3, 70.3, 71.2, 74.2, 88.6, 94.5, 7.4.6, 11.2, 78.3, 81.2, 85.1.

<sup>518</sup> Allison (1989) 30-34 on the relation of *paraskeue* "preparation" as 'the process of preparing' at 6.65.1 as opposed to the product preparedness as the result of the process 'the state of preparation' at 6.91.2. Hermocrates had duly noted the difficulty of the Athenians to cross to Sicily with their whole *paraskeue* at 6.34.4. Allison argues for preparation as process all the way up to the moment the Athenians begin their siege by land: from the proclamation of the Athenians' decision to go to war (6.50.5) to the Athenians' seizure of Epipolae (6.97).

cavalry against the cavalry of the Syracusans (6.71.2)<sup>519</sup>. They come to Sicily without cavalry (οὐθ' ἵππους, 6.37.2, cf. 6.21.1). The Athenians' intention to lay siege to Syracuse was introduced in the second account of the first armament setting out from Athens.<sup>520</sup> The provision-bearing merchant ships which accompanied the fleet bore bakers, stone masons and carpenters and "all the tools for wall building" (ὅσα ἐς τειχισμὸν ἔργαλεῖα, 6.44.1).<sup>521</sup> But, who would do the building? The troops themselves would build the siege wall around the city. Building is difficult and dangerous. For this, a defensive cavalry is essential to fend off the besieged city's offensive cavalry attacks on sappers and workmen, who build and also collect stones and other materials (6.98.3-4, 99.1).<sup>522</sup> Aeneas Tacticus, the author of a military handbook, is particularly emphatic regarding the collection of resources for wall building. (37.2 cf. 2.2, 8.3, 32.2; 9, 33.4, 38.6-7, 40.1)<sup>523</sup> It seems the collection of material is so important that Nicias would rather forego an acquired strategic landing in the Great Harbour (6.64), than to attempt a siege without cavalry in the winter of 415.

During winter and in the following spring, the narrative formulaically describes the Athenian request and arrival of cavalry reinforcements. The Athenians request cavalry and money from Athens so that it may arrive in the spring (καὶ τριήρη ... τε χρήματα καὶ ἵππέας ... ἄμα τῷ ἥρι, 6.74.2). Syracusan reactions are detailed simultaneously. During that same winter,

<sup>519</sup> Cf. 6.69-71, The Athenians win first full scale battle with the Syracusans, but Syracusan cavalry keeps the Athenian infantry pinned down; also Nicias mentions the danger of Syracusan cavalry and the difficulty of supplying horses for the army 6.21.1, 22.1; Cavalry is seemingly absent from the launch 6.31, with a note that 300 cavalry had been included in the force to Potidaea; the presence of one horse transport with the fleet carrying 30 horses is mentioned later, in the second account of the armament, 6.43 (a technique called narrative postponement, meant to emphasize their absence in the first account).

<sup>520</sup> It is of note that siege is not mentioned explicitly as part of the plan in the council of generals, 6.47-49. It was a strategy that needed to be rejected for the moment, as they find they have very limited support from Segesta, and thus are concerned primarily with acquiring forces and resources.

<sup>521</sup> Allison (1995) 16, notes that "at no point in the planning stages is a wall for the camp discussed, but neither is any precise strategy for the fleet".

<sup>522</sup> Eur. *Ph.* 732-3; van Wees (2004) 126; Kern (1999) 124, notes how the Athenians were "well-equipped for wall building" but "needed cavalry to protect their sappers against ... the Syracusan cavalry".

<sup>523</sup> Aeneas tells us at 8 that part of his treatise "Preparations for Defence" discusses the articles left outside the city for wall-building. Sadly the treatise does not survive.

the Syracusans extend the length of their wall so that they would not be walled-off at close quarters, should they be defeated in battle (Ἐτείχιζον ... ἐν τῷ χειμῶνι ... τεῖχος παρὰ πᾶν ... ὅπως μὴ δι' ἐλάσσονος εύαπποτείχιστοι ὥσιν, ἢν ἄρα σφάλλωνται, 6.75.1) The Athenians then sent orders to various Sicel tribes and to Segesta to send as many horses as possible (πέμψαντες ἐκέλευον ἴππους σφίσιν ὡς πλείστους πέμπειν), and only now we are told formally that the Athenians by collecting wall-building material intend to circumvallate Syracuse in the spring (καὶ τἄλλα ἐς τὸν περιτειχισμόν, πλινθεῖα καὶ σίδηρον... καὶ ὅσα ἔδει ... ἄμα τῷ ἥρι, 6.88.6). In the spring, a cavalry detachment and money arrive from Athens (Αφίκετο ... τε χρήματα καὶ ἵππεας ... Ἄμα δὲ τῷ ἥρι), albeit without horses (ἀφικόμενοι ... τούς τε ἵππέας ἥκοντας ... ἄνευ τῶν ἵππων μετὰ σκευῆς, 6.93.4; 94.1; 94.4). Not long after, the Athenians purchase horses and the Segestans and Catanaians provide horses. The Segestans, Sicels and Naxians also bring more cavalrymen (καὶ οὐ πολλῷ ὕστερον ... ἵππης ... ἴππους τοὺς μὲν ..., τοὺς δ' ἐπρίαντο, 6.98.1-2). The Athenians now invade Syracusan territory and begin building (ἐτείχισαν τὸν κύκλον, 6.98.2). The Syracusans react by sending a part of their cavalry to prevent them from collecting stones and placing them along the way for building (μέρους τιὸς τῶν ἵππεων ... ἐκώλυον τοὺς Ἀθηναίους λιθοφορεῖν τε καὶ ἀποσκίδνασθαι μακροτέραν, 6.98.3). The Athenians send out their entire cavalry and a battle ensues. They repel the Syracusan cavalry and win the cavalry battle (τροπαῖον τῆς ἵππομαχίας ἔστησαν, 6.98.4)<sup>524</sup> allowing the Athenians to secure the outskirts and begin their circumvallation.

A cavalry capability is a requirement for the *agon* as siege, and the *Wall/Counter-wall* episode only begins in the spring with the arrival of the Athenians' requested cavalry and money. Note that the reader hears about the Athenian plan of circumvallation from the Syracusans first

<sup>524</sup> Athens had about half the number of cavalry as the Syracusans: 650 to 1200 cavalry. (6.98.1) The reader is made to disregard the disparity in the number of cavalry, since Syracuse's number is given over 30 chapters before. (6.67.2) The number of Athenian cavalry levied is said "not to be in every way inferior in cavalry" to the Syracusan and thus suggests parity, as opposed to the actual disparity and the actual surprising Athenian victory in the cavalry battle.

(εύαποτείχιστοι ὡσιν, 6.75.1). Later, when the Syracusans receive news of the cavalry reinforcement (ώς ἐπύθοντο τούς τε ἵππέας ἥκοντας), they expect an imminent attack (μέλλοντας ἥδη ἐπὶ σφᾶς ιέναι, 6.96.1) and make preparations for an Athenian walling-off operation (ἀποτείχισθῆναι). According to Thucydides' narrative description, the Athenians had neither received cavalry reinforcements nor invaded Syracusan territory, and yet the Syracusans were already preparing for a circumvallation wall. Both mentions of the Syracusans' anticipation of an Athenian circumvallation wall are immediately preceded in the narrative by the Athenian request for cavalry (6.75) and the cavalry's arrival (6.96).<sup>525</sup> This reveals common knowledge of the necessity of cavalry for siege.

### The Race of Wall/Counter-wall (6.99 - 7.6)

The arrival of the Athenian cavalry reinforcement signal to the Syracusans that the Athenians are now prepared to lay siege. The Syracusans now gather to discuss how to secure the highest point nearest the city, Epipolae, the best position from which to protect them from a siege. (6.96)<sup>526</sup> Epipolae is a strategically superior location to deploy troops both to the southern and northern fronts surrounding Syracuse. (6.97) Nonetheless, while the Syracusans are preparing to ascend Epipolae, the Athenians take Epipolae first (6.97.2).

### The board

The city and its environs restrict the board. The delay of the cavalry reinforcements had granted the Syracusans time to build an extension wall,

<sup>525</sup> How the Syracusans knew of the request, is a matter I do not discuss. Grote HG 6.61 is right to assume that the Syracusan generals had been elected in the winter and that the winter wall was their "most important measure" after nomination. Thucydides tells us of their nomination in the spring at the beginning of the wall/counter-wall building, this is an analepsis or "flash back". Thucydides places their nomination later in the narrative, emphasizing their status as the players, in order to introduce the wall/counter-wall game and leaving behind the preparatory measures.

<sup>526</sup> See 6.75.1, note that Epipolae has already been mentioned before, but is not extensively introduced as it is here at 6.96, since it's strategic significance is relevant here and not then.

making any attempt at circumvallation more difficult. (6.75.1) During the winter of 415, the Syracusans built an extension from the little harbour in the South to Trogilos on the sea to the North. This wall, otherwise known as the Winter Wall,<sup>527</sup> would force the Athenian besiegers to build further than before. The board is geographically bound to the outskirts of this Syracusan Winter Wall.

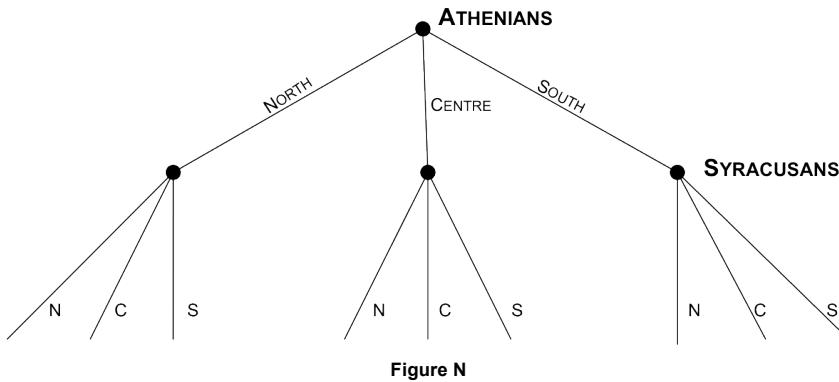
The geography of the outskirts of the Winter Wall determines the possible location of their circumvallation wall running North to South. There are the cliffs at the centre, flanked to the North by a plateau leading to Trogilos and to the South by a marshy plain leading to the Great Harbour. The Athenians make the first move. They take the highest ground called Epipolae where the cliffs are above the city. This front faces the centre of the Winter Wall, at the point at which it goes around a sacred precinct.<sup>528</sup> Given the three topographical terrains, the possible actions for the first mover were three, the North, Centre and South, and likewise for the counter mover. In the first stage of construction, the Athenians have three fronts to choose from and the Syracusans then respond building on any of their three fronts, as well (figure below: ). Each phase of construction is dominated by this **two-stage** scenario. The graphic representation of a game with a time aspect is a tree-route-like drawing called extensive form. The extensive form specifies order of play.<sup>529</sup>

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<sup>527</sup> Dover (1965) 79; HCT iv 466–484, especially 471–473 for “Syracusan Wall of Winter 415/14”, for a thorough discussion/sources of the topography of Syracuse. Further sources on topography: Lazenby (2004) 144ff.; esp. CT 3.489, 523, 528 contra Drögmüller (1969).

<sup>528</sup> HCT iv 472, 476.

<sup>529</sup> The matrix drawn for simultaneous move games is called normal form, and it does not specify order of play.



Given the Athenians must build on all three fronts to complete circumvallation, with three phases of construction, this tree extends to over seven hundred possible outcomes (at least  $3^6 = 729$ ).<sup>530</sup> If this were all the information we could extract from the narrative of this dynamic interaction, all outcomes would be equally possible. As we have seen before, thankfully, players have preferences over actions. These preferences will lead us to a ranking of outcomes.

### Players, Actions and Preferences

#### Players

The problem faced by the generals on both sides in this siege is a deployment problem. Thucydides writes that troops would “be deployed either to fight or to build” (προσίοιν ἢ μαχούμενοι ἢ τειχιούντες, 6.97.5). The generals must decide how troops are to be deployed. The Athenians are led by the generals Nicias and Lamachus, while the Syracusans are led by

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<sup>530</sup> “At least” refers to the minimum three sets of move/counter-moves to complete circumvallation from the perspective of the Athenians. This tree allows for up to three constructions on the same front and does not envisage more move/counter-moves as Thucydides’ original setup suggests.

Hermocrates and his colleagues, who had just taken office.<sup>531</sup> Players are referred to in the narrative as “the Athenians in Sicily” and “the Syracusans”, thus *οι ἐν τῇ Σικελίᾳ Ἀθηναῖοι* and *οι Συρακόσιοι*. (1: 6.94.1/97.1; 2: 96.1) With respect to Syracuse it seems we are meant to keep Hermocrates in mind as the principal decision-maker, as he is the one to propose the counter wall strategy. (6.99.2) When Hermocrates is deposed, Gylippus takes command.<sup>532</sup> (6.103.4) With respect to the Athenians, there is a shift in command from joint generalship to Nicias alone (6.103) with the death of Lamachus (6.101.6).

### Actions

Building and fighting are competitive. The Athenians “intend to attack” and the Syracusans “intend to defend” themselves ([A.s] μέλλοντας ... ιέναι, [S.s] διενοοῦντο ... φυλάσσειν, 6.96). For de Romilly, the two most important actions for Thucydides are victory in battle and wall-building (κρατεῖν and ἀποτειχίζειν). The phrases which bracket this episode use both these words in the same relationship to make the reader perceive the rigor of his correspondence between introduction and conclusion.<sup>533</sup>

Before circumvallation begins:

οὐκ ἀν ἥρδίως σφᾶς, ούδ' εἰ κρατοῖντο μάχη,  
ἀποτειχισθῆναι

Even if the Athenians were victorious in battle, they  
could not easily wall them off (6.96)

<sup>531</sup> The Syracusans elect the general “Hermocrates and his colleagues”. (6.96.3). Whether the Syracusan generals were voted *strategoi autokratores* “executive authority” as Hermocrates had advised (6.72.5) is not stated, CT 3 ad loc.

<sup>532</sup> We hear of Gylippus first when the Spartans decide to send aid to Sicily (6.93) and again only immediately after the Syracusan generals are deposed (6.104). This is to emphasize the interregnum limbo of the newly elected Syracusan generals and the ultimate shift of leadership in the Syracusan camp from Hermocrates to Gylippus.

<sup>533</sup> de Romilly (1956) 34.

After circumvallation ends:

έκείνους τε καὶ παντάπασιν ἀπεστερηκέναι, εἰ καὶ κρατοῖεν, μὴ ἀν ἔτι σφᾶς ἀποτειχίσαι

Even if the Athenians were victorious in battle, they were utterly deprived of all hope of walling them off (7.6)

In this episode, fighting and building are intertwined. Usually described as a race, which it is on a *macro* scale. On a *micro* scale, it is a repeated **dueling of walls and counter-walls**. Both sides at an apparently constant rate<sup>534</sup> build toward a point of intersection in the attempt to overtake the other's wall. De Romilly helps us to see that in fact there were three duels or three phases of building and fighting.<sup>535</sup>

## Preferences

The Athenians intend to build their walls efficiently, as quick and as short as possible.<sup>536</sup> The circumvallation wall (τὸ ἀποτείχισμα) will extend the full length of the city by land, from South to North *in the direction of the shortest route* (ἡπερ βραχύτατον) around Syracuse.

καὶ τῇ ὑστεραίᾳ οἱ μὲν ἐτείχιζον τῶν Αθηναίων τὸ πρὸς βορέαν τοῦ κύκλου τεῖχος, οἱ δὲ λιθους καὶ ξύλα ξυμφοροῦντες παρέβαλλον ἐπὶ τὸν Τρωγίλον καλούμενον αἱσεί, **ἡπερ βραχύτατον** ἐγίγνετο αὐτοῖς ἐκ τοῦ μεγάλου λιμένος ἐπὶ τὴν ἐτέραν θάλασσαν τὸ ἀποτείχισμα.

On the next day, some of the Athenians were building the wall to the north side of the circle fort, while others worked continuously gathering rocks and timber and placing them along a line to a place called Trogilus, ***in the direction which would give them the shortest route for their circumvallation wall from the great harbour to the sea on the other side.*** (6.99.1)

<sup>534</sup> de Romilly (1956) 35.

<sup>535</sup> de Romilly (1956) 54.

<sup>536</sup> Often noted point about Athenian speed Rood 171-173 "what T. stresses is the speed of the Athenians' fortification"(cf. 6.98.2, διὰ τάχους) but also Syracusans fighting (6.101.6: εὐθὺς κατὰ τάχος, 102.4: κατὰ τάχος).

We will see that intention is matched by their actual building.<sup>537</sup> The explicit initial intention of the Athenians is to complete the circumvallation and for the Syracusans to prevent circumvallation by matching the actions of the first mover.<sup>538</sup> After Thucydides' description of the Athenians' intention, the Syracusans opt for a counter-wall strategy. Thucydides describes the Syracusans thinking about where to build counter-walls and what the Athenians would do given a counter-wall strategy. Hermocrates argues that they will require only a portion of the army to fight, as opposed to their current, more risky strategy, of multiple attacks with their whole army. The counter-wall strategy requires that *the Syracusans build on the same front on which the Athenians build*. In this way, both armies will divide their time between fighting and building, which will delay Athenian construction and, if they reach the intersection first, prevent circumvallation completely. I quote Hermocrates' reasoning below in full.

οἱ δὲ Συρακόσιοι οὐχ ἥκιστα Ἐρμοκράτους τῶν στρατηγῶν ἐσηγησαμένου μάχαις μὲν πανδημεὶ πρὸς Ἀθηναίους οὐκέτι ἔβούλοντο διακινδυνεύειν, **ÚΠΤΟΕΙΧΙΖΕΙΝ** δὲ ἄμεινον ἔδόκει εἶναι, **ἢ ἔκεινοι ἔμελλον ἄξειν τὸ τεῖχος** καὶ, εἰ φθάσειαν, ἀποκλήσεις γίγνεσθαι, καὶ ἄμα καὶ ἐν τούτῳ εἰ ἐπιβοηθοῖεν, **μέρος ἀντιπέμπειν** αὐτοῖς τῆς στρατιᾶς καὶ φθάνειν αὐτοὶ προκαταλαμβάνοντες τοῖς σταυροῖς τὰς ἐφόδους, ἔκείνους δὲ ἀν παυομένους τοῦ ἔργου **πάντας** ἀν πρὸς σφᾶς τρέπεσθαι.

Guided especially by Hermocrates, among the generals, the Syracusans wished no longer to risk battle in full-force against the Athenians, but instead they considered it better [that the Syracusans] *build a counter wall in the direction [the Athenians] intended to carry their wall*. So, if they outstripped them to it, the Athenian wall would be cut off. At the same time, if the Athenians should send reinforcements during the building, [the Syracusans] would deploy part of their

<sup>537</sup> Gomme HCT iv. 474, objects to Thucydides' historical accuracy regarding the shortest route, as "geometrical precision in the interpretation of 'shortest' is out of place, since any point in that region could be described as the terminus of the 'shortest route'", which lends further strength to my argument that Thucydides intentionally represents his players making optimal moves.

<sup>538</sup> This is the general consensus. Allison (2005) *contra*, reads the construction as intended only around the Athenian camp. It is not correct to say that the Athenians did not ever intend full circumvallation.

army against them and themselves [i.e. the Syracusans] get ahead of the Athenians by occupying the approaches with their palisade. The Athenians would thus stop their work and all together turn against [the Syracusans]. (6.99.2)<sup>539</sup>

According to the Syracusan focalization, Hermocrates has proposed a strategy of counter-wall building,<sup>540</sup> which predicts that if one army begins to build, the other may continue building their wall or may stop building to fight and attack the other's wall. This implies that either side may opt to attack the other's construction in full force, in partial force, or not to attack at all. Hermocrates argues that partial force will help them reach the intersection first. It is implicit that the fighting-offensive could be either full, partial or none, and explicit that the building-defensive prefers to respond by

<sup>539</sup> Notoriously contorted passage, CT 3.529 Hornblower notes that the "focalization gets complicated" about the Syracusan reasoning about the Syracusan reasoning about the Athenian reasoning and reaction. Particularly difficult with respect to Thucydides' use of "they." Dover ad loc.; Gomme, Andrewes HCT ad loc. Anacoluthon occurs since the subject is always *Syracusans* until it shifts subject, but is only noticed at οὗτοῖς, which retrospectively turns the subject of the second hypothetical (εἰ ἐπιβοηθοῖεν, cf.100.1) into the Athenians. Dover (1965) 97-98, in his commentary connects the subject of the main clause ἀποκλήσεις of the first hypothetical statement (εἰ φθάσειαν, ἀποκλήσεις γίγνεσθαι) with ἔμελλον. This is the explanation for the Athenians as subject of the hypothetical. The subject could also be the Syracusans or, because of the mischievous anacoluthon an indefinite or general statement with εἰ + optative instead of ἔάν + subjunctive (as we see in Euclid's Common Notion 3, or as Thucydides himself does at 8.66.2, εἰ δὲ τις ἀντείποι, ... ἔτεθνήκει). Dover does notice this indefiniteness suggesting the passage implies "wherever they manage to build a wall, we will intercept it". Still, all translations since Hobbes assume the Athenians are the subject.

<sup>540</sup> The Syracusans, deciding not to risk any more general engagements, are "like the Athenians themselves in 431". Hermocrates' plan of wall/counter-wall seeks to lead the Athenians to stop construction and thus attack the Syracusan Winter Wall in full-force. If this were to happen, the Athenians would be forced to stop construction, while the Syracusans still control the surrounding sea (6.99.4). The Athenian army settled upon Epipolae (6.97.5; καθεζόμενοι... 6.98.2) creates confusion. This reminds us of Archidamos' plan in the *First Invasion of Attica*. (See Chapter 1) Here, Hermocrates' plan must stop the siege (i.e. the circumvallation wall) and force the Athenians in Sicily to restrict their camp only upon Epipolae in full view of Syracuse, which is "immediately above the city" and "completely visible from inside" (ύπερ τῆς πόλεως εύθυς κειμένου... **ἐπιφανές πάνταν ἔσω**, 6.96.1-2), instead of building on all fronts. The winter wall was built with the intention to keep the Athenians within sight yet far enough that it would be difficult to hold them under siege, even if they should be defeated in battles (Ἐτείχιζον ... πρὸς τε τῇ πόλει ... **τείχος παρὰ πάντα τὸ πρὸς τὰς Ἐπιπολὰς ὥρων**, ὅπως μὴ δι' ἐλάσσονος εὐποτείχιστοι ὡσιν, ἦν ἄρα σφάλλωνται, 6.75.1). This environment is similar in some ways to the one faced by Archidamos, who set up camp at Acharnae, expecting the whole army to come out, since it was in full view of Athens (τοὺς πάντας ἐς μάχην ... ἐν τῷ ἐμφανεῖ, 2.20.4, 21.2). The main difference is that, because of the delay, the Athenians did not have a great enough effect of shock upon the Syracusans to make them fall into stasis. Later, Demosthenes explicitly regrets this foregone tactic. As long, as the Syracusans do not come out to fight, they are better off as an "island state" living off her maritime channels, than trying to fend off the Athenian army with full-force battles.

matching the building-offensive's chosen front. Hermocrates argues that fighting during construction is less risky for the defence player.

We can somewhat confidently hypothesise that the objective of the Athenians is to complete all three fronts, by either building and reaching the intersect first or fighting and tearing down a Syracusan counter-wall. The Syracusan objective is to complete at least one of the counter-walls to prevent circumvallation. If the Syracusan army should divide the deployment between fighting and building, they would build further. This is because the Athenians have a dominant strategy to reply by deploying their whole army, which consequently stops building. In the following description of the interaction, it is of note that imperfects are used to signal ongoing constructions while aorists signal finished constructions. I assume these tenses indicate pace of completion. Pace will help us to compare the length of the construction on either side, given that neither side appears to have a significantly more efficient building technique than the other.

Chris 24/3/16 23:54

Comment [5]: Doesn't Rood ask why?

Manuela Dal Borgo 30/6/16 13:55

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In fighting, deploying part of the army is a weakly dominated strategy, given the Athenians prefer to attack in full force or not at all. A weakly dominated strategy is a strategy that is inferior *most of the time* to whatever the other player does. It is the inverse of a weakly dominant strategy (See Chapter 1). Hermocrates may or may not have considered the Athenian intention to restrict attacks to full force. Should the Syracusans deploy a portion of their army, the Athenians win, most likely, in full force and draw in partial force. What is meant by 'draw' is a stale-mate and that either player is equally likely to win. Therefore, the Syracusans using Hermocrates' strategy face likely defeat or a draw. Let us check to see if the Syracusans and Athenians act according to their intentions in the narrative.

### Phase One of Wall/Counter-wall (6.98.2 - 100)

The Athenians were first to take Epipolae and there they quickly built a circle fort (**έτείχισαν** τὸν κύκλον διὰ τάχους, 6.98.2), which they began to

extend toward the North (οἱ μὲν ἐτείχιζον τῶν Ἀθηναίων τὸ πρὸς βορέαν τοῦ κύκλου τεῖχος, 6.99.1). Their action corresponds with their initial intention to build *in the direction of the shortest route* (ἡπερ βραχύτατον ἐγίγνετο αὐτοῖς, 6.99.1). The Syracusans now respond according to their preferences, or optimally, by matching. They begin to build a counter-wall radiating from the centre of the Winter Wall at a right angle, toward just below the circle fort.

The Syracusans came out of the city and began the building work (ἐτείχιζον). They started the counter-wall from their city and ran it up from below at a **right angle** to the Athenian circle fort, (ἀπὸ τῆς σφετέρας πόλεως ἀρξάμενοι, κάτωθεν τοῦ κύκλου τῶν Ἀθηναίων ἐγκάρσιον τεῖχος ἄγοντες) cutting down olive trees in the precinct and setting wooden towers in the wall. ... The Athenians did not come out to impede the work, fearing that if their forces were divided (δίχα) they would be more vulnerable in any fighting, and they were in any case intent on pushing on with their own work on the circumvallation wall (καὶ ἅμα τὴν καθ' αὐτοὺς περιτείχισιν ἐπειγόμενοι, 6.99.3).

While the Syracusans build, the Athenians also prefer to build rather than risk dividing their forces to attack the Syracusan construction. When the Syracusans eventually stop construction, the Athenians also stop and immediately begin a full army offensive. The Athenians prefer to stop construction, when the Syracusans do. On the offensive, the Athenians “destroyed the pipes that brought drinking water” into Syracuse. When all the Syracusans had retreated into the city and were relaxed in their guard of the counter-wall, the whole Athenian army attacked the stockade and tore down the counter-wall.<sup>541</sup>

The whole army (ἡ πᾶσα στρατιὰ) then went back, destroyed the counter-wall, ripped up the stockade, carried off the stakes for themselves and set up a trophy. (6.100.3)

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<sup>541</sup> HCT v.475-476 with map 3, explains exactly how the Athenian army attacked the counter-wall by deploying different sections of the army south, west (straight for the counter-wall) and north-east of the circle fort.

The Athenians prefer to fight only when their whole army does not need to be building, otherwise they will continue to build the circumvallation wall. The Athenians need to build when the Syracusans build, and both need to fight if not building, in the hope of tearing down the other's ongoing construction, as the Athenians did here in the first phase.

Hermocrates believed that "if the Athenians should attack during their building, [the Syracusans] would deploy part of their army against them and themselves [i.e. the Syracusans] get ahead of the Athenians by occupying the approaches with their palisade (εἰ ἐπιβοηθοῖεν, μέρος ἀντιπέμπειν αὐτοῖς τῆς στρατιᾶς καὶ φθάνειν αὐτοὶ προκαταλαμβάνοντες τοῖς σταυροῖς τὰς ἐφόδους, 6.99.2)." Hermocrates thought that they could pin down the Athenians with part of their force while the rest of their force builds. It was a consideration the Athenians themselves had made and considered suboptimal to win battles. The Athenians deploy part of their army to the city's Winter wall, **if the Syracusans should attack** (εἰ ἐπιβοηθοῖεν, 6.100.1), and **the other part** to tear down the Syracusan palisade in construction. The Athenians alter Hermocrates' strategy into a full army offensive, of both fighting and taking down the Syracusan construction, rather than building and fighting. The Athenians win the battle and the counter-wall is destroyed.

### Phase Two of Wall/Counter-wall (6.101-102)

On the following day, the Athenians begin construction (ἐτείχιζον) of the southern front of the circumvallation wall from the circle fort (ὅς τῶν Ἐπιπολῶν ταύτη πρὸς τὸν μέγαν λιμένα ὄρδη, 6.101.1). This part of the **circumvallation wall** is again optimal as it is being built *in the direction of the shortest route* toward the great harbour (ἡπερ αὐτοῖς βραχύτατον ἐγίνετο) through the marches (καταβᾶσι διὰ τοῦ ὁμαλοῦ καὶ τοῦ ἔλους ἐς τὸν λιμένα **τὸ περιτείχισμα**, 6.101.1-2) The Syracusans again (αὖθις) respond optimally building to intercept the Athenians at the middle of their wall as follows:

καὶ οἱ Συρακόσιοι ἐν τούτῳ ἔξελθόντες καὶ αὐτοὶ **ἀπεσταύρουν αὐθίς** ἀρξάμενοι ἀπὸ τῆς πόλεως **διὰ μέσου τοῦ ἔλους**, καὶ τάφρον ἄμα παρώρυσσον, ὅπως μὴ οἴον τε ἢ τοῖς Ἀθηναίοις **μέχρι τῆς θαλάσσης ἀποτείχισαι**.

Meanwhile the Syracusans came out and started again to **build a stockade** running from the city through the middle of the marsh; at the same time they dug a ditch to prevent the Athenians continuing their wall all the way to the sea.

The Athenians begin to build in the direction of the marshes and the Syracusans match. This counter-wall (palisade and ditch) intends to prevent the Athenian wall running south to the great harbour. Again (αὐθίς) the Athenians attack the counter-wall (palisade and ditch, 6.101.3) in full force.<sup>542</sup> We can assume the Syracusans deployed only a portion of their army. A battle ensues and the Athenians are again victorious, yet Lamachus is killed. (6.101.4 – 103.1) The first two phases of wall/ counter-wall building is described with considerable repetitions - building is followed by fighting - which de Romilly calls a “permanence of the same intention”.<sup>543</sup>

### Summary of Preferences

Up to this point, actions are consistent with preferences. This is a typical Thucydidean narrative technique, where preferences are inferred from actions. In game theory and in economics this way of thinking about preferences is called the *principle of revealed preferences*, wherein a player reveals his *a priori* preferences over the available outcomes through his observable choice. Thucydides deduces motivation from a player's action, and then builds the structure of the interaction to lead up to this action.<sup>545</sup>

Chris 24/3/16 23:57

Comment [6]: Footnote seems highly convoluted. Do you need it?

Manuela Dal Borgo 30/6/16 14:00

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<sup>542</sup> We are not told that the whole army of the Athenian was deployed, however the formation is identical to the previous deployment. It is divided into the 300 picked contingent, a left wing and right wing. The Syracusans are divided in a contingent deployed to the circle fort and in a right wing and left wing.

<sup>543</sup> De Romilly (1956) 35.

<sup>545</sup> It is unlikely Thucydides had any information regarding the Syracusan planning of the counter-wall strategy.

When building-offense begins, the defence matches, and when the building ceases, the fighting-offense attacks with in full force. The defence which fights and builds simultaneously loses the battle. Both players prefer to build when the other is building and fighting leads to a Syracusan defeat in battle, since the Athenians reveal that dividing their army between building and fighting is a dominated strategy. The difference in preferences is in the allocation of troops for building. The offense is the first mover. Here, the first to take Epipolae. The first mover has autonomy, the defence must match. While the defence prefers to build on the same front on which the offense builds, the offense changes fronts and prefers to build on a front that does not already have a wall. This preference relation is reasonable for an Athenian offense if the objective is to complete the circumvallation of Syracuse.

### Phase Three of Wall/Counter-wall (6.103 – 7.6)

Phase three is the longest description of the events which took place during siege. This is a result of shifting command and Thucydides' digressions on the strategic 'mistakes' made by both players. For this reason this phase is explored carefully regarding the motivations behind the Athenians' move and that of the Syracusans after these command shifts.

#### Shifting Strategies (6.103 – 7.1)

Thucydides during the phase two battle interjects forcefully that Nicias happened to fall sick. (ἔτυχε γὰρ ἐν αὐτῷ δι’ ἀσθένειαν ὑπολελειμμένος, 6.102.2) From this point on there is a shift in strategy and in command. The Athenian plan of action shifts from circumvallation to a **double wall** (**τείχει διπλῶ**, 6.103.1) in the south, instead of continuing the single wall through the marshes. Command also shifts to Nicias' solitary command, after the death of Lamachus. (οὗτος γὰρ δὴ μόνος εἶχε Λαμάχου τεθνεῶτος τὴν ἀρχὴν. 6.103.4)

The Syracusans also undergo a shift in command and strategy. The whole army retreats into the city (ἢ ξύμπασα στρατιά, 6.102.4), building and fighting ceases, and there is a leadership stagnation.

αἱ γὰρ οἱ Συρακόσιοι πολέμω μὲν οὐκέτι ἐνόμιζον ἂν περιγενέσθαι, ὡς αὐτοῖς ούδε ἀπὸ τῆς Πελοποννήσου ὡφελία ούδεμίᾳ ἥκε, τοὺς δὲ λόγους ἐν τε σφίσιν αὐτοῖς ἐποιοῦντο ξυμβατικούς καὶ πρὸς τὸν Νικίαν: οὗτος γὰρ δὴ μόνος εἶχε Λαμάχου τεθνεῶτος τὴν ἀρχὴν. **καὶ κύρωσις μὲν ούδεμίᾳ ἐγίγνετο, οἷα δὲ εἰκὸς ἀνθρώπων ἀπορούντων καὶ μᾶλλον ἢ πρὸν πολιορκουμένων**, πολλὰ ἐλέγετο πρός τε ἐκεῖνον καὶ πλειώ ἔτι κατὰ τὴν πόλιν. καὶ γάρ τινα καὶ ὑποψίαν ὑπὸ τῶν παρόντων κακῶν ἐξ ἀλλήλους εἶχον, καὶ τοὺς στρατηγούς τε ἐφ’ ὃν αὐτοῖς ταῦτα ξυνέβη ἔπαισαν, ὡς ἢ δυστυχίᾳ ἢ προδοσίᾳ τῇ ἐκείνων βλαπτόμενοι, καὶ ἄλλους ἀνθείλοντο, Ἡρακλείδην καὶ Εύκλεα καὶ Τελλίαν.

The Syracusans no longer expected to prevail in the war since no help had reached them, even from the Peloponnese; indeed all the talk amongst themselves was of coming to terms, and they were saying this also to Nicias, who now had sole command after the death of Lamachus. **There was no resolution, but as it is expected from men in an impasse (aporia) and being besieged even more than before**, many options were being proposed to him and even more still to the city. Indeed they nourished a certain suspicion of each other under the present misfortunes, and deposed the generals under whose command these things had befallen them, assuming they were being harmed by the generals' bad luck or treason on their part. They appointed others, Heracleides, Eucles and Tellias. (6.103.3-4)

The Northern front is now free for a counter-wall to go up, and prevent circumvallation, but the Syracusans are stunned into inaction (κύρωσις μὲν οὐδεμίᾳ ἔγιγνετο). They harbour suspicion for one another and depose the sitting generals, with whom the counter-wall strategy could move forward. The Syracusans change their strategy to that of **negotiating** surrender (**τοὺς δὲ λόγους** ἐν τε σφίσιν αὐτοῖς **έποιοῦντο** ξυμβατικοὺς καὶ πρὸς τὸν Νικίαν, 6.103.3, cf. see Melian Dialogue for how Thucydides describes a **negotiation**).

The arrival of the Athenian fleet in the great harbour caused the Syracusans to **believe they could no longer prevent the southern circumvallation wall** (νομίσαντες μὴ ... κωλῦσαι τὸν ἐπὶ τὴν θάλασσαν τειχισμόν., 6.102.4), and since no assistance had arrived from the Peloponnese, that they would generally not prevail in the war (οὐκέτι ἐνόμιζον ἀν περιγενέσθαι, 6.103.3).<sup>546</sup> Aid poured in from Sicily and Italy for the Athenians (6.103.2). The Syracusans begin negotiations with Nicias to surrender Syracuse and, discharging Hermocrates and the other generals, elected new ones (6.103.4).

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<sup>546</sup> νομίσαντες μὴ ἀν ἔτι ἀπὸ τῆς παρούσης σφίσι δυνάμεως ἵκανοι γενέσθαι κωλῦσαι τὸν ἐπὶ τὴν θάλασσαν τειχισμόν, 6.102.4; καὶ γάρ οἱ Συρακόσιοι πολέμω μὲν οὐκέτι ἐνόμιζον ἀν περιγενέσθαι, ὡς αὐτοῖς οὐδὲ ἀπὸ τῆς Πελοποννήσου ὥφελία οὐδεμίᾳ ἤκε, 6.103.3.

The promised Peloponnesian aid under the command of the Spartan Gylippus was on its way to Syracuse, but this fleet is cast off course by false reports and also by a storm (6.104). There follows a chronological note on the events in Greece (6.105), and then we move back in the narrative to the Peloponnesian fleet and its long awaited arrival (7.1-2). The Spartan delay was caused by misinformation. Because of false reports, the Spartans believed Syracuse to have been completely circumvallated, and therefore lost. (ώς ἦδη παντελῶς ἀποτετειχισμέναι αἱ Συράκουσαι εἰσι 6.104.1) Only later, do the Spartans receive a reliable report that the Syracusans had not at all been completely circumvallated (ὅτι οὐ παντελῶς πω ἀποτετειχισμέναι αἱ Συράκουσαι εἰσιν), and that the Spartans could still come to the aid of Syracuse via Epipolae in the North (7.1.1), which was unfinished (ἡμίεργα, 7.2.4). Thucydides drives in this blatant Athenian relapse in the North, and writes “So close did the Syracusans come to destruction” (παρὰ τοσοῦτον μὲν αἱ Συράκουσαι ἥλθον κινδύνου, 7.2.4).

### Summary of Preferences

The clear phases with optimal responses by both players in phase one and two of the wall/counter-wall contest appears to dissolve in the third phase. We find ourselves at this point in the narrative with a second wall being built to the south. This will lead to a type of outcome that is called an **off-equilibrium path outcome**, where a player apparently irrationally deviates from his preferences and does not act in his own best interest, in this case losing the game. The Athenians instead of responding optimally and completing circumvallation to the North, build a second wall to the South. Likewise the Syracusans instead of responding optimally and building on the unfinished front to the North, are perplexed by their immediate misfortunes, replace the incumbent generals and thus change their strategy to one of negotiation. Thucydides here elucidates the issue for game theory on the subject of players going ahead with suboptimal strategies. What may appear to be an *irrational* move for game theorists is actually a change of strategy, due to an abandonment of the original game, in order to pursue

another objective not represented by the original set up. Given Syracuse's current desire to negotiate, Nicias abandoned circumvallation.

### Wall/Counter-wall Resumed (7.2- 7.6)

Negotiations with Nicias cease with the arrival of the Spartan generals Gongylus and Gylippus (7.2). The Athenian Northern wall is unfinished and because of Nicias' delay, spending resources on a double wall, Gylippus seizes the Athenian fort in the North at Labdalum and begins to build a counter-wall (7.4.1). Nicias continues to build elsewhere in the environs of Syracuse (7.4.2-4.7), as Gylippus advances the counter-wall (7.5). Finally Nicias can no longer overlook this and the final *race of the wall* begins in the North (7.6).

Gylippus recovers Hermocrates' strategy. Gylippus draws up part of the Syracusan army in front of the Athenian walls, so that they would not be able to send reinforcements (μὴ ἐπιβοηθοῖεν, 7.3.4), and deploys the remainder of the army to take Labdalum in the North. Much like the Athenians taking Epipolae first, just as the Athenians had first done (ἥπερ καὶ οἱ Αθηναῖοι τὸ πρῶτον, 7.2.3) Gylippus now steals the first mover advantage away from the Athenians. After Gylippus seizes the Northern front, the Syracusans redeploy the original counter-wall strategy, building in the North a single wall at a right angle starting from the city up through Epipolae (ἐτείχιζον ... δία τῶν Ἐπιπολῶν ἀπὸ τῆς πόλεως ἀρξάμενοι ἄνω πρὸς τὸ ἐγκάρσιον τεῖχος ἀπλοῦν, 7.4.1) Thucydides' emphasis that this was a single wall tells the reader exactly what the original game entailed: one wall on each front.<sup>547</sup>

### Duels

The wall/counter-wall interaction in its simplest structure is as a *repeated two-stage game, with three phases*. What about the interaction within each

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<sup>547</sup> Nicias in his letter also mentions the "single wall" (7.11.3)

individual building and fighting phase? Counter-wall building requires that the second mover reply by building on the same front as the first mover. This is done in order to intercept the wall of the opponent.

On both sides, wall building in each phase appears to move forward at a **constant pace**. In order for the Athenians to win, i.e. successfully circumvallate Syracuse, they must intercept the Syracusan counter-walls three times, whereas the Syracusans may fail two out of three attempts and still intercept the Athenian wall.

Each attempt is much like a **duel**, two opponents walk towards each other at a given **pace** and must decide **when** to shoot. If neither shoots, chance decides who lives or dies when they meet at the **middle** (i.e. **the intersection of the walls**). Both players, especially the Athenians, launched numerous attacks while building their walls. In the analogy of the duelists, it is as if each duelist has an unlimited number of bullets and **whilst shooting** (i.e. **attacking the enemy walls**), he may or may not succeed in killing his opponent. A shot is a battle in our case, and killing one's opponent is analogous to tearing down the opponent's wall. The duelists also choose to shoot while walking or stopped. His chances of survival are greater if static. Shooting whilst walking is like **building while fighting**. This action is preferred by the Syracusans because the Syracusan objective is to intercept any of the Athenian walls. The Athenian objective is to circumvallate, but **also** to win the battles.

The **Wall/Counter-wall Duels** are played out as **three separate duels**. Where both sides can choose to fight or build or do both, as Hermocrates' focalization suggests and the narrative confirms. When the number of troops allocated for fighting is superior to the other player, the superior number wins (dominated strategy). When the allocated fighting numbers are equal, chance decides. In game theory this is called an **extensive form game with an infinite horizon**. Because the game continues until the one

player has his wall intercepted, it is referred to as an infinite horizon. If the game had a predetermined end point in time, it would be a finite horizon.<sup>548</sup>

## Descriptive Theory

**Players:** Phase 1,2,3 - {Player 1, Player 2}

Phases 1, 2 – {Nicias + Lamachus, Hermocrates + generals}

Phase 3 – {Nicias, Gylippus}

### Actions:

{fight, build, fight while building} set of actions for each player = {F, B, fb}

**Preferences for Player 1:** Player 1 chooses the action profile build when Player 2 builds followed by Player 1 fight for any other action profile Player 2 followed by Player 1 fight while building for any other action profile of Player 2.

**Preferences for Player 2:** Player 2 chooses the action profile build when Player 1 builds followed by Player 2 fight while building for any other action profile followed by Player 2 fight for any other action profile of Player 1.

To model this interaction as three phases (or as three duels), I draw a line which states that the walls intersect at **X**,<sup>549</sup> this is because the Athenians always build along the shortest route (βραχύτατον, 6.99.1, 101.1 cf. 7.2.4) and the Syracusans build at a right angle (έγκάρσιον, 6.99.3, 7.4.1, 7.7.2) or through the middle (διὰ μέσου, 6.101.2) from the city. Since both sides do not swerve at any time to change the direction of their walls, there is a

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<sup>548</sup> Osborne (2004) 227.3. Thucydides description is very similar to that of a sequential duel where both players have an unlimited number of shots. Duels usually assume that the “probability of a hit increases with time”, Luce, Raiffa (1957) 9, 453-4. This is not the case in the *Wall/Counter-wall Duels* wherein the probability of tearing down an opponent’s fortification (i.e. a hit) is determined by the amount of troops deployed for fighting (i.e. walking whilst shooting (*half step*) loses to shooting statically (*no step*)).

<sup>549</sup> This approach with lines and points or proportions to represent distance or the weight of ideas to physical objects was used in antiquity: Arist. *NE*.v.1131.b, Justice is a proportion and an equality of ratios, involving the difference in status between two individuals being equal to their shares of some quantity (tangible or intangible).

definite point of intersection. Hermocrates' implies pace, but he does not give a precise building rate. To facilitate visualisation, I propose a general metric (step) that allocates *more* building distance to build *than to fight* while building, and *some* building distance to fight while building *and none to fight*:

If a player fights while building, he completes *half* a step of the wall.

If a player builds uninterrupted, he completes a *full* step.

If a player fights he does not build.

A player may also not fight and not build, such as rest, sleep or build elsewhere.

Player 1's ordering of action profiles:  $(B,B) \succ (F,\cdot) \succ (fb,\cdot)$

Player 2's ordering of action profiles:  $(B,B) \succ (\cdot,fb) \succ (\cdot,F)$

### Phase 1: (Circle fort: Centre)

First Time Step:  $(B,B) = 1$  step each

The Athenians take Epipolae and build and complete the circle fort (6.98.2).

The Athenians have a day's advantage and begin to build on the North side of the circle fort (6. 99.1). The Syracusans reply building toward the South side of the circle fort ("from below" κάτωθεν, 6.99.3).<sup>550</sup>



Figure O

Second Time Step:  $(F,\cdot) = A$  no step,  $S$  no step

The Syracusans stop building when it seemed sufficiently built up (ἀρκούντως). In full force (ἡ πᾶσα στρατιά), the Athenians attack the Syracusans who were left to guard the counter-wall. They first destroyed the

<sup>550</sup> Building also includes gathering wood and stones (6.98.4; 99.1; 99.3).

pipes carrying drinking water into the city and then waited for the time of day (mid-day) when the Syracusans were relaxing in their tents and many had retreated into the city. The Athenians sent part of the army against the walls of the city and the other part to the counter-wall. They defeat the Syracusans, tear down their construction and carry off the stakes for their own use. The Athenians set up a trophy. (6.100.1-3)

#### **Phase 2: (The Cliff and the Marshes: South)**

First Time Step:  $(B, B) = 1$  step each

The Athenians commence construction to the South of the circle fort on the cliff through the marshes. The Syracusans come out and direct their counter-wall (a stockade and ditch) toward the middle of the marshes to intercept the construction. (6.101.1-2)



Figure P

Second Time Step:  $(F, F) = A$  no step,  $S$  no step

Once the cliff is completed, the Athenians attack in full force at dawn and take the stockade and ditch running through the marshes, a portion at first and later the rest. The Syracusans are defeated. The Athenians set up another trophy. However, the Syracusans are able to tear down 100 feet of the circumvallation wall near the circle fort. (6.101.3-102.4) From here on follows an intermission to the wall/counter-wall game regarding the double wall, and the beginning and the cessation of negotiations with the arrival of Gylippus (6.103 -104, 7.1-2)

### Phase 3: (Through Epipolae: North)

First Time Step:  $(\cdot, fb)$  = A 1 step, S *half* step

The one day head start at the beginning of the siege allowed the Athenians to build on the plateau to the North and lay stones all the way to Trogilus. (6.99.1) We are reminded by Thucydides of the stones but that the way remained only partly completed. (7.2.4) Now, Gylippus seizes the plateau of Epipolae, like the Athenians had done before. He deploys part of the army to the circumvallation walls to the South to prevent reinforcements from exiting and takes the Athenian fort at Labdalum in the North. (7.3) After this, the Syracusans begin to build their counter-wall. The Athenians continue to build and finish the double wall to the South and raise the height of a weak spot there (7.4.2-3).

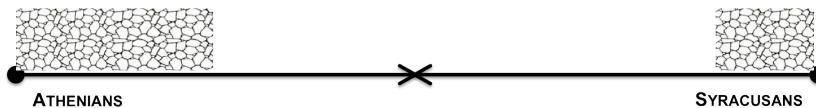


Figure Q

Second Time Step:  $(\cdot, fb)$  = A no step, S *half* step

Nicias decides to direct building elsewhere and conveys troops to Plemmyrium at the mouth of the Great Harbour (7.4.4-6). Meanwhile, Gylippus continues to build the Northern counter-wall, whilst at the same time marshaling part of the army before the Athenian walls on Epipolae (ἄμα μέν ἔτείχιζε... ἄμα δέ παρέτασσεν..., 7.5.1). The Athenians left guarding the walls (7.4.3) do the same (ἀντιπαρετάσσοντο, 7.5.2). When the time was right (έπειδή ... καιρὸς εἶναι, 7.5.2), Gylippus with part of the army engages the part of the Athenian army left at the walls. The battle is fought between the walls (μεταξὺ τῶν τειχισμάτων) where the Syracusan cavalry was of no

use (7.5.2-3). The Athenians are victorious and set up a trophy. However this time, the Athenians are unable to tear down their wall.



Figure R

Third Time Step: (, *fb*) = A no step, S *half step*

Nicias and the Athenians believe they can no longer overlook the construction of the counter-wall, since it had all but passed the end of the Athenian wall (*ὅσον οὐ παρεληλύθει*, 7.6.1). On the next day, when the time was right (*ἐπειδή καιρὸς ἦν*),<sup>551</sup> Gylippus led the army out (supposedly only part, and the other part remained at work). Nicias came out to oppose them, with the troops left behind on Epipolae. The battle was again fought between the walls (*ἐν τῷ τειχῷ ἀμφοτέρων*, 7.6.2), but not so near them, to allow the Syracusean cavalry to be effective. The Syracuseans are victorious and routed (*ἔτρεψαν*) the Athenians who fell back behind their walls. “This simple but devastating word” for rout is used to mark the turning point in the sea-battle in the great harbour (*ἔτρεψαν*, 7.71.5).<sup>552</sup>



Figure S

<sup>551</sup> Nicias' letter: 7.11.2, see Plu.Nic.19.7. *CT* 3.551; *HCT* iv.384.  
<sup>552</sup> *CT* 3.551.

#### Fourth Time Step: $(\cdot, B)$ = A no step, S 1 step

During the following night, the Syracusans continued their construction and succeeded in overtaking the Athenian construction. (7.6.4)

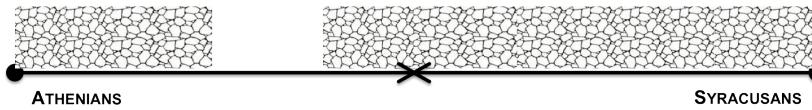


Figure T

#### **First mover advantage**

Before the siege, Thucydides writes that the Syracusans believed that if the Athenians did not control Epipolae, “even if they were victorious in battle, they would not be able to wall them off” (νομίσαντες... οὐκ ἀν ῥᾳδίως σφᾶς, οὐδ' εἰ κρατοῖντο μάχη, ἀποτειχισθῆναι, 6.96.1). Control of Epipolae before the circumvallation walls were built was effectively equivalent to building a counter-wall that intercepted an Athenian circumvallation wall. Nicias believes this to be the case (7.6.1) as does Thucydides himself (7.6.4), who verbally matches the Syracusans’ beliefs before the siege. Thucydides closes the wall/counter-wall episode with:

καὶ τῇ ἐπιούσῃ νυκτὶ ἔφθασαν παροικοδομήσαντες  
καὶ παρελθόντες τὴν τῶν Ἀθηναίων οἰκοδομίαν,  
ῶστε μηκέτι μήτε αὐτοὶ κωλύεσθαι ὑπ' αὐτῶν,  
ἐκείνους τε καὶ παντάπασιν ἀπεστερηκέναι, εἰ καὶ  
κρατοῖεν, μὴ ἀν ἔτι σφᾶς ἀποτειχίσαι. (7.6.4)

On the following night, the Syracusans succeeded in overtaking the construction of the Athenians, with the result that the Athenians could no longer obstruct their work but even if they were victorious [in battle], they were themselves prevented from walling them off.

Despite the Athenians’ five impressive victories in battle, for which they set up commemorative trophies (6.97.5, 98.4, 100.3, 103.1; 7.5.3), the Athenians still are unable to successfully invest Syracuse. Success in

fighting battles is depreciated by the failure to win the game. Without the wall, the victories convey no longterm advantage. The theme of setting up trophies throughout the Sicilian books is well known.<sup>553</sup> As is the fact that an epigram attributed to Euripides, recorded in Plutarch's *Nicias* (17.4), alludes to eight Athenian trophies (eight victories), whereas Thucydides records ten *tropaia*.<sup>554</sup> The narrative of players thinking strategically reveals that the victories in these battles had no effect upon the outcome. This could suggest that there may have been reports of these trophies back in Athens, which served as propaganda of the successes in Sicily. Thucydides debunks the value of such victories.

### **The Mistakes**

There is an impressive sequence of emphatic γάρ clauses (6.102.2-3) that appear to be indicative of Nicias' considerations during the battle, which led to a change in the wall-building strategy from circumvallation to a defensive fortification. It has been conjectured that the latter strategy would allow the fleet to beach its ships in the great harbour.<sup>555</sup> It may be possible to sense a disagreement between Lamachus and Nicias or, at the least, an agreed change in strategy before Lamachus' death (6.97, 99.4-100.1, 101.3, 102.3-4).

Nicias' change from offensive to defensive

Before any building begins, the fleet anchors in safety off the peninsula called Thapsus which "is not far from the city of Syracuse either by land or sea" near Epipolae. (6.97) Whilst, during the building of the first circumvallation wall on Epipolae, Thucydides strangely notes with a forward-looking pluperfect that the fleet "had not yet sailed into the great harbour" (6.99.4). During the construction of the second circumvallation wall to the south, the ships are "ordered to sail into the great harbour" and, arriving

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<sup>553</sup> Connor (1984) 186n3, who notes Thucydides usually omits such details but here records them.

<sup>554</sup> 6.70.3, 94.2, 97.5, 98.4, 100.3, 103.1; 7.5.3, 23.4, 34.8 and 54.

<sup>555</sup> HCT iv.484, triremes would be drawn up a few at a time in rotation.

during (ἀμα) the battle, “sail into the great harbour” (6.102.3). Here Thucydides recalls his previous note with a first person pluperfect “as I had said” (102.3), and is clearly emphatic. The Syracusans “seeing” the arrival of the fleet, retreat into the city in full force “believing” that they could no longer prevent the circumvallation wall to the south (6.102.4). Syracusan discouragement is so profound that they begin negotiations with Nicias to surrender the city.<sup>556</sup> The fleet proved to be an important deterrent, at least psychologically, in the construction of the circumvallation wall to the south, but practically, as first noted, the fleet at Thapsus was “not far from Syracuse”.

Nicias from land defensive to naval offensive:

The disaster, which befell the Athenian army in 413, was largely due to the Northern counter-wall of the Syracusans that successfully intercepted the unfinished circumvallation wall to the North. **I believe the fleet's anchorage at Thapsus was strategic for the circumvallation strategy, but not for that of a defensive fortification.** Thucydides tells us that the fleet at Thapsus provided supplies from the North (τὰ ἐπιτήδεια, 6.100.1), especially the fort at Labdalum, on the western edge of Epipolae, which served as “a storeroom for **equipment** and **utensils** for fighting and building” (ἢ μαχούμενοι ἡ τειχιοῦντες, τοῖς τε σκεύεσι καὶ τοῖς χρήμασι, 6.97.5). By sailing into the harbour, control of the sea passes to the Athenians, which allows supplies to flow to the army in the South. (τὰ ἐπιτήδεια, 6.103.3). However, the fleet's permanent anchorage in the harbour will show itself to be the greatest folly of all, as it later became trapped there. Nicias' decision to fortify Plemmyrium at the mouth of the harbour was made in order to store **equipment** and **ships** in the harbour (τὰ τε σκεύη τὰ πλεῖστα ἔκειτο καὶ τὰ πλοῖα … ὥρμει καὶ αἱ ταχεῖαι νῆες, 7.4.5). Thucydides in an authorial comment writes that this decision was the “first major cause of the ships’

<sup>556</sup> Cf. 103.3, see Smith (1913) ad loc. who rightly notes that the phrase “everything advanced as they expected” 103.3 refers to the land army and the navy's favorable expectations, not Nicias' plan, since they are juxtaposed with the Syracusans as a whole, who conversely are distressed with their plight

crews deterioration" (πρῶτον κάκωσις, 7.4.6). Nicias' decision to pursue a defensive strategy before Gylippus' arrival with a double wall, as Allison calls it (6.103.1), is later followed by this strategy, which Thucydides describes as Nicias "turning his attention to the war by sea" (7.4.4).

Nicias shift in strategy from a land defence to a naval offense is most evident in the physical movement of the equipment from Labdalum to Plemyrium (Even if Thucydides believed that the fleet at Thapsus, and especially Labdalum, could have proven decisive in completing the Northern circumvallation wall, the narrative's implicit counterfactual is tenuous. Yet, it is still plausible, since Gylippus attacks Labdalum in order to secure their way for a Northern counter-wall (7.3.4). This indicates that Gylippus considered Labdalum an obvious threat to construction. The narrative is clear however in its presentation of the strategy of both sides and their mistakes: the Athenian mistake not to complete circumvallation, because of a shifting strategy from offense to defence, and then from land to navy. The Syracusan mistake was to panic and not take advantage of the Athenian mistake and begin construction of a counter-wall in the North.

The Syracusan move to build a counter-wall in the North after Gongylus' and Gylippus' arrival is a victory, according to Thucydides, which saved Syracuse from destruction. (7.2.4) Gylippus' arrival and his decisions of when to fight have "timing" or *kairos*. Thucydides portrays his actions as calculated for the "right time". (6.93.3; 7.2.4, 5.2, 6.1) Yet, timing does not ensure victory, as he does apologise to his troops for being defeated in battle (7.5.3-4). Still, he is a generally adaptive character and understands, like Hermocrates, that the Syracusan objective is intersection and not victory in battle. (7.3.4, cf. 6.100.1) The Athenian failed siege of Syracuse marks "the end of the contest by land", and is an analogue to the sea-battle in the Great Harbour, which later "will mark the end of the contest by sea".<sup>557</sup>

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<sup>557</sup> CT 3.552.

This reading of Thucydides' account of the building and fighting makes much of the issue of deployment of troops to fight/build. There are at least two main problems with this argument. 1. The actual amount of building is never quantified; so the terminology of full and half step has no obvious toehold in the text. 2. The text is interested in action and inaction, it is interested in direction and location, but it does not obviously link how far progress is determined by the distribution of effort. Considerations of amount built and exact distribution of effort would have required Thucydides to have very detailed information about the progress of the war in Sicily, which was likely not recorded at all and was reported to him in comparative terms, such as a little or a lot. Where troop numbers for the attack deployment are quite specific, again information on the actual amount left behind to build was not considered vital.

According to this strategic argument, these elements may be said to be "missing" because Thucydides was in fact not in Sicily at the time, as many scholars believe, and worked with reports and only then organised the information returned to him. This would also explain the large concentration of information on trophies. I argue that Thucydides, by using the available information to him, organizes the mass of factual information he received into a strategic explanation about why the Athenians failed to capture Syracuse, despite the positive reports of trophy after trophy flooding into Athens. The prognostic aims for the reader appear to be for the offense that short-term victories can be deceiving successes when a long-term goal is at risk. Conversely, for the offense, a less successful short-term strategy can increase the chances of achieving success in the longrun. Thucydides in this episode was interested in evaluating cases with evidence by weaving short-term strategies into a long-term strategy. The interpretation of available evidence applies not only to Thucydides' own craft, but also to the most obvious arena of the expert 'evaluator' – the judge in the courts and the assembly at Athens.

## Majority Voting in Classical Athens

The Atticizing rhetorician Lucian, who wrote in the 2<sup>nd</sup> century AD, best describes the concept of the ideal judge. In *On the way to write history*, Lucian as a historian himself needed to be an impartial judge (ἴσος δικαστής, *HC* 41), but also the audience of historical writing must be hypercritical (τοὺς δικαστικῶς, *HC* 10). The idealized audience, sees from all angles (όρῶντας... πανταχόθεν) and weighs words like a money exchanger weighs coins (ἀργυραμοιβικῶς<sup>558</sup> δὲ τῶν λεγομένων ἔκαστα ἔξετάζοντας), removing the light and false and keeping the heavy and true. (*HC* 10)

Athenian democracy relied heavily on public participation. Collective decision-making was its core tenet. Democratic decision-making could be best observed in Athens' judicial and legislative institutions. Political decisions made in the assembly were by open *cheirotonia*, or a show of hands. In contrast, decisions made in court were by ballot, or *psephos*, and thus anonymous.<sup>559</sup> The Athenian form of democracy never required a *quorum* for majority voting, in so much as a simple majority vote wins. On the other hand, it may have required a *quorum* of attendance for votes of citizenship, or ostracism, or any vote that affected the fate of a single individual. These procedures came to dominate the political and judicial institutions at Athens from Solon's reforms in 594/3 BC and throughout the classical period.

The majority procedure may not be peculiar to democracy or to classical Greece. There is a possible antecedent in the *Shield of Achilles*, in one reading of a very puzzling passage, wherein each judge is required to adjudicate in the summit issue (H.II.18.497-508).<sup>560</sup> The adjudication to receive the most applause won. Whether a procedure called for applause,

<sup>558</sup> Cf. *Aes.Ag.*434-444.

<sup>559</sup> Literally it means 'pebble' but in the classical period (certainly in the fourth century – fifth century is less clear) they used specially made voting discs. See Todd (1993) 132-3.

<sup>560</sup> MacDowell (1978) 21-22.

pebbles or hands, democratic Athens in particular appears to have believed in the efficiency or perhaps even in the accuracy of public choice.<sup>561</sup>

Dennis Mueller, a modern political scientist and economist, writes that "The Athenian practice of having the assembly of all citizens serve as a jury in some cases and its use of the simple majority rule put Condorcet's theorem into practice more than two millennia before he proved it."<sup>562</sup> Based on Condorcet, Mueller categorically states that the Greeks believed in the normative properties of the majority vote, that is to say, that it was the most accurate form of passing judgment. The Greeks never theorised it but their practice is indicative. In 1785, the Marquis de Condorcet, who was the first to prove this result for a simple majority vote, assumed that any single judge is more likely than less likely to arrive at a correct judgment. If this holds true for all the judges, then as the number of the judges increases the accuracy of the verdict increases as well. The question we put to Thucydides is therefore whether a fifth century Athenian was more or less likely to pass correct judgment?

### **Majority Voting in Thucydides**

It seems fair to question, for one supremely concerned with motivation, judgment (*gnome*) and accuracy (*akribēia*), whether Thucydides did believe in the accuracy or efficiency of the simple majority vote? Voting and elections suffuse Thucydides' account of the war.<sup>563</sup> In a number of cases Thucydides records the discontentment of some with the basic element behind a simple majority vote. That is, the "system of many votes" *polypsephia*, most notably implemented by the participants of the two great confederacies: the Delian League and the Peloponnesian Confederacy. The

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<sup>561</sup> Thuc.1.87 for Spartan practice in classical Greece in non-democratic societies. What differentiates democracy is the number involved and the absence of discrimination by status rather than the principles of arriving at a decision in a deliberative body.

<sup>562</sup> Mueller (2003) 129.

<sup>563</sup> E.g. votes: 1.79, 1.87.3-6, 1.88.1, 1.125.1-2, 1.145.1, 3.49.1, 3.70.2, 3.115.3, 4.2.2, 4.88.1, 5.17.2, 6.8.2-3, 6.13.1, 6.24.3-4, 6.26.1, 6.50.1, 6.51.1-5, 6.93.4, 7.16.1-2, 7.17.1-2, 7.47.3-4, 7.48.1, 8.15.1, 8.97.3, 8.97.1-2.

Mytilenians who in 428 BC decide to revolt from the league tell the Spartans that (3.10.5, 3.11.4):

ἀδύνατοι δὲ ὅντες καθ' ἐν γενόμενοι διὰ πολυψηφίαν ἀμύνασθαι οἱ ξύμμαχοι ἐδουλώθησαν πλὴν ἡμῶν καὶ Χίων. ... ἐν τῷ αὐτῷ δὲ καὶ τὰ κράτιστα ἐπί τε τοὺς ὑποδεεστέρους πρώτους ξυνεπήγον καὶ τὰ τελευταῖα λιπόντες τοῦ ἄλλου περιηρημένου ἀσθενέστερα ἔμελλον ἔξειν.

The allies, unable to unite and defend themselves because of the large number of voting states, were indeed all made subjects, apart from ourselves and the Chians. ... [the Athenians] led a combination of the strongest states against the weakest first, and left the strongest till last when they could expect to find them weakened with the other support stripped away.

On the Peloponnesian confederacy, Archidamos argues that the vote of the Peloponnesian confederacy to go to war is a result of the private interests of individual states (1.82.6).

ἐγκλήματα μὲν γὰρ καὶ πόλεων καὶ ιδιωτῶν οἵον τε καταλύσαι: πόλεμον δὲ ξύμπαντας ἀραμένους ἔνεκα τῶν ιδίων, ὃν οὐχ ὑπάρχει εἰδέναι καθ' ὅτι χωρήσει, οὐ ράδιον εὔπρεπῶς θέσθαι.

Complaints brought by cities or by individuals, can be dealt with; but a war, which is undertaken by a whole coalition protecting their private interests whose outcome is unknowable – that will not be easy to bring to a seemly conclusion.

The complaint is that voters follow their private interests and because of it they are unable to communicate with one another in order to devise mechanisms to manage their common interest. For as the Corinthians argue “Common interest is the surest guarantee for states and individuals alike” (ὡστε πανταχόθεν καλῶς ὑπάρχον ὑμῖν πολεμεῖν καὶ ἡμῶν κοινῇ τάδε παραινούντων, εἴπερ βεβαιότατον τὸ ταύτα ξυμφέροντα καὶ πόλεσι καὶ ιδιώταις εῖναι, 1.124.1)

Whereas the Athenians were able to capitalize on the inefficiency of allied collective decision making by concentrating power at Athens, Pericles astutely notes that the Peloponnesian confederacy has a large number of different states with an equal vote (*isopsephoi*, 1.141.6-7).

μάχη μὲν γὰρ μιᾶς πρὸς ἄπαντας Ἑλληνας δυνατοὶ Πελοποννήσιοι καὶ οἱ ξύμμαχοι ἀντισχεῖν, πολεμεῖν δὲ μὴ πρὸς ὅμοιαν ἀντιπαρασκευὴν ἀδύνατοι, ὅταν μήτε βουλευτηρίω ἐνὶ χρώμενοι παραχρῆμά τι ὀξέως ἐπιτελῶσι πάντες τε ἴσωψηφοι ὄντες καὶ οὐχ ὁμόφυλοι τὸ ἐφ' ἑαυτὸν ἔκαστος σπεύδῃ: ἐξ ὧν φιλεῖ μηδὲν ἐπιτελεῖς γίγνεσθαι. καὶ γὰρ οἱ μὲν ὡς μάλιστα τιμωρήσασθαι τινα βούλονται, οἱ δὲ ὡς ἡκιστα τὰ οἰκεῖα φθεῖραι. χρόνιοι τε ξυνιόντες ἐν βραχεῖ μὲν μορίῳ σκοποῦσί τι τῶν κοινῶν, τῷ δὲ πλέονι τὰ οἰκεῖα πράσσουσι, καὶ ἔκαστος οὐ παρὰ τὴν ἑαυτοῦ ἀμέλειαν οἴεται βλάψειν, μέλειν δὲ τινι καὶ ἄλλῳ ὑπὲρ ἑαυτοῦ τι προιδεῖν, ὥστε τῷ αὐτῷ ὑπὸ ἀπάντων ίδιᾳ δοξάσματι λανθάνειν τὸ κοινὸν ἀθρόον φθειρόμενον.

Each thinks that their inertia [private-interest] will do no harm, and that it is someone else's responsibility rather than theirs to make some provision for the future: the result is that with all individually sharing this same notion they fail as a body to see their **common interest** going to ruin.

Pericles adds that this is the result of a fundamental ignorance with regard to the cause of the collective's weakening through the inability to communicate.<sup>564</sup> The lack of communication is a result of the physical distance from one another. (1.3.4; 141)<sup>565</sup> The success of a majority vote depended on good collective decision-making which requires that each participant individually pass judgment with the common interest in mind.

<sup>564</sup> This is of course Pericles', and not Thucydides' thoughts, but its prominent location, or its critical position in the leading up toward the beginning of the war, belies a structural similarity to the ideas on coalition and war with respect to collective decision-making that Thucydides is interested in generally: Mytilene, the Sicilian debate, also in Sicily (Hermocrates bk4) suggests that the reader should take the problem seriously and apply it more generally.

<sup>565</sup> E.g problems with a coalition of citizens, the cause is that it is "impossible for everyone to know everyone else", 8.66.3, or that the citizens are physically distant from the object of judgment, 8.1; Cf. 3.10.

We can compare how Thucydides describes an interstate coalition and Athenian democracy. Thucydides' narrative shows similar dynamics at work both in the coalition and in the operation of the democratic assembly. The problem shared by both collectives was that there was no way to check that a decision-maker's vote was guided by the common interest (τὸ κοινὸν). So it thus appears that Condorcet was correct in assuming that a simple majority rule could be accurate, as long as all the voters pass judgment whilst upholding the common interest. Thucydides does not seem to me to describe a mechanism that ensures this.

Apart from ensuring votes were taken in the common interest, another problem raised by Thucydides was the number of choices presented to the assembly or jury. Choices in court were for the most part binary, acquit or convict, accept or reject. Thucydides by and large in his assembly narratives likes to reduce debates to binary contests (largely because the issues which matter for his *History* are often in this context binary – peace or war, harshness versus leniency, expansion versus status quo). The assembly as a rule would hear many proposals and choose among these, but Thucydides for example provides the reader with only the two most extreme proposals in the so-called Mytilenian debate. Cleon and Diodotus made proposals, which won the greatest support from the assembly and also were the most opposed to each other. The vote was almost a *cheirotonia anchomalos*, which sided with Diodotus' more lenient proposal by only a small margin. Thucydides is interested in agonistic one-on-one debates, as such he makes an assembly vote more like a judicial vote, than the assembly actually was. Still, the assembly at times did hold votes of a binary nature. It is largely accepted that the two day vote at Athens on whether to accept or reject Corcyra into the Athenian alliance, met on the first day to decide whether or not to agree to an alliance and on the second day met to decide whether the alliance would be offensive or defensive. Thucydides is generally interested in binary choices, but he also shows an awareness of votes where there are more than two candidates or choices.

### The Council of War in Thucydides (6.47-50.1)

Hans-Peter Stahl ascribes to Thucydides an implicit counter-factual statement about the events in Sicily. Stahl writes that "in 6.47-50 Thucydides makes it quite clear that an attack on Syracuse immediately upon the Athenians' arrival in Sicily would give a very real chance for victory, because the Syracusans were then shocked by surprise and inadequately prepared."<sup>566</sup> Had the Athenians' followed Lamachus' plan, they would have had "a chance for victory". This "what-if" conjecture is based on a series of assumptions which have been made over the last half-century regarding the narrator Thucydides' preferences over the speeches in the council of war.

This section seeks to examine the relationship among the three proposals recorded in the council of war in the summer of 415 b.c.e. The three generals Nicias, Alcibiades and Lamachus each present a plan of action, which Thucydides records in *oratio obliqua*. Each general preferred his own strategy to any other, but how did they rank each other's proposals? This question will help us to answer, in a systematic way, why Alcibiades' plan won. This ultimately may in turn shed some light on another facet of the narrator Thucydides' preferences.

Up to today, scholarship has largely focused on which plan Thucydides himself preferred.<sup>567</sup> Dover, along with most, believed Thucydides sided with Lamachus.<sup>568</sup> Cawkwell believed it was with Alcibiades.<sup>569</sup> Ellis and Lazenby believed it was with Nicias.<sup>570</sup> Hornblower, who believes there are 'hints' and nothing more, extends the issue to pose a second question: "Which did Thucydides mean us to think was right? And, quite apart from Thucydides, which of the three plans was better than the others?" He notes that both questions should be distinct, however, given that the only source is

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<sup>566</sup> Stahl (1973) 72.

<sup>567</sup> CT 3. 423.

<sup>568</sup> Dover (1970) 315-16.

<sup>569</sup> Cawkwell (1997) 83.

<sup>570</sup> Ellis (1979) 50; Lazenby, (2004) 139 cf.168.

Thucydides, these are indistinguishable. Dover alone ventured to abstract what possible thoughts may have motivated Lamachus to vote for Alcibiades' plan in the end, even though his appeared to be the 'right one'. Dover argues that Lamachus changes his vote either "because Alkibiades persuaded him" or because "if Alkibiades' plan were rejected... morale might suffer". In the episodes containing verbal matching, Demosthenes' counterfactual statement at 7.42.3 seems to reflect an experience learned, which Lamachus' had foreseen and thus predicted Syracusan reactions. Hunter argues that Lamachus' strategy was devised observing Archidamos' experience in the first invasion of Attica in 431 b.c.e.<sup>571</sup> However, no one has sought to analyze Lamachus' choice as a function of a simple majority voting procedure, in the case of divided command.<sup>572</sup>

Assembly speeches in Thucydides are usually presented as duels, and only rarely with a third speech. (e.g. duels in direct speech, but also note: Hermocrates 6.33-4, Athenagoras 6.36-40, Anonymous General 4.41)<sup>573</sup> Thucydides' presentation of proposals as binary oppositions, more at home in a dikastic setting, is usually placed before an assembly of the people. The assembly decision-making process was simple and involved a majority vote. The simplest and most reduced form of a majority vote is one in which there are three votes for two choices. In the case of the council of war, we have three votes for three candidates. Since the first round is a tie, in the second round each one is given the option to change the initial vote, for himself, to that of another candidate. Lamachus switches his vote because his strategy was not feasible at the time of its conception. I argue that this triggered him to seek an alternative plan to his, but that of the two was closest in character to his own.

Scardino summarizes the policy valence of each speech. Nicias' speech is a plan to provide "Beschraenktes Engagement gegen Selinunt" (trans. limited commitment to Selinuntes), while Alcibiades is a "diplomatische Strategie"

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<sup>571</sup> Hunter (1973) 95-100.

<sup>572</sup> Rood 170.

<sup>573</sup> For general intro to speeches in oratio recta and obliqua in Thucydides, CT 3.32-5.

(diplomatic strategy) and Lamachus' is a "frontaler Angriff auf Syrakus" (frontal attack on Syracuse).<sup>574</sup> Alcibiades' plan was a moderate plan in comparison to the more passive Nicias and aggressive Lamachus. The plan which Lamachus proposes requires a full assault on Syracuse and would require cavalry to protect the invading army from the defending city. The absence of cavalry is a well-noted theme in the Sicilian Expedition.<sup>575</sup> (Chief passages: 6.21.1, 22.1, 30-2, 63.3, 64.1, 67.1, 68.3, 70.3, 71.2, 74.2, 88.6, 94.5, 7.4.6, 11.2, 78.3, 81.2, 85.1.) Cavalry was needed for siege operations, especially those requiring wall building, in order to protect builders and sappers from enemy attacks.<sup>576</sup> The Athenians in 415 b.c.e. had no such contingent and could not effectively pursue a land siege without one, which only arrives in 413 (6.94, cf.88.6). Lamachus' choice for an aggressive strategy, once excluded, was left with the next best alternative: Alcibiades' moderate strategy.

### The Council of War

The most general characterization of a simple majority vote needs only three voters, such that a 2 to 1 majority determines a win. Thucydides records a verdict with only three voters, who were simultaneously also candidates. This episode is the *Council of War* between the three generals Nicias, Alcibiades and Lamachus: three speeches delivered in indirect discourse (6.47-49).

They each put forward a proposal (*gnome*) for three distinct invasion strategies for Sicily.<sup>577</sup> Nicias goes first, then Alcibiades, followed by Lamachus. Nicias and Alcibiades are given 12 lines each in the Greek while Lamachus' speech is reported with a whopping 19 lines, which Hornblower argues "is perhaps a hint" that Thucydides considered Lamachus' advice to

<sup>574</sup> Scardino (2007) 392.

<sup>575</sup> Stahl (1973) 60-77; Kern (1999) 121-134; Steiner (2005).

<sup>576</sup> Eur. *Ph.* 732-3; van Wees, (2004) 126; Kern (1999) 124.

<sup>577</sup> Hunter (1973) 100-1, on Lamachus having learnt from the experiences of Archidamos in 431; Rood 168-170, for the indirect speeches of the council of war as "strategic guidance"; CT 423-425 for the three speeches of the council of war as Thucydides' speeches, quoting Scardino (2007) 557ff.

be correct or that Lamachus' plan was the better one. One part of this question ponders what is right or wrong, whereas the other requires us to compare "something" in the speeches. Comparing them first and then asking whether one, if any, was right is one way to tackle how to measure the efficacy of each general's plan of action. Each makes a policy proposal which gives us some information to compare the risk of each invasion strategy. These speeches are specifically about expenditure, since they follow the discovery that the Egestans did not have any money (χρήματα) to fund the expedition (6.46).

Nicias' Proposal (6.47): Nicias proposes minimal engagement, which is to sail directly to Selinous, settle matters there, then sail back promptly to Athens flaunting the power of Athens. It would also be inexpensive. The Egestans would be required to pay for the 60 ships they requested (ταῖς ἔξηκοντα ναυσί, ὅσασπερ ἡτήσαντο, ἀξιοῦν διδόναι [χρήματα] αὐτοὺς τροφήν). The expedition would thus not put the state at risk by consuming state property (καὶ τῇ πόλει δαπανῶντας τὰ οἰκεῖα μὴ κινδυνεύειν). This strategy would incur very little expense.

Alcibiades' Proposal (6.48): Alcibiades proposes a diplomatic engagement with the islanders (ἔς τε τὰς πόλεις ἐπικηρυκεύεσθαι) and only later to attack Selinous and Syracuse, and ultimately Sicily. Regarding expenditure, he argues that the local allies they make would supply resources (τοὺς δὲ φίλους ποιεῖσθαι, ἵνα σῖτον καὶ στρατιὰν ἔχωσι). This strategy would incur some expense, if they were not able to secure these local alliances as a result of the time spent procuring allies.

Lamachus' Proposal (6.49): Lamachus proposes a military engagement to sail directly to Syracuse in an immediate attack (τὴν μάχην ποιεῖσθαι) and then sail back to Athens. Lamachus believes that with a quick assault on the city, while the Syracusans were moving their goods into the city the Athenians would not lack for resources, if they were able to take control of a position before the city. (εἰκὸς δὲ εἶναι καὶ ἐν τοῖς ἀγροῖς πολλοὺς

ἀποληφθῆναι ἔξω διὰ τὸ ἀπιστεῖν σφᾶς μὴ ἥξειν, καὶ ἐσκομιζομένων αὐτῶν τὴν στρατιὰν οὐκ ἀπορήσειν χρημάτων, ἡν πρὸς τῇ πόλει κρατοῦσα καθέζηται.) However, with the loss of Egestan money, the Athenians would need to send over more cavalry and money for a first assault, since at this point they had limited help from local allies. This strategy would incur great expense, if they were not able to secure a position near the city and putting the whole land army in danger of destruction.

Apart from Nicias, whose main concern is cost reduction, the proposals say nothing about the gains to be acquired by the Athenian state if they are victorious.<sup>578</sup> Therefore, solely in terms of risk assessment (i.e. an action which may incur a negative monetary payoff), Nicias' proposal is risk averse, Lamachus' is risk loving and Alcibiades' sits comfortably between them, in a comparatively risk neutral zone. Despite Lamachus' proposal being the riskiest of the three, why do scholars still believe Lamachus' strategy to be Thucydides' preferred strategy?

This is because Lamachus' insights come true in the narrative. As Lamachus rightly predicts, a time-consuming (χρονίσῃ) diplomatic strategy such as Alcibiades', would devolve into a 'revival of courage' and 'contempt' for the invader (6.49.2, 6.63.2),<sup>579</sup> uniting the Syracusan alliance as opposed to dividing it. Lamachus had advocated they attack immediately (ἄντικρυς). And as it so happened, after Alcibiades' recall, Nicias 'did not attack at once' (οὐκ εύθὺς ἐπέκειντο, 6.63.2), and subsequently became the action, which Demosthenes believed, was the cause of Nicias' failure to capture Syracuse (οὐκ εύθὺς προσέκειτο, 7.42.3). The counterfactual reasoning expressed by Demosthenes' focalization (7.42.3)<sup>580</sup> is that if the

<sup>578</sup> CT 3.423; Hornblower (*Greek World*) 143, contra Hammel (1998) 117 n.7.

<sup>579</sup> Rood 169ft.46, note the repetition of the terms 'revival of courage' (ἀναθαρσεῖν) and 'contempt' (καταφρονεῖν) at 6.49.2 and 6.63.2.

<sup>580</sup> ὁ δὲ Δημοσθένης ιδὼν ὡς εἶχε τὰ πράγματα καὶ νομίσας οὐχ οἷόν τε εἶναι διατρίβειν ούδε παθεῖν ὅπερ ὁ Νικίας ἔπαθεν (ἀφικόμενος γὰρ τὸ πρώτον ὁ Νικίας φοβερός, ὡς οὐκ εύθὺς προσέκειτο ταῖς Συρακούσαις, ἀλλ' ἐν Κατάνη διεχείμαζεν, ὑπερώφθη τε καὶ ἔφθασεν αὐτὸν ἐκ τῆς Πελοποννήσου στρατιῷ ὁ Γύλιππος ἀφικόμενος, ἦν οὐδὲ ἀν μετέπεμψαν οἱ Συρακόσιοι, εἰ ἐκεῖνος εύθὺς ἐπέκειτο: ικανοὶ γὰρ αὐτοὶ οἰόμενοι εἶναι ἄμα τ' ἀν ἔμαθον ἥσσους ὅντες καὶ ἀποτετειχισμένοι ἀν ἥσαν, ὥστε μηδὲ εἰ μετέπεμψαν ἔπι θύμοις ἀν αὐτοὺς ὠφελεῖν) , ταῦτα οὖν ἀνασκοπῶν ὁ Δημοσθένης, καὶ γιγνώσκων ὅτι καὶ αὐτὸς ἐν τῷ

Athenians had adopted Lamachus' strategy, they would have been more successful.<sup>581</sup>

What is so special about Lamachus' strategy?

Lamachus' strategy, is very similar to that of Archidamos' strategy in the *First Invasion of Attica*. He proposes that the Athenian army encamp near the walls of the city and in view (*opsis*) of Syracuse to create the greatest division amongst the city's allies. (6.49) Distance is fundamental to the strategy.<sup>582</sup> The distance of the attacking army cannot exceed the limits of vision. The first sight (*τὸ πρῶτον*) the enemy will have of the Athenian army will cause the greatest distress (*μάλιστα ἐκπεπληγμένοι*, compare *ἐκπληξις* at 6.98.2) and, this act will in turn, incline the Syracusan allies more toward defection.<sup>583</sup> Lamachus expects that the Syracusan allies will not wait to observe who will win.<sup>584</sup>

Lamachus' strategy is apparently optimal as a strategy, as we saw with Archidamos,. Lamachus proposes that the Athenians do battle right up against the city as quickly as possible" (6.49). Lamachus stresses that the troops must go "up to" the city (*πρὸς τῇ πόλει*, 6.49.1) for which the intention of attack carries a destructive connotation.<sup>585</sup> The difference however (and a significant one) is that Archidamos does not want to attack, but to intimidate. They share the belief in instilling fear, and this is more akin to Nicias' strategy. The Sicilian expedition for Lamachus seeks to conquer the whole of Sicily, not only Syracuse (6.1, 8.4).<sup>586</sup> Despite the differences in risk with

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παρόντι τῇ πρώτῃ ἡμέρᾳ μάλιστα δεινότατός ἐστι τοῖς ἐναντίοις, ἐβούλετο ὅτι τάχος ἀποχρήσασθαι τῇ παρούσῃ τοῦ στρατεύματος ἐκπλήξει. (7.42.3)

<sup>581</sup> CT ad loc. for counterfactual reasoning, and also whether this is Thucydides or Demosthenes focalization, see also Rood 67, 67ft.21, 161ft.7. Also see Hornblower (op. cit.) 6.50.1 ad loc. for Thucydides guiding the reader to think counterfactually "We are meant to think counterfactually: what if Lamachos' view had prevailed?"

<sup>582</sup> At a distance in sight: 2.21.2, 6.49.2; also Rood 66, on 3.73.3 and "the importance of being seen".

<sup>583</sup> For first as the worst: Corcyrean stasis; with specific reference to this episode 6.49.2 and 7.42.3

<sup>584</sup> Note the use of 'overlook' *οὐ περιόψεσθαι* at 2.20.4 and "watch and see" *οὐ περισκοποῦνται* at 6.49.4.

<sup>585</sup> Rood 168; CT 3.622.

<sup>586</sup> Rood 162.

Archidamos' passive strategy, Lamachus' strategy seems to put right the complaints the Spartan soldiers had against Archidamos, for not capturing the goods outside the walls (ἐσκομιζομένων...).

Lamachus' strategy is so well devised it seems ludicrous that he of the three should have changed his vote. "This was what Lamachus said, but he nevertheless gave his support to Alcibiades' proposal." (Λάμαχος μὲν ταῦτα εἶπὼν ὅμως προσέθετο καὶ αὐτὸς τῇ Ἀλκιβιάδου γνώμῃ. 6.50.1) Thucydides' authorial "nevertheless" begs the reader to "think counterfactually".<sup>587</sup> If not here, Thucydides uses Demosthenes as a focalizer for this belief. Lamachus was a minor partner in political terms, though constitutionally equal, and in the case of a tripartite division of opinion, a decision depended on a general supporting one of the others.

Both Nicias and Alcibiades put forward proposals which were entirely feasible with the armament they had brought with them. The former to leave with what he came, and the latter to search for more allies and then pursue a military strategy. Meanwhile, Lamachus' proposal required a cavalry. In the summer of 415, the Athenians spend most of their time taking captives to sell for money and bringing together troops and whatever cavalry they could get a hold of from allies (6.62). In the winter of 415-14, the Athenians make preparations for an assault on Syracuse, but as the Syracusan expected, the Athenians did not. (6.63) "Since they had no cavalry of their own they realised that the large numbers of Syracusan cavalry would inflict heavy damage (βλάπτειν ἀν μεγάλα) on their light-armed forces and the mass of their followers." They were forced to take up a position far from the city "from which they would be protected against any damage from the cavalry". (6.64) Without, most importantly cavalry, and also resources, Lamachus' strategy was a mute point. The Athenians could not approach the city without incurring heavy damage.

It seems to me that there must have been a discussion among the generals

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<sup>587</sup> CT 3.425.

after the first round of proposals were made to decide which of the three, if any were impracticable. Upon evaluation, they all agreed that his proposal was not feasible and therefore in a second round of votes, sided with Alcibiades' strategy.

### **Why Alcibiades and not Nicias?**

Harold Hotelling in 1929 demonstrated that a voter when he is positioned along a policy spectrum between say conservative and liberal, he will vote for the politician who is closest to his position. Using this same idea, I attempted to show that Nicias proposed a policy which was the least risky of the three, and Lamachus one which was the riskiest. Alcibiades put forward a proposal that appears to have a risk valence somewhere between the two. Lamachus in this way prefers Alcibiades' strategy because it closest to his over Nicias' which is furthest.

Likewise if Nicias' proposal were scrapped, he would prefer and vote for Alcibiades over Lamachus. If Alcibiades proposal were scrapped, it would be difficult to say which he would choose given he is the median voter. But voters at the either end of the spectrum tend to vote for centre policies, because of proximity alone, and this result is derived from Hotelling's simple yet ingenious Median Voter Model.

Majority voting is explored in Thucydides narrative through historical events. Not only in its political incarnation where decision-makers are made to decide among more than two policies but also in its legal context. Todd argues that the counter assessments at court called *timesis* had the plaintiff propose a penalty (*timema*) and the defendant an alternative (*antitimema*). The *dikastai* voted and could only choose between the two possibilities. "It was a function of *timesis* to encourage both litigants to make their proposals moderate, for fear of stampeding the jury into the opponent's arms." Todd believes that most proposals tended to be moderate, but argues that in the case of Socrates' proposed derisory fine, Socrates left "the *dikastai* with little

alternative but to vote for the prosecution's proposal of death." We lack much ancient evidence, since we possess only one of the pair of speeches delivered. (Except for Antiphon's mostly didactic *Tetralogies*) Binary choices for a *dikastes* or judge in Athens seemed to have favored moderate proposals. Whereas when more than two proposals were serious options, the moderate proposal wins. Thucydides has the ability to comment on the intellectual voting procedure by portraying assembly votes as courtroom cases, and characterize generals in the field as politicians in the assembly making proposals and then showing the process by which voters eliminate policies.

## Chapter 3 - Incomplete Information, Bounded Rationality

Non-causal *temporal* markers tell the reader, *who did what when?* The combination of the *informational* register with the *temporal* register answers, *who knows what and did what when?*<sup>588</sup> As a result, the reader is told *why* something was done then. Knowing or not knowing leads to an action, even if it is *doing nothing*.

### First and Second Mover Models

What we seek to uncover in this section is *why* actors prefer to move before or after each other? Where is there a struggle to be the first mover (struggle for leadership), or conversely a struggle to be the second mover (struggle for followership)? Specifically, what compels actors to make a move before another? In this section we will first explore Thucydides' acuity in deciphering in which situations there is an advantage to the players to move first or to move second.

Firstly, the words we should investigate are the usual terms for before and after. These terms are joined with verbs to describe *acts* or *thoughts*. The terms for before are πρίν (+ Infinitive), πρότερον, πρό (+ Genitive case) and πρόσθεν. For an example of *thought*, when Harmodius and Aristogeiton believed to have been discovered in their plot to kill the tyrant Hippias, “before being arrested, they were willing to risk their lives in achieving something” (βουλόμενοι δὲ πρὶν ξυλληφθῆναι δράσαντές τι καὶ κινδυνεῦσαι, 1.20.2, and πρότερον, 6.57). Therefore, they kill Hippias' younger brother Hipparchus. The terms for after are μετά (+ Accusative case) and ὕστερον. For an example of *action*, after Hipparchus was killed, Hippias' tyranny changed from being more lenient (6.54.5) to becoming harsher (χαλεπωτέρα μετὰ τοῦτο ἡ τυραννίς κατέστη, 6.59.2). The tyrant Hippias

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<sup>588</sup> Rood 13, “Focalizing and temporal strategies are linked: the important question is, ‘who knows what when?’.”

was deposed and he fled to Persia, for he now feared **change (metabole)**. Thucydides locates an agent's change of character near terms such as *metabole*<sup>589</sup> or *stasis*<sup>590</sup> or with particular verb forms.

Twenty years later, Hippias set off with the Persian expedition to Marathon (ὅθεν καὶ ὄρμωμενος ἐς Μαραθῶνα ὕστερον ἔτει εἰκοστῷ ἥδη γέρων ὧν μετὰ Μήδων ἐστράτευσεν, 6.59.4). Thucydides twice connects in temporal terms the fall of tyranny with the battle of Marathon: After all Greek tyrannies were dissolved, not long after the Persians and Athenians fought in the Battle of Marathon. (μετὰ δὲ τὴν τῶν τυράννων κατάλυσιν ἐκ τῆς Ἑλλάδος οὐ πολλοῖς ἔτεσιν ὕστερον καὶ ἡ ἐν Μαραθῶνι μάχη Μήδων πρὸς Αθηναίους ἐγένετο, 1.18) In the case of Hippias' tyranny *one single event* precedes the battle, in the case of all Greek tyrannies *many events of the same kind* precede the battle. There is causal force in the narrative description when an author chooses to describe one event or many events of a similar kind as happening before another event of a very different kind. Still, the fact that one event preceded another need not imply causation. These causal connections are at times implicitly divulged to the reader, as is the case here.

### ***Change of State and Accurate Information***

It is vital to disassociate sequential decisions from a change of an agent's character. For, there is a difference between the description of a dynamic decision problem (e.g. Harmodius and Aristogeiton's actions before arrest) and the description of a change of state (e.g. the tyrant's character changes from lenient to harsh). A "change of state" is a "change in the *status quo* of the world", from say playing football on a day with sunny weather to a day with rainy weather. The game state (weather) is part of the game (football)

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<sup>589</sup> Change - Medical: 2.48.3; Fortune: 2.43.5, 53.1, 61.2; 3.82.2; Population: 6.17.2; Political: 6.20.2, 59.2, 76.4; 7.55.2; 8.75.2, 98.1.

<sup>590</sup> Conflict - within or between states: 1.12.2; 2.20.4, 48.3; 3.34.1, 62.5, 82.1; 4.74.4; 6.17.4; coup: 7.33.5; also literally "a standing", thus a state or position, later came to refer to a faction or party 7.50.1. The whole war is a *stasis* on a grander scale and is called a *kinesis*, literally a convulsion (1.2).

from beginning to end. The tyrant's character as lenient or harsh is analogous to the weather being sunny or rainy.

These changes of state are **changes in the state of affairs and of mind of players** such as from weak to strong, from holding an advantage to being at a disadvantage and from confident to fearful, from calm to angry. These changes happen because a player (1) sees or hears something: Harmodius and Aristogeiton see a conspirator speaking to Hippias and believe they are discovered (*εἶδόν*, 6.57), (2) or by chance: a chance love affair caused Hippias' to become *fearful* (*δι’ ἐρωτικὴν ξυντυχίαν*, 6.54; *τοιούτω μὲν τρόπῳ δι’ ἐρωτικὴν λύπην ἡ τε ἀρχὴ ... διὰ φόβου*, 6.59.1-2). In a few paradigmatic cases, there is a semantic uniqueness in the use of a certain verb form: *καθεστηκώς*. The four instances of this form in the *History* refer to the turning point between one state and another. The changes in state are signaled with the use of *καθεστηκώς*, -κυῖα, -κός, the perfect participle of the verb *καθίστημι*. It signals the point of transition to identify the beginning of a state. A war begins in the mind. The Spartan's *begin* to feel fear of the Athenians, which leads to their first open quarrel with the Athenians (*διαφορὰ... φανερὰ ἐγένετο*). “It had been clearly established that they [the Spartans] had been deficient” in the art of siege operations (*καθεστηκίας τούτου ἐνδεῖ ἐφαίνετο*, 1.102). In this description, the repetition of the idea of clarity (*ἐφαίνετο*, *φανερὰ*) emphasizes sight as a trigger for an emotion. The Spartans realize that there is another player growing, making their deficiency apparent. A transition point is a beginning, but also a maximum or minimum point. Pericles addresses the Athenians who have increased the state's strength and are themselves at the prime of their life (*μάλιστα ἐν τῇ καθεστηκίᾳ ἡλικίᾳ ἐπηυξήσαμεν*, 2.36).<sup>591</sup> A strong state possesses a

<sup>591</sup> The exact age of the ‘height of life’, *helikia*, is unknown, but this passage could be referring to an age as half way through life. Thucydides’ concern for age is evident, in that at 5.26.5 he tells us *αἰσθανόμενός τε τῇ ἡλικίᾳ καὶ προσέχων τὴν γνώμην*, “I was of an age (at the height of life?) to comprehend events”. Graves (1891) ad loc. notes the similarities of this passage with the opening chapter of the *History*, such that he began writing at the middle of his life. “It is noticeable that two of Thucydides’ intervals of time in this digression [Sikelika], 245 years (4.2) and 70 years (5.2), are multiples of 35.” Pericles’ funeral oration also puts stress on maturity. The minimum age for generalship is unknown, and we know Thucydides assumed the post in 424/23. Thucydides says that Alcibiades at the age of 30 (Canfora (2006); or “about 32”, Gomme, ad loc.) was “too young” (6.12.2, 6.17.1). Canfora

population at its intellectual acme which has overcome the brashness of youth and has yet to feel the diffidence of old-age.<sup>592</sup> Another example is the moment the Athenians decide to turn against Pericles (πανταχόθεν τε τῇ γνώμῃ ἄποροι καθεστηκότες ἐνέκειντο τῷ Περικλεῖ. 2.59, repetition, καταστῆσαι). This **change of mind** occurred because they had reached a minimum point of deficiency. They were afflicted by plague and surrounded from all sides by loss (ἄποροι i.e. without means or resources, helpless). Further, changes of state whether it is physical, emotional or an intellectual change are described in the same way as changes of seasons. The Spartan's in an invasion of Attica note that it was colder than the established season (παρὰ τὴν καθεστηκυῖαν ὥραν, 4.6). Their invasions are made precisely at the height of summer, when the corn was ripe, but this time the corn was green (2.19).<sup>593</sup> All instances refer to a point precisely between one state and another state - between growth and decay - exemplified by military supremacy and inferiority, youth and old-age, wealth and poverty, and finally between winter and summer. Thucydides with choice exempla refines the concept of a change of state with critical points. The exact moment in a change of state from growth to decay may occur at a known or unknown point in time; 'timing' (*kairos*) in the case of human decision-making and chance (*tyche*) in the case of nature (2.64.2).<sup>594</sup> I argue that Thucydides often describes a static or dynamic interaction as beginning with **a change of state**. Sight, either visual or in the "mind's eye" as in foresight, is a common mechanism to change the state of mind of a player.

With respect to dynamic interaction, a unique type of information structure between opponents may determine who moves first or second. In the cases we investigated so far the informational and temporal structures coincided.

argues that at 1.1.1 that "he seems to be insisting on his own historical and political perception." see Jacoby *Apollodors Chronik* (1973) 43-4, argues 40 was the point of intellectual *acme*.

<sup>592</sup> See *Aphorisms* 1.13, οἱ καθεστηκότες are "adults" which are contrasted with elders and children (γέροντες ... παιδία).

<sup>593</sup> A list of the (annual) invasions of Attica: 446 BC (1.114.2), 431 BC (2.18, 2.19.1, 2.22.3), 430 BC (2.47.2, 2.55.1, 2.57.1-2), 428 BC (3.1.1), 427 BC (3.26.1-4), 425 BC (4.6), 413 BC (7.19.1).

<sup>594</sup> Trédé (1992) 149, the opposition of *kairos* and *tyche* was also present in the medical writers, "*kairos*'s' oppose ἀ τύχη". For *tyche* and the divine as well as necessity and nature, see esp. 5.104-105.

In negotiation one player responds to the other, both in temporal and in informational terms. Much like in wall-construction, one player builds on the front on which he sees the opponent is building. However, there are instances in which there is foresight. One player's informational situation precedes that of his opponent.

Recall in Chapter 1 that Archidamos devised a plan that when the Spartan army came into view of the Athenians, the Athenians would be divided on whether to fight or remain behind their walls. Pericles, knowing that the Athenians under these conditions were more likely to vote for an attack, did not call an assembly. He prevented the *demos* from possibly making a mistake. Pericles knows it is a mistake to attack, before the Athenian demos knows it is a mistake. During the Peloponnesian war, surprise attacks are pervasive, or equally as likely, of strategic importance to Thucydides himself. Surprise attacks can be divided into categories, such as attacks by night, by dawn, by day, by sea and ambushes.<sup>595</sup>

Surprise attacks are considered a notoriously controversial subject in current scholarship.<sup>596</sup> Surprise attacks are seen to be at odds with the unwritten conventions of war, usually referred to as the “rules of war”<sup>597</sup> or *agon*<sup>598</sup>, which would establish equality between opponents before a contest. Thucydides in his presentation of surprise attacks as I see it describes the interaction as no “less agonistic” than any other *agon*,<sup>599</sup> since information is available but is neglected. The single common defining element, I believe Thucydides identified as primary among this type of interaction, was the knowledge distribution among players. The most important difference between ‘open and fair’ battles was the asymmetry

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<sup>595</sup> Pritchett (1974) 165-189; Sheldon (2012).

<sup>596</sup> For the two most opposing positions: Pritchett (1974) 156ff., on “the infrequency of surprise attacks on Greek hoplite armies and in particular Greek camps” and Sheldon (2012) esp. 53, “It seems a bit ironic, perhaps even surprising, that one can fill so many chapters with accounts on an activity that supposedly never happened in ancient Greek warfare.”

<sup>597</sup> Sheldon (2012) 42f. and the emergence of light-armed troops, see *HCT* 1.10; Ober (1996) for a list of “rules” which are better read as a list of unwritten customs which appear after the Homeric epic and breakdown during the Peloponnesian war.

<sup>598</sup> Heza (1974) 229.

<sup>599</sup> Heza (1974) 232.

**between one player's knowledge of the other's movements.** In this type of dynamic interaction, players do not share common knowledge of the game being played.<sup>600</sup>

For a very simple example, say there is a sealed auction and two bidders submit bids. The first bidder submits his bid today and the second submits his bid tomorrow, there is temporal sequence but informational simultaneity. If the first bidder knows about the bid of the second before he submits his bid, there is informational priority with an inverse temporal sequence. If Archidamos had devised a plan in which his opponent was Pericles and not the *demos*, there would be no weakly dominant strategy, and instead a dominant strategy to be passive. Cases for informational priority occur when decision-makers are able to foresee mistakes or surprises. Both mistakes and surprises are anticipated by agents with accurate information or by agents who possess an innate or superior “intelligence” (*xunesis*).

### ***The Speech of Teutiaplus***

In modern military terminology a surprise attack is called a “first strike”, but in fact a surprise attack is a second move.<sup>601</sup> If a player has accurate information, then he can choose to let time go by so that the opponent discovers his state of mind (*his plot*) or act as soon as possible on this knowledge asymmetry.<sup>602</sup> In the case of a surprise attack, the player who moves second has gained *accurate information* about the other player's state of mind.<sup>603</sup> The anticipating player uses this information to make his

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<sup>600</sup> Harsanyi (1986), a Nobel prize in Economics for the mathematization of this idea “Games of incomplete information can be thought of as games of complete but imperfect information where nature makes the first move ... [distributing probabilistic information about the players], but not everyone observes nature's move ...[not everyone knows all the different types]” Game theory usually sets up the game with the focalizer as the player who does not possess the other's private information. In Thucydides formulation, the focalizer is the player with the private information. Instead of me trying to buy a car, and deciding whether the salesman is telling me the truth or not about the value of the car, *here* the car salesman knows the value of the car and is pitching a value to someone who does not know its value.

<sup>601</sup> Tsebelis (1989) 6f; Roisman (1993) 71-74, on modern observations, but does not note the concept of “first strike”, he instead focuses on the importance of intelligence.

<sup>602</sup> Tsebelis (1989) 6 and 23 “If a player has accurate information about an opponent's strategy, then she is in fact moving second in the game.”

<sup>603</sup> Russell (1999), on information gathering in classical Greece.

move; he formulates his strategy as if he were moving second in a game (e.g. as if he knew the other bidder's bid) In this case, the way two players behave depends on informational and not temporal priority.

Teutiaplus describes the strategy of **surprise** or the case in which **the state of the world is unknown to one player**. The Athenians are unaware of a Spratan fleet sailing to Mytilene (λανθάνουσι). The Spartan fleet is informed of Athens' victory at Mytilene at Icarus and Mykonos and travel to Embaton wishing to be sure and confirms the information (βουλόμενοι δὲ τὸ σαφὲς εἰδέναι ... πυθόμενοι δὲ τὸ σαφὲς, 3.29).<sup>604</sup> Once confirmed, Teutiaplus makes the following suggestion.

Ἀλκίδα καὶ Πελοποννησίων ὅσοι πάρεσμεν ἄρχοντες τῆς στρατιᾶς, ἐμοὶ δοκεῖ πλεῖν ἡμᾶς ἐπὶ Μυτιλήνην **πρὶν ἐκπύστους γενέσθαι**, ὕσπερ ἔχομεν. **κατὰ γὰρ τὸ εἰκὸς** ἀνδρῶν νεωστὶ πόλιν ἔχοντων πολὺ **τὸ ἀφύλακτον** εύρήσομεν, κατὰ μὲν θάλασσαν καὶ **πάνυ**, ἢ ἐκεῖνοι τε **ἀνέλπιστοι ἐπιγενέσθαι ἢν τινα σφίσι πολέμιον** καὶ ἡμῶν ἡ ἀλκὴ τυγχάνει μάλιστα ούσα: **εἰκὸς** δὲ καὶ τὸ πεζὸν αὐτῶν κατ' οἰκίας **ἀμελέστερον** ὡς **κεκρατηκότων** διεσπάρθαι. εἰ οὖν προσπέσοιμεν **ἄφνω τε καὶ νυκτός, ἐλπίζω** μετὰ τῶν ἔνδον, εἴ τις ἄρα ἡμῖν ἐστίν ὑπόλοιπος εὔνους, **καταληφθῆναι ἢν τὰ πράγματα**, καὶ μὴ ἀποκνήσωμεν τὸν κίνδυνον, νομίσαντες οὐκ ἄλλο τι εἶναι **τὸ καινὸν τοῦ πολέμου**<sup>605</sup> ἢ τὸ τοιοῦτον, ὃ εἴ τις στρατηγὸς ἔν τε αὐτῷ φυλάσσοιτο καὶ τοῖς πολεμίοις ἐνορῶν ἐπιχειροίη, πλεῖστ' ἢν ὄρθοῖτο.'

Alcidas, and the rest in command of the Spartan army, it is my opinion that we go to Mytilene as we are, **before our arrival is known**. **For in all probability** we shall find that men who have recently gained

<sup>604</sup> Wilson (1981) 148-9, *to saphes* implies "detailed information" (his italics).

<sup>605</sup> Sheldon (2012) 83-4; Heza (1974) 233-235; N.B. **τὸ καινὸν** is preferred by the Alberti edition, which follows the majority of the manuscripts. However, these manuscripts are possibly all part of one branch of the *stemma codicum*. *Vide* the OCT which prefers **τὸ κενὸν**. Another rather less preferred tradition is **τὸ κοινὸν**. In Aldus Manutius' first edition of Thucydides *Historiae Peloponnesiae* his *Demegoria Teutiaplou* has **τὸ καινὸν**. This is important because we know that Aldus considered himself a manuscript editor above all and destroyed many manuscripts during the production of his first editions. He did not possess the sense of preservation that we do now, yet his choice adds to the validity of the translation as "newness". Thucyd., [Historiae Peloponnesia.] Venice, Aldus, 1502, f.Eiiiv, lin.8. is held at the British Library under rare books. I am grateful to Paolo Sachett for pointing this out to me.

possession of a city will be not guarded at all, and entirely so at sea, (on which front **they do not expect the attack of an enemy**, and where at this moment we have the advantage). **It is also likely** that their land soldiers are dispersed, some in one house and some in another, carelessly as victors. If we attack **suddenly** by night, I hope with traitors inside or someone who is left behind on our side, we should bring this affair to an end. Let us then not shrink from the risk, and realize that this [tactic] is nothing else than **the newness of war**, or to other such things, which if a general guards against himself and [by using it] takes the enemy by observing him, he will act in the far most correct way. (3.30.1-4)

The common case when a player is not aware of the opponent's plot is that he is unguarded. One player believes the state of the world has changed, while the other player remains unguarded because of incomplete information about this new state of the world, which requires *accurate foresight*. Characters may also have some information he does not want to share: such as location. When Teutiaplus reveals the state of the world (i.e. we know that they don't know that we have a fleet), he begins to make a probabilistic conjecture (*εικὸς*) of what might be the state of mind of the opponent (i.e. unguarded and negligent, *τὸ ἀφύλακτον ... ἀμελέστερον*). A surprise attack requires that the opponent be unguarded and disorganised, otherwise there is no element of surprise since 'something' is expected.

For this very reason, Teutiaplus tells us that a general should exploit the newness or novelty of war and also guard against it. That is to say that, surprise attacks should be not only exploited, but also expected. Expectations are formulated from information gathering by means of espionage, surveillance and reconnaissance.<sup>606</sup> Although the agents who collect information are often implicitly mentioned in Thucydides,<sup>607</sup> players

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<sup>606</sup> Russell (1999) 10-62, for ancient espionage and surveillance. He studies the agents and sources of accurate information "to prevent a surprise or ambush by the enemy". "The bulk of the information was ephemeral since it often consisted of enemy dispositions that were rarely static". Two modes of tactical intelligence: surveillance and reconnaissance. Reconnaissance involves movement whilst surveillance is usually sedentary. Agents are called *skopoi* and *phulakes*. By land: 10-19. By sea: a single vessel (19f.) e.g. Thuc. 6.50.4.

<sup>607</sup> e.g. implicit intelligence: 1.57.6; 1.116.3; 3.16.1; 3.96.3; 8.26.1, 27.1; 8.41.3-4; 8.103.2.

make conjectures based upon information furnished by these agents and act upon it. In the modern world, this is the fundamental principle governing the institutional approach to national security as seen in the conduct of intelligence agencies, which dedicate themselves to discovering unknown threats and exploit other state's unpreparedness to a threat.<sup>608</sup> Players must be well informed, not to be well informed is an active choice to be negligent. One could expect careless security on the part of a recent victor or during peace time.<sup>609</sup>

### ***Theban seizure of Plataea***

The Theban seizure of Plataea is a prime exemplar.

τέσσαρα μὲν γὰρ καὶ δέκα ἔτη ἐνέμειναν αἱ τριακοντούτεις σπονδαὶ ... προϊδόντες γὰρ οἱ Θηβαῖοι ὅτι ἔσοιτο ὁ πόλεμος ἐβούλοντο τὴν Πλάταιαν αἱεὶ σφίσι διάφορον οὖσαν ἔτι ἐν εἰρήνῃ τε καὶ τοῦ πολέμου μήπω φανεροῦ καθεστῶτος προκαταλαβεῖν. Ἡ καὶ ὁδὸν ἔλαθον ἐσελθόντες, φυλακῆς οὐ προκαθεστηκίας.

For fourteen years the thirty years' peace which was concluded after the recovery of Euboea remained unbroken. ... [the Thebans find traitors within Plataea to open the gates for them at night] ... There was an old quarrel between the two cities, and the Thebans, foreseeing that there would be a war, were anxious to seize the place while the peace lasted and before (pro) war had openly broken out. No guard had been set before hand (pro); in this way they were able to enter the city easily unperceived. (2.2.3)

The Thebans realize that the Plataeans are making a mistake to act as if the peace still held.<sup>610</sup> The Thebans are in possession of *accurate information* (they foresee via conjecture: *proidontes*)<sup>611</sup> that they are in a state of war,

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<sup>608</sup> Another analogous example is that ignorance of the law "through negligence" is punishable, Arist. *EN*. 1113b33-1114a2.

<sup>609</sup> Russell (1999) 23ft.48.

<sup>610</sup> Russell (1999) 13, 23-24

<sup>611</sup> Russell (1999) 13ft.9.

albeit not openly. Had the Plataeans also foreseen that they were in a state of war, the Plataeans would have had a guard set up. Thucydides tells us that “they had not set up a guard before hand”: *prokathestekuias*. On account of their own oversight, the Plataeans choose not to put a guard on watch, which thus facilitated the entry of the Thebans into the city unobserved.

Teutiaplus plots a surprise attack with an *eikos*-argument and the Theban plot requires foresight. A prediction using arguments from probability that turns out to be accurate is foresight. Predictive thinking is characteristic of players who use information to make conjectures. Themistocles ‘could best conjecture’ (ἀριστος εἰκαστής) and possesses ‘innate intelligence’ (οἰκεία ξυνέσει, 1.138.2-3)<sup>612</sup> and Pericles showed ‘foresight’ (πρόνοια, 2.65, c.f. 2.34). Others like Theseus, the Pisistradids, Brasidas (3.108.2-3) Hermocrates (4.61.5), Phrynicus (8.27), the oligarchs of 411 generally (8.68.3-4) and the Scythians (2.97.6) are noted for their ‘intelligence’ (*xunesis*) as well. Although this form of strategy is characteristic of agent’s with foresight and/or intelligence,<sup>613</sup> there was no guarantee of a victory.

The general Demosthenes employed surprise attack tactics in all his military operations and experienced both successes and defeats.<sup>614</sup> He is shown to exploit (4.32) and also guard against surprise attacks (4.30). He was successful, when he launched his light-armed troops at dawn against the Spartans on the island of Sphacteria.<sup>615</sup> He was defeated, when he led the night attack to take back Epipolae at Syracuse.<sup>616</sup> Demosthenes best

<sup>612</sup> CT 1.222-3, “Rhetoric was a secular mode of divination, probing past and future by the light of probability. ... doctors as well as rhetoricians – like Themistokles and Pericles ... for their *explanatory* gifts - laid claim to ‘divination’. [c.f. Euripides’ Fr.973] Th.’s praise of Themistokles is couched in thoroughly secular and sophistic terms.” (Hornblower’s italics) see 2.60.5 on Pericles’ ability to explain ‘the right thing to be done’ τὰ δέοντα as well.

<sup>613</sup> CT 1.124-125 for bibliography; Huart (1968) 49-54, σύνεσις is equivalent to γνώμη, which means ‘the result of the act of thinking’, such as a ‘decision’ or ‘practical resolution’. The term σύνεσις adds to the idea of ‘decision’ the idea of ‘intelligence’ as it pertains to ‘a clear view of situation’. It requires the additional abstract idea of sight. Intelligence is defined as the ability to take decisions with foresight.

<sup>614</sup> Roisman (1993) 11-32.

<sup>615</sup> Roisman (1993) 33-41, 71.

<sup>616</sup> Roisman (1993) 52-70.

demonstrates the risky results of surprise attacks (*tuche*, 3.97.1-2).<sup>617</sup> Pericles had well advised that intelligence is often off-set by the “stupidity” (*amathos*) of chance (1.140.1, c.f. 5.75.3).<sup>618</sup>

Apart from chance, one reason why a surprise attack may not be successful is the use and dissemination of **inaccurate information**. Harmodius and Aristogeiton had a plot to attack Hippias by surprise, but once they see him speaking to a conspirator, they wrongly assume the plot is revealed. Harmodius and Aristogeiton acquired inaccurate information through a misguided conjecture. Nonetheless, their immediate reaction is to seek to accomplish *something before they are arrested*. A way to ensure your opponent has inaccurate information is by feigning an information-leak.<sup>619</sup> Two cases immediately come to mind. The Athenian generals send a Katanian man with a fictitious message to the Syracusan generals (τοιόνδε τι ... μηχανῶνται, 6.64.2). Hermocrates devises a trick (αὐτὸς ἐπὶ τούτοις τάδε μηχανᾶται, 7.73.3)<sup>620</sup> to dissuade the Athenians from retreating into Sicily while the Syracusan troops are commemorating their victory in the sea-battle. At Syracuse, Nicias receives information which he believes is genuine and does not retreat with the army (7.73.1-3, 74.1). In the case a player receives inaccurate information, a misinformed player therefore moves second.<sup>621</sup>

In sum, a dynamic game whose plot is unknown to the opponent is characterised by a **struggle for followership**, that is to say, the player with *accurate information* acts at any point during this state.<sup>622</sup> (See Figure U)

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<sup>617</sup> Roisman (1993) 13.

<sup>618</sup> Edmunds (1975).

<sup>619</sup> Heza (1974) 242.

<sup>620</sup> *CT* 3.105-6, Schindel (1970) 285-84; list of tricks: (with τοιόνδε τι) 2.75.6; 4.46.4; 5.45.1-2; 6.64.1; 8.50.1; (others) 5.18, 45, 47; 6.38; 6.77.2; 7.25; 7.73.3; 8.56.2. C.f. *CT* 3.647 on contriving counter-measures.

<sup>621</sup> Tsebelis (1989) 21.

<sup>622</sup> List of Surprise attacks: 1.115.4, 117; 2.2.1, 3.1, 5.4, 48 (*disease*), 82, 83.3, 92.6, 93.4; 3.3, 22, 30.2, 34, 70, 74.3, 81.1, 91.3, 106.3, 112.1-5; 4.25, 26.1-8, 28.4, 31, 32.1, 36.2 (see 40), 42.4, 67, 70, 103.4, 103.5, 110.1, 120.2, 125.1, 131.3, 135; 5.8.2-4, 9.1-10, 10.7, 58.2, 115.4; 6.7.2, 65.2, 97.1; 7.4.2, 6.4, 22, 23.1 43-44, 73, 80, 83.5; 8.28.2, 35.4, 41-42, 101, 102.

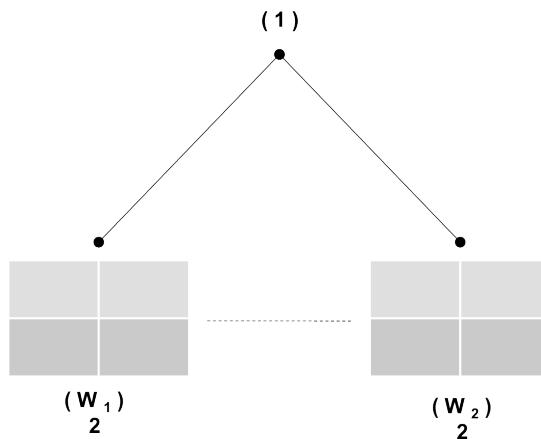


Figure U

In the Figure, Player 1 does not know the state ( $w_1$  or  $w_2$ ) represented by the dotted line between both possible games. Player 2 on the other hand knows which state of the world they are both in. A player who has a plot for a surprise attack moves with *informational and temporal priority*. This from of structured reading helps us to more clearly understand Thucydides' chronology of 'beginnings' (ἀρχέται). Thucydides has been said to imply that the invasion of Plataea constitutes the beginning of the war, since he prefaces the event with "six indicators of date to give solemnity to the first event of the war proper."<sup>623</sup> In bk 7 he again implies that Plataea was the beginning. In an authorial comment, Thucydides writes (7.18.2):

ἐν γὰρ τῷ προτέρῳ πολέμῳ σφέτερον τὸ παρανόμημα μᾶλλον γενέσθαι, ὅτι τε ἐξ Πλάταιαν ἥλθον Θηβαῖοι ἐν σπονδαῖς, καὶ εἰρημένον ἐν ταῖς πρότερον ξυνθήκαις ὅπλα μὴ ἐπιφέρειν

In the former war the fault of transgression was more on their [the Spartans'] side, in that Thebans had entered Plataea while a treaty was in force.

It is not the action to take Plataea by surprise which constituted the beginning of the war, but the plan to do so "during the treaty" which

<sup>623</sup> CT 1.236.

constitutes the beginning. The conceptualisation of the action begins this type of game and as a result the Peloponnesian war itself.<sup>624</sup> This reading lends further support to the suggested deletion of the words ἡ ἐσβολὴ ... καί at 5.20 that identified the invasion of Attica as the beginning of the war.<sup>625</sup> A player who has a plot for a surprise attack moves with *informational and temporal priority*, yet the game begins as a simultaneous move with one player's realization of a change of state.

For the case when the plot is revealed both players know the state. They possess *informational simultaneity*, but seek to move with *temporal priority*. Once, the opponent knows about the plot, the game is characterised by a **struggle for leadership**; the player wants to act before the other. The capture of a strategic position is the most frequent example of a struggle for leadership: Eion (4.106-107), Amphipolis (4.108.1), Epipolae (6.96-97.1) and Scione. When both know the state they are in, there is a first mover advantage and thus a struggle for leadership. The most elaborate description of a struggle for leadership is Phrynicus' clever trick in book 8, chapters 50 and 51. Here, Thucydides elucidates how Phrynicus gathers intelligence, albeit one signal, and employs his only weapon information itself to misinform his opponent Alcibiades.

### ***Phrynicus Updates his Beliefs***

Phrynicus reveals all his sagacity (*xunesis*, 8.27.5) by setting his wits against those of Alcibiades (8.50-51). Thucydides introduces the episode with a familiar formula for a clever trick: *trepetai epi toionde ti*. What 'device'

<sup>624</sup> Rood 84-8, esp. 86; Pritchett (1986); CT 1.236-8, 2.490-3, 3.573-4, bibliography and debate.

<sup>625</sup> CT 2.490, cf. the seizure of Euboea as the beginning of the Thirty Years Peace (1.115, 1.23.4) and "the events at Plataea" as the beginning of the war (2.19.1); Regarding, the formal statement before the first invasion of Attica (2.19), Classen may be right to delete the words in brackets "about the eighteenth day after [the entry of the Thebans into] Plataea" (οὗτω δὴ ὥρμησαντες ὅπ' αὔτης μετὰ τὰ ἐν Πλαταιᾷ [τῶν ἐσελθόντων Θηβαίων] γενόμενα, 2.19.2) This would allow for a more vague chronological statement, "after the events at Plataea"; Hornblower notes that "the sense intended is the same", CT 1.272.

did Phrynicus have recourse to? There are two stages of decision-making; Phrynicus' first and second secret letters to Astyochus. These stages can be more clearly identified as a single mental calculation instead of a pair of actions, whereby Phrynicus 'updates his beliefs' about his opponents.<sup>626</sup> Phrynicus sets a ploy in motion by sending Astyochus the same type of information. Scholarly literature, not surprisingly, has often focused on the mental faculties of the agents involved in the episode.<sup>627</sup> Phrynicus predicts that Alcibiades will inform the Athenians at Samos of his 'treachery' a second time. (8.51) As such, it is not so much the mental abilities of his opponents that will determine the success of Phrynicus' trick, but rather what Phrynicus himself can induce his opponents to do given his updated beliefs about his opponents.

Thucydides tells us a story of intrigue and deception. Phrynicus, the Athenian general at Samos, is against the ongoing negotiations to recall Alcibiades from exile, back to Athens. In exchange for his recall, Alcibiades promises the Athenians that he will shift the financial support of the Persian King away from Sparta and toward Athens through Tissaphernes, one of the Persian satraps. The commitment of the Athenians at Samos to the recall of Alcibiades forces Phrynicus to take matters into his own hands.

γνοὺς δὲ ὁ Φρύνιχος ὅτι ἔσοιτο περὶ τῆς τοῦ Ἀλκιβιάδου καθόδου λόγος καὶ ὅτι Ἀθηναῖοι ἐνδέξονται αὐτήν, **δείσας** πρὸς τὴν ἐναντίωσιν τῶν ὑφ' αὐτοῦ λεχθέντων μῆ, ἣν κατέλθη, ὡς κωλυτὴν ὅντα κακῶς δρᾶ, **τρέπεται ἐπὶ τοιόνδε τι.**

Phrynicus now knew that a proposal would be made for the restoration of Alcibiades, which the Athenians would certainly accept; and having opposed his return he **feared** that Alcibiades, if he were recalled, would do him a mischief, because he had stood in his way. **So he had recourse to the following device.** (8.50.1)

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<sup>626</sup> Lang (1996), notes that "the letter was only one possible action out of several".

<sup>627</sup> Westlake (1968); Schindel (1970); Van de Maele (1971); Bloedow (1991) 'Phrynicus the "intelligent" Athenian'; Falkner (1999) 'Astyochus, Sparta's Incompetent Navarch?'.

Phrynickus sends a secret letter to Astyochus, the Spartan general at Miletus, telling him about the Athenian negotiations with Alcibiades. Astyochus passes this information on to Alcibiades and also to Tissaphernes. Alcibiades reacts by sending a letter to Samos demanding that Phrynickus be executed for treason.

πέμπει ὡς τὸν Ἀστύοχον τὸν Λακεδαιμονίων ναύαρχον ἔτι ὄντα τότε περὶ τὴν Μίλητον **κρύφα** **έπιστείλας** ὅτι **Ἀλκιβιάδης** αὐτῶν **τὰ πράγματα** φθείρει Τισσαφέρνην Ἀθηναίοις φίλον ποιῶν, καὶ τάλλα πάντα σαφῶς ἐγγράψας: ξυγγνώμην δὲ εἶναι ἔαυτῷ περὶ ἀνδρὸς πολεμίου καὶ μετὰ τοῦ τῆς πόλεως ἀξυμφόρου κακόν τι βουλεύειν. .... ὁ δὲ Ἀλκιβιάδης εύθὺς πέμπει κατὰ Φρυνίχου γράμματα ἐξ τὴν Σάμον πρὸς τοὺς ἐν τέλει ὄντας **οἴδα δέδρακε**, καὶ ἀξιῶν αὐτὸν ἀποθνήσκειν.

He secretly sent a letter to Astyochus, the Spartan admiral, who was still at Miletus, informing him that Alcibiades was gaining over Tissaphernes to the Athenians and ruining the Peloponnesian interests. He gave full particulars, adding that Astyochus must excuse him for plotting against a personal enemy even at the cost of his country's interest. .... Alcibiades immediately sent a letter denouncing to the authorities at Samos what Phrynickus had done, and demanding that he should be put to death.

Phrynickus quickly sets up a ploy and sends a second secret letter to Astyochus. In it Phrynickus censures Astyochus for not keeping the first letter secret and provides detailed information on the status of Athenian defences at Samos and that Samos was unfortified. The reason for this, he informs Astyochus, is because he was now in great danger and needed to destroy his enemies in Samos. Astyochus again passes on this information to Alcibiades. However, having sent the second letter, Phrynickus quickly fortifies Samos. Alcibiades again reacts by sending another letter to Samos warning of an imminent enemy attack instigated by Phrynickus' second letter. The Athenian army disregards Alcibiades' plea to see Phrynickus

killed because they believe that Alcibiades is acting out of personal enmity toward Phrynicus.<sup>628</sup>

The interaction between Phrynicus and Alcibiades has been called “a duel of wits”, “a game of chess”<sup>629</sup> and “a case of diamond cut diamond”<sup>630</sup> in which “Alcibiades was entirely outmaneuvered”<sup>631</sup>. This has left Astyochus to play the role of the dimwitted informer.<sup>632</sup> The battle of wits between Phrynicus and Alcibiades is only made possible by the secret communication couriered through Astyochus. Schindel argues that Phrynicus knows about Astyochus’ role as an informer, since the first *menuis* (at 50.5).<sup>633</sup> This is Thucydides’ signpost. Thucydides elsewhere calls Astyochus a *menutes*, a most unequivocal description of an informer. Phrynicus’ beliefs about Astyochus’ motivations are the key to the game between Phrynicus and Alcibiades.

Whether Phrynicus in actuality had a political motivation, namely to prevent the recall of Alcibiades (8.48.4-7), or a private motivation to prevent a personal enemy (*exhistos*) from returning to Athens is not relevant for the trick. The problem, which needs solving, only arises after Phrynicus’ life is at risk when the first letter is revealed to the Athenians at Samos. The trick is meant to solve the threat to his life and not to decide whether Alcibiades is recalled or not.<sup>634</sup> The first letter was meant to stop Alcibiades’ negotiations with the Athenians. When Astyochus informs Alcibiades, Phrynicus is disturbed (Θορυβούμενος, 8.50.5). Phrynicus must devise a trick to return his reputation in the Athenian camp to what it was before (the *status quo*)<sup>635</sup> or turn this mistake to his advantage. He expected Astyochus to punish Alcibiades before. Now, after Astyochus shows himself to be an

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<sup>628</sup> de Romilly (1995) 159-161, writes “Alcibiade n'est plus cru, comme, à force de crier au loup”.

<sup>629</sup> CT 3.901-902 for these two phrases.

<sup>630</sup> Hammond (1977) 147; CT 3.ad loc.

<sup>631</sup> Bloedow (1991) 150.

<sup>632</sup> Falkner (1999).

<sup>633</sup> Schindel (1970) 291.

<sup>634</sup> Schindel (1970) 285-86.

<sup>635</sup> de Romilly (1995) 161, believes he returns the situation to the *status quo*.

informer, Phrynicus expects him to pass on the message again to Alcibiades. The trick begins with the second letter.

It is because of the uncertainties involved in who will be the recipients of the first letter, that the second letter is devised, through the process of updating. The update itself is simple: Phrynicus is informed by default that Alcibiades did not fall within Astyochus' reach and sold himself to Tissaphernes for private gain (8.50.3). Phrynicus needs to persuade Alcibiades to reveal his treacherous message again.

First, Westlake notes that his second letter, like Phrynicus' first letter, had to convey that, "Phrynicus acted wholly through fear for his own safety".<sup>636</sup> Phrynicus in his first letter writes that Astyochus must excuse him:

ξυγγνώμην δὲ εἶναι ἔσυτῷ περὶ ἀνδρὸς πολεμίου  
καὶ μετὰ τοῦ τῆς πόλεως ἀξυμφόρου κακόν τι  
βουλεύειν.

For plotting against a personal enemy even at the cost of his country's interest (8.50.2)

In his second letter he again states that:

καὶ ὅτι ἀνεπίφθονόν οἱ ἥδη εἴη περὶ τῆς ψυχῆς δι'  
ἐκείνους κινδυνεύοντι καὶ τοῦτο καὶ ἄλλο πᾶν  
δρᾶσαι μᾶλλον ἢ ὑπὸ τῶν ἐχθίστων αὐτὸν  
διαφθαρῆναι.

Since his life was in danger for their sakes, no one could blame him for doing this [i.e. betraying the Athenian army] or anything else to escape being destroyed by his greatest enemies. (8.50.5)

Whereas in the first letter he feared Alcibiades, in the second letter he fears private enemies in his own camp.<sup>637</sup> By updating his beliefs about Astyochus, Phrynicus sets a ploy in motion and sends Astyochus the same type of information (i.e. fear for his safety) with a different target (i.e. not the

<sup>636</sup> Westlake (1956) 100.

<sup>637</sup> Steup note ad loc

Spartans, but Alcibiades). This is a rhetorically necessary ingredient that produces *peitho*. It redefines patriotism and is characteristic of Alcibiades; private interests precede public interests. Phrynicus in his letters to Astyochus uses variations of Alcibiades' famed excuse at Sparta. Alcibiades argued then that:

καὶ πολεμιώτεροι οὐχ οἱ τοὺς πολεμίους που  
βλάψαντες ὑμεῖς ἢ οἱ τοὺς φίλους ἀναγκάσαντες  
πολεμίους γενέσθαι.

The greater enemies of my country are not like you  
who have damaged it in open war, but the people  
who have forced its friends to become its enemies.  
(6.92)

Phrynicus accuses Alcibiades of seeking a change of government because it promotes his private interests.

καὶ τοῖς μὲν ἄλλοις ἐφαίνετο εὔπορα καὶ πιστά,  
Φρυνίχῳ δὲ στρατηγῷ ἔτι ὄντι οὐδὲν ἥρεσκεν, ἀλλ᾽  
ὅ τε Ἀλκιβιάδης, ὅπερ καὶ ἦν, οὐδὲν μᾶλλον  
όλιγαρχίας ἢ δημοκρατίας δεῖσθαι ἐδόκει αὐτῷ οὐδ᾽  
ἄλλο τι σκοπεῖσθαι ἢ ὅτῳ τρόπῳ ἐκ τοῦ παρόντος  
κόσμου τὴν πόλιν μεταστήσας ὑπὸ τῶν ἑταίρων  
παρακληθεῖς κάτεισι, ... καὶ ταῦτα παρ' αὐτῶν τῶν  
ἔργων ἐπισταμένας τὰς πόλεις σαφῶς αὐτὸς εἰδέναι  
ὅτι οὕτω νομίζουσιν. οὔκουν ἔσυτῷ γε τῶν ἀπ'  
Ἀλκιβιάδου καὶ ἐν τῷ παρόντι πρασσομένων  
ἀρέσκειν οὐδέν.

Phrynicus, who was still general, was of another mind. He maintained, and rightly, that Alcibiades cared no more for oligarchy than he did for democracy, and in seeking to change the existing form of government was only considering how he might be recalled and restored to his country at the invitation of the clubs; ... Experience had taught the cities this lesson, and he was well aware of their feelings. He was therefore himself utterly dissatisfied with the proposals of Alcibiades, and disapproved of the whole affair. (8.48.4-7)

Phrynicus in fear of Alcibiades opposes oligarchy in his speech to prevent his recall. But later he comes to promote oligarchy with zeal for fear of Alcibiades, once he is recalled.

παρέσχε δὲ καὶ ὁ Φρύνιχος ἐαυτὸν πάντων διαφερόντων προθυμότατον ἐς τὴν ὀλιγαρχίαν, δεδιώκ τὸν Ἀλκιβιάδην καὶ ἐπιστάμενος εἰδότα αὐτὸν ὅσα ἐν τῇ Σάμῳ πρὸς τὸν Ἀστύοχον ἐπραξε, νομίζων οὐκ ἄν ποτε αὐτὸν κατὰ τὸ εἰκὸς ὑπὸ ὀλιγαρχίας κατελθεῖν: πολύ τε πρὸς τὰ δεινά, ἐπειδήπερ ὑπέστη, φερεγγυώτατος ἐφάνη.

Phrynicus also showed extraordinary zeal in the interests of the oligarchy. He was afraid of Alcibiades, whom he knew to be cognisant of the intrigue which when at Samos he had carried on with Astyochus, and he thought that no oligarchy would ever be likely to restore him. Having once set his hand to the work he was deemed by the others to be the man upon whom they could best depend in the hour of danger. (8.68.3)

Phrynicus is also outright persuasive. He refuses to help his colleagues engage the enemy at Miletus.<sup>638</sup>

καὶ οἱ μὲν ἄμα τῇ ἔω ἔμελλον βοηθήσειν: Φρύνιχος δὲ ὁ τῶν Ἀθηναίων στρατηγός, ὡς ἀπὸ τῆς Λέρου ἐπύθετο τὰ τῶν νεῶν σαφῶς, βουλομένων τῶν ξυναρχόντων ὑπομείναντας διαναυμαχεῖν, **οὐκ ἔφη** οὔτ' αὐτὸς ποιήσειν τοῦτο οὔτ' ἐκείνοις οὐδ' ἄλλω οὐδὲνὶ ἐς δύναμιν ἐπιτρέψειν. ... **ώς δὲ ἔπεισε, καὶ** **ἔδρασε ταῦτα**: καὶ ἔδοξεν οὐκ ἐν τῷ αὐτίκα μᾶλλον ἡ ὕστερον, οὐκ ἐς τοῦτο μόνον, ἀλλὰ καὶ ἐς ὅσα ἄλλα Φρύνιχος κατέστη, **οὐκ ἀξύνετος** εἶναι.

They determined to go at daybreak and relieve the place. But Phrynicus the Athenian general had certain information from Leros of their approach, and, although his colleagues wanted to remain and risk a battle, **he refused** and declared that he would **neither himself fight, nor allow them or any one else to fight if he could help it.** ... His advice was followed [**he persuaded them and acted accordingly**] And not on this occasion only, but quite as much afterwards, whenever Phrynicus

<sup>638</sup> CT 3.826

had to act, he showed himself to be a man of great sagacity. (8.27)

This refusal is not binding, but there is definiteness to the statement.<sup>639</sup> Phrynicus is able to carry out his refusal because “he persuaded them, and acted accordingly”. Alcibiades and Phrynicus share this rhetorical skill.

Phrynicus already in his first letter informs Astyochus that he himself possesses this form of thinking, so characteristic of Alcibiades. Perhaps Phrynicus’ use of Alcibiades’ characteristic rhetorical ‘patriotism’ is Thucydides’ sign post of Phrynicus’ knowledge of a type of argument peculiar to agents with self-serving profit-seeking behaviour. For Alcibiades, as it was for Phrynicus, private interests weighed heaviest, and one used his own ways to predict the other’s reaction. Alcibiades chose to follow his private interest with a second attempt to rid himself of an enemy, which allowed Phrynicus to align his private interest with his public interest, a rarity even today. Phrynicus expected a letter, not an attack on Samos. By serving his public interest, informing the troops of information he had acquired about an attack on un-fortifying Samos, he was able to discredit Alcibiades for his personal benefit.

καὶ ὡς προήσθετο αὐτὸν ὁ Φρύνιχος ἀδικοῦντα καὶ  
ὅσον οὐ παροῦσαν ἀπὸ τοῦ Ἀλκιβιάδου περὶ  
τούτων ἐπιστολήν.

Phrynicus forsaw Astyochus continued betrayal and that a letter on the subject could be expected any moment from Alcibiades. (8.51.1)

Samos was fortified not by the true foresight of an impending attack, but because of an impending attack forestalled. Thucydides gives Phrynicus faint praise by mentioning that fortifying Samos had already been on the Athenian agenda.

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<sup>639</sup> Dover 1988 173ff, CT 3.826.

καὶ οἱ μὲν τὸν τειχισμόν τε παρεσκευάζοντο καὶ ἐκ  
τοῦ τοιούτου, καὶ ὡς μέλλουσα, Σάμος θᾶσσον  
έτειχίσθη

The Athenians set to work at the fortifications and so, as a result of all this, Samos, which would have been fortified in any case, was fortified all the sooner. (8.51.2)

Astyochus and Alcibiades must believe Phrynicus will continue to act in his private interest to the detriment of his state. Phrynicus sent inaccurate information with this content to Alcibiades through Astyochus. “A misinformed player moves first (trying to react to what the situation is according to his mistaken beliefs) and give the opportunity to the opponent to move second”.<sup>640</sup> By holding Alcibiades’ beliefs about himself unchanged, Phrynicus induces Alcibiades to repeat his reaction, which was to denounce his treasonous message a second time. This is what Phrynicus “himself anticipated” (αὐτὸς προφθάσας, 8.51.1).

### **What about Astyochus?**

Since Phrynicus’ actions drive the episode, this analysis concentrated on his beliefs and behavior. The literature has often focused on the intellectual abilities of the agents: Thucydides’ praise for Phrynicus,<sup>641</sup> and Astyochus’ implicit incompetence<sup>642</sup>. It appears to me that the opposition of the personal versus political considerations is what lies at the heart of the episode and discovering whether an actor is swayed further one way than

<sup>640</sup> Tsebelis (1989) 21.

<sup>641</sup> Shrewd, 27.5 Φρύνιχος κατέστη, οὐκ ἀξύνετος εἶναι. “And not on this occasion only, but quite as much afterwards, whenever Phrynicus had to act, he showed himself to be a man of great sagacity”; Sealey (1970) 115, “subsequent events showed that Phrynicus views were right (cf. 8.64.2-5) one of the masterminds of the coup *xunetoi*, 8.68.3-4. Constancy in perilous situations, 48.4 σφίσι δὲ περιοπτέον εἶναι τοῦτο μάλιστα, ὅπως μὴ στασιάσωσιν “whereas their one care should be to avoid disunion. Dependable, 68.3 φερεγγυώτατος ἔφαντ “he was considered very dependable”

<sup>642</sup> Westlake (1956) 102 – “not a man of very high ability”, “showed lack of initiative and imagination”, “lacked diplomatic finesse”, “inability to hold his own”. – (1968) 290 “exhibited defects of leadership”, 294 “The narrative of Thucydides does not contain any direct criticism of Astyochus … but it does predispose readers to conclude that he possessed neither the intellectual talents nor the strength of character demanded…” see Beloch 390, as negligible, Meyer (1956) 306, as ineffective, Falkner (1999) 206, “unfairly stereotyped”, in the Ionian affairs “he performed well.”

another is crucial to the success of the trick which requires anticipating your opponent's move. Phrynicus was very sure about Astyochus' position.

Scholars have differing views on the motivations of Astyochus. Was he in the service of Tissaphernes? Was he a traitor? Was he loyal, acting in the service of his country? Astyochus can sway one way or another, acting in accordance with a balance of interests. The actions of Astyochus in a prior episode give us an indication of what his motivations might be.

κάκενος λαβών τάς τε τῶν Κορινθίων πέντε καὶ  
ἔκτην Μεγαρίδα καὶ μίαν Ἐρμιονίδα καὶ ἄς αὐτὸς  
Λακωνικάς ἔχων ἥλθεν, ἔπλει ἐπὶ τῆς Μιλήτου πρὸς  
τὴν ναυαρχίαν, πολλὰ ἀπειλήσας τοῖς Χίοις ἢ μὴν  
μὴ ἐπιβοηθήσειν, ἢν τι δέωνται.

Astyochus took five Corinthian and one Megarian vessel, with another from Hermione, and the ships which had come with him from Laconia, and set sail for Miletus to assume his command as admiral; after telling the Chians with many threats that he would certainly not come and help them if they should be in need. (8.33)

He then makes good his threat and refuses aid to Chios, Sparta's greatest ally in Ionia.

ἐξ μέντοι τὴν Μίλητον ἔπειπον κελεύοντες σφίσι  
τὸν Ἀστύοχον βοηθεῖν: ὡς δ' **οὐκ ἐσήκουεν**,  
ἔπιστέλλει περὶ αὐτοῦ ἐς τὴν Λακεδαίμονα ὁ  
Πεδάριτος ὡς ἀδικοῦντος. καὶ τὰ μὲν ἐν τῇ Χίῳ ἐς  
τοῦτο καθειστήκει τοῖς Αθηναίοις

They sent however to Miletus and requested the aid of Astyochus, but he refused. [he did not yield] Whereupon Pedaritus sent a dispatch to Sparta, complaining of his misconduct. So favourable to the Athenians was the course of affairs in Chios. (8.38)

Thucydides writes that his actions were to the detriment of Sparta. His personal considerations seem to have outweighed those of his state. In another episode, he is dutiful and at the same time mindful of his own

interests. Astyochus thought everything should give way to the importance of convoying so large a reinforcement, which would secure to the Spartans greater command of the sea.

ἐν τούτῳ δὲ ἐκ τῆς Καύνου παραγίγνεται ἀγγελία ὅτι αἱ ἑπτὰ καὶ εἴκοσι νῆες καὶ οἱ τῶν Λακεδαιμονίων ξύμβουλοι πάρεισιν: καὶ νομίσας πάντα ύστερα εἶναι τάλλα πρὸς τὸ ναῦς τε, ὅπως θαλασσοκρατοῖεν μᾶλλον, τοσαύτας ξυμπαρακούσαι, καὶ τοὺς Λακεδαιμονίους, οἱ ἥκον κατάσκοποι αὐτοῦ, ἀσφαλῶς περαιωθῆναι, εὐθὺς ἀφεῖς τὸ ἐς τὴν Χίον ἔπλει ἐς τὴν Καῦνον.

But in the meantime he received a message from Caunus, informing him that the twenty-seven ships and his Lacedaemonian advisers had arrived. He thought that everything should give way to the importance of convoying so large a reinforcement which would secure to the Lacedaemonians greater command of the sea, and that he must first of all provide for the safe passage of the commissioners who were to report on his conduct. So he at once gave up his intended expedition to Chios and sailed for Caunus. (8.41)

Here he indicates that his foremost interest is in the public interest, his sense of duty to the Spartan state. Yet he still had a private, personal concern, for with the fleet were “the Spartans who had come to inquire about him”. These had the power to deprive him of his command. This convergence is in itself quite common and is built into procedures for accountability. The problems begin when the private outweighs the public. The sharper sense of when this balance becomes precarious or problematic is evidenced in his revealed preferences in the act of relaying Phrynicus’ first secret letter to Alcibiades. The first act itself, in Phrynicus’ thinking, commits Astyochus to this action should he receive information relevant to Alcibiades, not anything else.

It becomes clear from the simple mechanics of how anticipation and tricks work that there is only first order thinking involved. On the part of Thucydides himself, we could assume he had access only to the report of

the letters. With which he could assume Alcibiades' denunciations and Phrynicus' subsequent orders for fortification. We could nonetheless assume Thucydides knew of the whole from direct contact with Alcibiades. With this reading, Phrynicus is still required to anticipate whether or not Alcibiades or Astyochus could second guess him. And if so, whether or not they would believe him to be as trusting as he presents himself. This requires second order knowledge which has been shown to be very uncommon when humans plan action, since no form of prediction could be possible other than a random move.

### Bounded Rationality

“The Problem of Theory”<sup>643</sup>: Theory is a controversial topic in the study of ancient history. An attempt to establish the legitimacy of a theory, such as economic theory – a social science – is interpreted as an attempt to force upon the humanities a discipline that “promises a great deal” as Morley rightly notes.<sup>644</sup> He goes on to add that “it is a common criticism of the application of modern economic theory to ancient history that it simply assumes the existence of a form of behaviour ('economic rationality') found only occasionally in the modern West – and, apparently, found mainly among economists rather than the population as a whole.”<sup>645</sup> Game theory research has sought to rectify this. Relaxing the strict assumptions of an economic agent's rationality, it introduced the world to the study of irrationality, or Bounded Rationality. This discipline “depends on the assumption that there is something immutable about human nature”, which is a statement Momigliano employs to describe Thucydides' historical method.<sup>646</sup> The following analysis focuses on the effect of anger on democratic decision-making under the pressure of war, best exemplified by the Mytilenian debate.

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<sup>643</sup> The subtitle of Morley's “Chapter 1, Approaches: The Problem of Theory”.

<sup>644</sup> Morley (2004) 1.

<sup>645</sup> Ibid. 20; 33-50 for a literature review; notably Finley (1973) 20-26, 132.

<sup>646</sup> Momigliano (1990) 41.

## Anger and Restraint

During my residency at the British School at Athens in July 2011, the protests against government austerity raged in Greece's capital. Walking around in the city centre one day, I was faced with the poster:

θέλει “τρόπο”  
ή όργη  
στο Δρόμο  
ΜΕ ΑΓΩΝΕΣ

*It says “Anger wants “its way” on the road to conflict”.*

## The Mytilene Episode (3.1-3.50)

Anger (*orge*) in antiquity is frequently closely associated with madness expressed in poetry, theater, history and politics.<sup>647</sup> Harris says that the historians “established a sharp dichotomy between sensible decision-making and giving way to *orge*”.<sup>648</sup> To some extent Attic orators reflect the views of the citizens, such that Antiphon asks the jury to take its decision without anger and prejudice (*orge* and *diabole*).<sup>649</sup> Similarly, Demosthenes

<sup>647</sup> General literature: Harris (2002); Braund and Most (2003); in Konstan (2007) modern and ancient anger is a catalyst or excuse for violence, in specific Thucydides and Polybius “ascribe genocidal violence to anger” 184; Harris (2002) 20ff for emotion and cognition in the ancient Greeks. I enclose the verb theorized in quotes, unlike Harris, because his phrase “to theorize on anger-restraint” may imply that ancients in a modern sense formally set down the rules that governed anger-restraint. This is not the case.

<sup>648</sup> Harris (2003) 125; for an introduction to the economic theory and the experimental evidence that model these “visceral influences … of rage, fear or lust” see Frederick, Lowenstein and O'Donoghue (2002) 372-373.

<sup>649</sup> On the *Murder of Herodes*, see Diodotus at 3.42; For Aristotle. arousing the emotions of prejudice (*diabole*), compassion (*eleos*) and anger (*orge*) is considered to be an intentional distraction; calling attention to matters outside the subject of forensic and of dikastic speeches (Aristotle *Rhet.* 1354a). It is not allowed in court to speak outside the subject (Lysias 3.44-46). Aristotle states that it is necessary to “forbid speaking outside the subject … For it is wrong to warp the dicast's feelings, to arouse him to anger, jealousy, or compassion, which would be like making the rule crooked which one intended to use.” (*Rhet.* 1454a). Plato makes reference to how one can “arouse and soothe large companies to anger” and to prejudice (*Phaedrus* 267c, similarly *Rhet.* 1415b and 1454a), Demosthenes 37.47 also comments on how the anger of the judges can be tricked by a speaker. For the textual references and translations of Plato, Lysias, Demosthenes and Aristotle, I am

criticizes Athenian citizens who come to speak before the jury empanelled in public service and who with their speech fuel the jurors' anger in order to benefit themselves.<sup>650</sup> There are numerous examples that demonstrate how large groups of citizens can be manipulated by persons that take advantage of and exacerbate shared feeling of anger.<sup>651</sup> In ancient Athens, just as on the streets of contemporary Greece, speakers and slogans evoke anger in order to garner support.

But what does this have to do with Thucydides? Has he anything new to say about this psychological alteration called *orge*? How is *orge* experienced? How does it express itself? Thucydides devised a most ingenious method by which to identify the sources of anger and the effect that anger has on decision-making. Thucydides describes how once the anger subsides, the subjects are faced with a specific decision problem as a consequence of the subsequent relapse of their minds into normality. In the narrative of the revolt of Mytilene (3.1-3.50), a powerful and respected ally of Athens, Thucydides systematically explores anger-restraint and change within an intricate conceptual framework.<sup>652</sup>

There has been sustained scholarly interest in Thucydides' portrayal of the Mytilenian revolt of 428 BC against Athenian hegemony, whilst there has been relatively little consideration of the reason why Thucydides provides such a long excursus on this episode. Scholarly discussions frequently address the role of the Mytilenian debate within the context of the larger narrative from a thematic point of view.<sup>653</sup> The Mytilenian episode is seen as a bridge between the narratives of the plague at Athens and that of the *stasis* at Corcyra.<sup>654</sup> The debate at Athens is also a prime example of

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indebted to Chris Carey's seminar "Playing dirty – *diabole* revisited" presented at the Institute of Classical Studies: Seminar Series 2007-2008; also see Allen (2003) for a discussion on *orge* as an acceptable argument in court following Antiphon and Aristotle.

<sup>650</sup> Demosthenes 18.278

<sup>651</sup> Aristotle *Rhet*.1.1354a

<sup>652</sup> Theme of anger recurs in these speeches: 3.43.5, 44.4,45.4

<sup>653</sup> Wasserman (1956) 27-41; Winnington-Ingram (1965) 70-82; Kagan (1975) 71-93; Hunter (1986) 412-429; Morrison (1994) 525-541; Manuwald (2009) 241-260.

<sup>654</sup> Cogan (1981a) 1-21; Barker (2009) 203-263.

Thucydidean artistic rhetoric.<sup>655</sup> De Ste. Croix argues that the episode was an opportunity to explore a key moment of decision.<sup>656</sup> There continues to be uncertainty regarding whether the narrative implies the success or failure of the vote taken by the Athenian citizens in the assembly, the *ekklesia*, and by extracting Thucydides' views we may arrive at a possible conclusion.

The revolt of Mytilene came as a great shock to Athens although she was still able to quell it successfully. Before the revolt, Mytilene had been a privileged ally of Athens in the Athenian League with special dispensation to contribute ships instead of having to pay the tribute.<sup>657</sup> After the suppression of the revolt a meeting of the assembly was held at Athens, at which the Athenians ordered destruction of the whole city with the execution of the entire male population of Mytilene, and the enslavement of the women and children.<sup>658</sup> On the following day, however, they reversed the decree.<sup>659</sup>

What led the Athenians to change their minds? The Athenians were angry (*orge* 36.2) when they took the first vote (*to bouleuma*) and upon reflection (*analogismos*) they had a change of mind (*metanoia* 36.4). They thought the decree to be savage. Kleon and his allies put a lot of effort into preventing the reversal. In point of fact, the decree was reversed by only a small margin of votes. It's legitimate to ask why the vote was close but it's not a mystery.<sup>660</sup> The *metanoia*, the change of mind, is the central component of this more formal examination of the Mytilenian episode.

*Metanoia* is the symptom of a process, which includes a change in preferences. So far we have investigated instances where agents possess

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<sup>655</sup> Bodin (1940) 36-52; Andrewes (1962) 64-85; Arnold (1992) 44-57; Andrews (1994) 26-39, (2000) 45-62; Debnar (2000) 161-178; for the speech of the Mytilenians at Olympia see Macleod (1978) 64-8; for the speech of Teutiaplus see Lateiner (1975) 175ff.

<sup>656</sup> de Ste. Croix (1972) 297, "moments of decision ... occupy a far greater proportion of the space in the History of Thucydides than in any other work from antiquity – and perhaps any other time." The Mytilenians at Olympia and the Mytilenian debate at Athens are two of the "moments of decision" taken from a list compiled by de Ste. Croix's as the key decision making moments in the *History*.

<sup>657</sup> 3.10.5

<sup>658</sup> 3.36.2-5.

<sup>659</sup> 3.37-48

<sup>660</sup> 3.49.

preferences consistent with actions. In some cases however preferences may be defied when subject to a (finite) period of stress, i.e. actors have dynamically inconsistent preferences. A change in taste or preferences is an exogenous change, much like unpredictable natural phenomena (earthquakes, eclipses, plague), Thucydides' understanding of competition is not only as human versus human, but also as human versus an external force like nature or human nature, as in this case, the emotion of anger.<sup>661</sup> A competition need not include another human, but can be an internal competition. The state of mind of the before-self competes with the state of mind of the after-self, and therefore this type of interaction is called a multiselves model.

### **Multiselves model**

In the multiselves model the two players in standard games theory are seen as one and the same person with two selves, i.e. one person who has unique preferences in different periods.<sup>662</sup> Multiselves means that under unique circumstances, a single player's preferences change as his circumstances change, and in this regard the individual Athenians in the Mytilinean debate can be analysed through the lens of the multiselves model.

The multiselves model is useful in that it helps to identify a particular type of contingency that induces a change in preferences. The contingency in the Mytilinean debate is *orge*, defined as "anger" or, more also more generally, as a "convulsed state of mind" that then induces a change in the state of

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<sup>661</sup> Hornblower (2011) 10, When an external force is characterized by chance, such as natural phenomena, it is placed on the same level as some human emotions. For example, Harmodius and Aristogeiton had a "chance of a love affair" and their "daring deed" led consequently to the fall of tyranny in 6th century BC Athens. Also, Thucydides' references to "panic" in the great sea-battle at Syracuse as a chance occurrence. Likewise, we will see that the chance occurrence of "anger" brought about the "savage" and "irrational decision" by the assembly at Athens.

<sup>662</sup> Spiegler (2011), a recent similar treatment is the multiselves model found in Spiegler who models a consumer with idiosyncratic tastes that change over time.

mind of a population.<sup>663</sup> In the case of the first vote, *orge* clearly refers to anger, yet it can be generalized to include fear, hope, greed, and the rest of the emotions that Diodotus enumerates as *orgai* (3.45-46). We have yet to explain how to determine why the vote was a draw. The more formal aspects of the multiselves model shall allow us to capture the mechanics of the process of persuasion, which determined the outcome. The speeches are therefore our next point of discussion.

### The Speeches

The speeches are indicative of the type of voter for which the politicians compete. Each proposal reveals a unique intertemporal preference relation.<sup>664</sup> Intertemporal choices are “decisions involving tradeoffs among costs and benefits occurring at different times”.<sup>665</sup> Cleon argues that commitment to a first period choice is best, given past experience. The decree must be seen as a commitment device, standing in for the rule of law,<sup>666</sup> and staying the temptation induced by compassion, love of speeches and fairness (*oiktos, hedone logwn, epieikeia*, 3.40.2). Diodotus argues that the assembly should realize that their mistake was caused by the surprise of a possible full-blown outbreak of revolts in the Aegean as a consequence of the parading Peloponnesian fleet. Further that as a result of their surprise, their decision was a mistake and should be canceled. I outline the arguments used to describe the intertemporal preference relations revealed by the proposals of both the speakers. The arguments were as follows:

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<sup>663</sup> Harris (2003) 126, “It was also recognized that *orge* was a common source of crime (Dem. 54.25), and that the testator under the influence of *orge* may have acted against his real wishes (and hence that his will should be set aside), Isaeus 1.13 – *orge*, through which we all make mistakes (cf. 10,18).”

<sup>664</sup> Macleod (1983) 55, on the present-future theme in the Melian dialogue and here.

<sup>665</sup> Ashraf, Camerer, Lowenstein (2005) 131-133.

<sup>666</sup> Cleon seems to insist that the decree performs a function which in forensic rhetoric is fulfilled by the concept of law. Hansen (1991) 205, for the possibility that this is the first evidence of the *graphe paranomon*, 3.43.4-5, which can be dated with certainty in 415BC Andoc.1.17, 22. CT 2. 479, the Mytilenian secession led to Athens' first and only reversal of a decree in the assembly, only matched by the *ekklesia*'s voting away of democracy in 411 BC.

## Cleon's Speech

Arguments:

- a. "I persist against reversing your first decision (*metagnonai* 3.40, also *metameleia* 3.37)", arguing **against the change of mind** (**metanoia** 3.36) of the assembly on the following day. You are not "being advised by our real belief (*paradoxa* 3.37) ... I adhere to my former belief".<sup>667</sup> Cleon argues that the Athenians should commit to their first period decision (*doxa* 3.36) that the Mytilenians are guilty.
- b. Cleon argues that "the edge of your anger is blunted (*orge*, 3.38)" and that the assembly must "not forget [their] suffering and yield to present weakness (3.40)". They should not give in to temptation.
- c. Cleon is bent on persuading his audience to commit to their first-period choice and argues that "bad laws that are never changed are better than good laws that have no authority (3.37)".<sup>668</sup>

Formally **Cleon's intertemporal preference relation** would look like this:  
 $\{\text{convict}\} > \{\text{convict, acquit}\} > \{\text{acquit}\}$ <sup>669</sup> where the cost to the institution of the rule of law is so great as to restrain the assembly from deviating from its first period choice.

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<sup>667</sup> *Doxa* is decision, opinion, belief; see Debnar (2000) 164, for *paradoxon* in this passage.

<sup>668</sup> Macleod (1983) 108, Cleon's contention of law is used in a normative sense, as part of the debate between *nomos* versus *physis*; Immerwahr (1973) 28, Cleon's "blind reliance on *nomos*". He "adopts this position merely for the convenience of the moment, for he wants to shut off further discussion of the decision regarding the fate of Mytilene".

<sup>669</sup> How to read the I.P.R.:  $a > (a,b) > b$ . For period 1 preferences, evaluate the two elements at both ends of the expression by the first inequality sign,  $a > b$ . For period 2 preferences, evaluate the two elements in the centre,  $(a,b)$ , by the second inequality sign, therefore  $a > b$ .

## Diodotus' Speech

Arguments:

- a. In period 1, the assembly's anger is coupled with haste, and they ask that the decree be executed "as quickly as possible (*kata tachos*)". In Diodotus' view- "nothing is so contrary to good counsel as these two, haste and anger (*tachos* and *orge*), whereof the former is ever accompanied with madness (*anoia*) and the latter is uneducated (*apaideusai*)<sup>670</sup> and narrowness of mind" (3.47).<sup>671</sup>
- b. The assembly on the following day, upon reflection (*analogismos*), changes its mind. In Diodotus' view- "in the anger of the moment (*pros orgen tuchete* 3.43)" you punish those for mistakes that you yourself commit. The only way to prevent this is when "words are the instructors<sup>672</sup> of action ... and shed light on the hidden future (*me emphanes* 3.42)", i.e. deliberation takes time, but is a "clarifying advantage (*phaneros* 3.43)"
- c. Diodotus calls on them to consider not the benefits of the present but of the future, to reject the decree as a commitment device and consider the benefits of the reversal for future policy (*ou dikazometha ... dakaios, alla bouleuometha ... chresimos*, 3.44).

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<sup>670</sup> compare 3.84.

<sup>671</sup> 3.36.2,4; 38.1; 42.1; 43.5; 44.4; 45.4,6 are all the instances where *tachos/tuche* and *orge* are associated; Harris (2003) 122, "orge and *eros* were both conditions of the inner person which led easily to action".

<sup>672</sup> Words or arguments are *didaskalos* and at 3.82 war is *didaskalos*. Respectively, they represent the process of deliberation and the greatest movement (change), and they are both personified teachers.

Formally **Diodotus' intertemporal preference relation** would look like this.  $\{convict\} > \{convict, acquit\} \sim \{acquit\}$ ,<sup>673</sup> where the assembly's temptation to acquit the Mytilenians is overwhelming.

### Anger and Naivete

Both Cleon and Diodotus have opposite alternatives yet they agree on one fundamental principle. They agree that the first period action was taken by an assembly, which was characterized by a decision made in an unschooled, uneducated state of mind.

"There is a deep anti-intellectualism in Cleon's address"<sup>674</sup> and he implies that the first period's decision was uneducated (*amathia, amathesteroi*) is better than a wise decision (*sophron, xunetos*) given law as a commitment device. Conversely, Diodotus argues that an uneducated decision (*apaideusai*) is worse than the future benefit of a wise decision (*eubouilia, sophron*). The assembly's first period decision was a mistake because there is no commitment device, no law that can restrain humanity's savage nature. One speaker states the rules, while the other speaker educates the assembly to comprehend the novel predicament in which they find themselves.

### The first as the worst

The Athenians did not at first believe that Mytilene was planning to revolt (3.3.1). The revolt was a shock both because it was unexpected and because it was the first (3.40.5). In addition, the Spartans risked a fleet in Ionian waters to aid Mytilene and passed below Athens' radar (3.29.1; 3.35.1). This fleet is what fueled their anger the most (3.36.2). One of Thucydides' causal variables for bad-decision-making is surprise of the first, whether it be the first encounter (e.g. the first invasion of Attica) or first

<sup>673</sup> How to read the I.P.R.:  $a > (a,b) \sim b$ . For period 1 preferences, evaluate the two elements at both ends of the expression by the first inequality sign,  $a > b$ . For period 2 preferences, evaluate the two elements in the center,  $(a,b)$ , by the second inequality sign, therefore  $a \sim b$ . You are indifferent between choosing  $a$  or  $b$ , because  $b$  is tempting you.

<sup>674</sup> Mynott (2013) 183ft.4.

event (e.g. the first ally to revolt). Mytilene was the first wartime rift between Athens and her subject-allies. New occurrences (*kainos*) seem greater than they are.<sup>675</sup> The theme of surprise is later reduced into a two-word expression, *ekplexis megiste*. This is Thucydides' "favorite expression for the 'magnitude' of a 'shock'", says Hornblower.<sup>676</sup> The Athenians as a result of the surprise of the first event of its kind suffered from what I refer to as magnification. The shock fueled their anger to accept the proposal of a punishment that was disproportionate to the offense. The Athenians accepted that the initial decree was savage. The decree is ὥμον... καὶ μέγα *crudelis* and excessive, and ὥμος is a term used to describe how the decree was perceived on the following day.<sup>677</sup> The assembly's subsequent vote would have to decide whether to execute this savage sentence or not.

The theme of "surprise" and of "firsts" as key turning-points is developed from bk 1 to bk 8. In the first invasion of Attica, Pericles takes precautions against such an event (2.22).

But he, seeing that they were in a present state of anger [*pros to paron chalepainaontas*]<sup>678</sup> and inclined to evil counsels, and confident that he was right in refusing to go out, would not summon an assembly [*ekklesia*] or military meeting [*syllogos*], lest, coming together more in anger than in judgment [*orge ti mallon he gnome*], they make a mistake [*examartein*]. It was in this way that he protected the city, and made it possible to keep peace [*di' hesuchias malista*].

With responses,<sup>679</sup> Pericles expects them to be in *orge* since he knows its causes, i.e. they had been stunned by calamities [*kakopragiai* *ekpeplegmenoij*]. In bk 7, *ekplexis* is used in the narrative of the sea-battle in

<sup>675</sup> Note 3.82.3, *hyperbole* and *kainos* are used together of people reacting to actions of others; Taleb (2012) 46, calls this "mental defect, *the Lucretius problem*, after the Latin poetic philosopher who wrote that the fool believes that the tallest mountain in the world will be equal to the tallest one he has observed."

<sup>676</sup> Hornblower (2011) 9; 8.1.1-2, 8.96.1.

<sup>677</sup> Betant (1961) 519.; Cf. 3.82 on the Corcyrean stasis as first and perceived as the worst: "such was the character [*orgais*] they displayed toward one another, first [*protais*] before all the Greeks".

<sup>678</sup> *Chalepainaon* also found at 3.82.5.

<sup>679</sup> 2.59, 2.60

the Great harbour of Syracuse to describe the shock of defeat: “the greatest shock of all” (*ton xumpason elasson ekplexis*), that reduced the army to “one same impulse” (*apo mias ormes*).<sup>680</sup> The ironic twist then is thrown at the reader who is told that the Athenian army would only be saved by an exogenous intervention; “unless there was some incalculable element” (*en me ti para logon gignetai*). This reminds us of Mytilene’s incalculable element, “the wind that by chance” sped the second ship to stop the execution of the first decree (3.49.3-4). Had the ship been late, all the deliberation of the assembly would have been for naught. In situations like these, corrections it appears succeed by chance.

*Ekplexis* is the feeling of surprise, which in the case of surprise attacks we can guard against. It is also the advantage of military surprise that one can use to your advantage as Teutiaplus advised. Its causes are introduced by Pericles, and extensively explored in the Mytilene episode, and it is presented as a matured tactic employed by Archidamos in the first invasion of Attica and variously adopted by Demosthenes at Pylos and during the Sicilian Expedition. Hunter on the events of Mytilene concludes, “The unexpected or unaccustomed, after producing deep emotional upsets, can lead to a change of mind, to repentance. In other words, we are dealing not with isolated generalizations but with a configuration.”<sup>681</sup> Thucydides produces a replicable decision making environment packed tightly within historical facts and varied comments of interest.

#### ***Rational choice theory, Incentives and the Mytilenian debate***

In the remainder of the thesis, I take these conclusions on process and decision-making and extrapolate the dynamics of this historical situation, addressing the differing arguments. First, there is a preamble to Mara’s work on preferences in this debate and Ober’s conclusions on strategic

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<sup>680</sup> 7.71.6-7

<sup>681</sup> Hunter (1986) 115, explores the mass psychology of fear as the emotion bridging surprise to a particular state of mind; she focuses on how fear causes irrational behavior. The treatment of surprise and fear in Thucydides is similar to Gorgias’ *Economium to Helen*, where surprise leads to *eros*. My research focuses on how surprise leads to *orge*.

behaviour in the assembly, which will lead us to a high level of generality that applies to this and any other intertemporal debate. This is an experiment to extract a general game from the conceptual framework provided by Thucydides.

The assembly in the first period, acting as a naive population on account of surprise and anger, returns to a state of high sophistication and principles on commitment in the second period. The assembly therefore faces the choice of either choosing the immediately beneficial alternative, commitment to the decree, or the further future benefit, of adapting the system to suit expediency in policy. Foresight we shall see was not enough for the voter to determine which intertemporal preference relation was better: Diodotus' temptation menu,  $\{\text{convict}\} > \{\text{convict, acquit}\} \sim \{\text{acquit}\}$ , or Cleon's commitment menu  $\{\text{convict}\} > \{\text{convict, acquit}\} > \{\text{acquit}\}$ .

Mara describes Thucydides as a social theorist.<sup>682</sup> Political theory and political science are concerned with the relationship between politics and rationality. Political phenomena are determined by the choices and actions of rational individuals. This method is unreliable, he says, as it ignores "non-rational needs or emotions", culture and the question of power. In microeconomics, even if rational choice theory accounts for players who "act rationally if you do what you believe serves your interest", it does not empower political actors to choose the best action. He identifies that players engaged in political debate are often confronted with a variety of options that satisfy all the necessary conditions of "good" policy. This is the age-old problem of making a choice among multiple equilibria.<sup>683</sup>

In his discussion of the Mytilene episode, Mara calls Diodotus' proposal and Cleon's proposal "competing equilibria"<sup>684</sup> and concludes, "these opposing

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<sup>682</sup> Mara (2009), (2008).

<sup>683</sup> *Ibid.* 31-34.

<sup>684</sup> *Ibid.* 58, He says that the "competing equilibria of interest and justice" are Diodotus' equilibrium of interest and Cleon's equilibrium of justice. Shortly after, he acknowledges that Diodotus' proposal is in fact a radicalization of Cleon's proposal by emphasizing not justice as retaliation (3.38.1-2, 3.39.6, 3.40.4) but justice as the good of the city (3.44.1-3),

contradictory proposals could each be seen as rational". The comparative rationalities, however, cannot be explained by rational choice theory or "on the strategic level alone, for they are driven by different conceptions of Athens' interests and identity". Political rationality is "undercut by the substantive irrationalities [passions and emotions] that can surround strategies". "In treating debates ... as if they were competitive attempts at preference satisfaction, [the debate] offers a substantive account of the content of political practice". "The condition for rationality in politics would seem to be the control [Cleon] or the education [Diodotus] of the passions, yet rationality seems inadequate to the task."<sup>685</sup>

Thucydides' work, as Mara describes, is a "kind of *logos* whose concerns extend beyond strategy".<sup>686</sup> This is why I introduce bounded rationality, since it is a description of rationality which relaxes the strict ordering of preferences, allowing players to undergo changes. Bounded rationality accounts for an individual's cognitive limitations due to information, ability or time constraint. Undeniably, it is more realistic to describe people with preferences that are in constant flux, who possess changing tastes.<sup>687</sup> The complexity of reality is a condition rational choice theory does not satisfy.

Mara identifies political equilibrium generally as coordination and as an equitable exchange relationship.<sup>688</sup> My equilibrium structure is characterized by a coordination problem among voters and an exchange between a voter and a speaker. Mara fails to recognize in his work that incentives play a very important part in the "exchange relationship" between a voter and the speaker in the assembly. Although he does introduce incentives through Cleon who emphasizes that democratic rule is ineffective due to democratic

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or whatever is in the state's interest. He concludes that "interest may take priority, setting the two concerns against each other underscores the distinctive identity of justice. ... While justice is not reducible to interest and while the two may often be opposed, they may, while remaining separate, coalesce." Interest is often a key component of the study of Diodotus' speech.

<sup>685</sup> *Ibid.* 57.

<sup>686</sup> *Ibid.* 61.

<sup>687</sup> *Ibid.* 36, 60.

<sup>688</sup> Stem from economics two fundamental welfare theorems.

speech or rhetoric, the incentives for the Athenian citizens to participate and perform in decision-making are for the most part overlooked.<sup>689</sup>

Ober outlines the method devised by the Athenian *polis* to create incentives and deter individuals from free riding. An average Athenian citizen, according to Thucydides, was fully aware that his personal opportunity for success was a direct result of his state's success. Deliberative rhetoric was a unique way of mutual instruction to ensure the successful performance of the democratic decision making process. Those who did not participate were not considered to be "apolitical" but "useless".<sup>690</sup> Political apathy, unlike today, was not tolerated. "All citizens are expected to participate in making decisions as responsive members of the judging audience of voters. This means that voters are not passive recipients of a public speaker's rhetorical performances; rather they are active judges in their own and the public interest, and fully capable of dismissing incompetents."<sup>691</sup> Judging was the key to success in the maintenance and accumulation of common resources, and, as such, the rule of law was a powerful commitment mechanism.

In 2008 Ober published "Democracy and Knowledge" in which he outlines the precise collective action problem faced by an Athenian assembly. The strategy of Athenian democratic institutions and cultural practices addressed three issues: the dispersed knowledge problem, the unaligned action problem, and the transaction cost problem. The first is concerned with the level of expertise of a voting citizen and how less informed citizens influence a vote. The strategy to solve this problem requires networking. I do not go as far as to discuss networking, however I do address expertise: mainly because Thucydides does not explicitly address networking issues. The second is concerned with coordinating action, which requires that citizens have the "knowledge of what others know, what others know that they

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<sup>689</sup> Mara (2009) 55. Our environment is characterized by conflict and common interest. This is the environment for our model, which will determine the equilibrium strategy of randomization. Heimgart, Huck (2006) and Schelling (1960) 175ff.

<sup>690</sup> 2.40

<sup>691</sup> Ober (2009) 78.

know".<sup>692</sup> Thucydides reveals this reciprocal recognition implicitly in the narrative and in the debate.<sup>693</sup> The third is concerned with minimizing a citizen's expected cost of completing a potentially profitable transaction (i.e. decision), which requires standardizing of rules (e.g. law).

In modern terms, Thucydides in the Mytilene episode shows how the self-conscious incorporation of the democratic institution forces the speakers and voters to question their own model. The speakers make explicit how Athens' decision-making process blinds the voters and speakers to their own "imperfect processing of information", inability to grasp the "complexity of an environment" and how it does not solve their collective problem of the "subjective perceptions of the external world that people hold".<sup>694</sup>

I now leave the literature analysis of this discussion to introduce the formalization of the above arguments into an abstract structure. The initial abstractions will seem tiresome at first but the end product should help us to understand better what exactly transpired in the assembly in 427 BC.

### ***Introduction to the Model***

The model is a two-period decision problem for an assembly with dynamically inconsistent preferences. We must extend the model to account for different types of voters and also the competitive interaction between the speakers. In order to do this we must first analyse the simple interaction between a single speaker and his audience, i.e. a monopolistic environment. Secondly, we allow the voter to vary in his degree of sophistication. Lastly we shall introduce the second speaker and evaluate the effects on the voter, i.e. a competitive environment. These simplifications are necessary at this phase of the analysis. Like a house in construction we will build brick by brick.

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<sup>692</sup> Ober (2008) 107.

<sup>693</sup> Alkidas' actions receive mirror reactions from Paches, and the assembly knows it was angry in the first period and so do the speakers.

<sup>694</sup> North (1990) 111, on how institutions affect rational choice models.

### ***The Athenian assembly is a population of sophisticated voters***

Before we begin building our model we must first identify the elements that Thucydides selects as the rules of the game. Therefore we will restate the elements of the decision problem in more formulaic language. The objective of the model is to help us to understand the implications of the assembly's dynamic inconsistency: that is the extent to which the voters are aware of their predicament. First we will fix the elements of the model, which we will later vary to determine whether the outcomes vary as well.

Assume for now that the Athenian assembly has the ability to anticipate correctly its future preferences, i.e. that all voters in the assembly are sophisticated. Athenians are *a priori* sophisticated decision-makers.<sup>695</sup> Thucydides makes this assumption for us. Athenian character is described by the Corinthians at Sparta before the outbreak of the war: The Athenians have had a wider experience (*polupeiria*), and therefore the administration of their state unlike yours [Sparta's] has been greatly reformed (*kekainotai*). The Athenians are assumed by other players to be sophisticated, i.e. experienced with changing environments. Thus, we can assume, by means of a grand simplification, that Athenians are sophisticated voters.

For Thucydides, sophistication is to anticipate, to know about something *ex ante* and, when exceptional, is the ability to "see" into the distant future.<sup>696</sup> Themistocles, an Athenian general whom Thucydides greatly admires, can see the hidden future (*aphanos*) and is called "the best predictor" (*aristos eikastes*, 1.138). Naiveté, on the other hand, is the opposite of sophistication. Diodotus provides us with a definition for naiveté. Naiveté represents a chance state of mind of men (*xuntuchiai orge ton anthropon*) which being unseen is more dangerous than those states of mind that can

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<sup>695</sup> 1.71.3-4, the Corinthians address the Spartans before the war broke out, our episode takes place four years into the war. This is the context in which I use the expression *a priori*.

<sup>696</sup> Sophistication is not unique to the Athenians. With respect to *orge* and sophistication as linked to sight, clarity, or especially just the ability to see into the future, some examples are: 1.91 *orge* and *phaneran*; 1.32 *orge* and *saphes*; 1.138 *xunetos phainesthai*; 1.21 *epiphanestatwn semeiwn*.

be seen (*onta aphanes kreisso esti ton oromenon deinon*, 3.45).<sup>697</sup> The states of *hope* and *desire* are unseen, while the states of *necessity* and *daring*, *hubris in greed* and *pride* are seen, but chance events can induce an illusion.<sup>698</sup> It is upon this ancient conception of sight and blindness that I base my definitions of sophistication and naiveté.<sup>699</sup>

Thucydides notes barely any information about the different speakers from the first debate. All we know is that in period 1 Cleon's speech won and that Diodotus had opposed it.<sup>700</sup> Nonetheless, it is important to note that the choices available in period 1 are the same choices that are available in period 2. Although Thucydides only records the speeches in period 2, the choice made in period 2 is a choice made from a menu "behaviorally" chosen in period 1. Each speaker formulates an intertemporal preference relation that caters to a naive or to a sophisticated voter. It is important here to note that in period 1 only Cleon's menu was selected. The reason for the inclusion of Diodotus' menu in the second period will be introduced toward the end of this chapter when I discuss renegotiation in competitive environments.

The first problem models a sophisticated decision-maker, the Athenian voter, as possessing two selves with idiosyncratic preferences. The two-period problem is characterized by a change in preferences due to the passage of time. A voter's *before* self is said to be in competition with his *after* self. The model of the voter's choices and strategies will reveal a formal rule that predicts how the selves will act.<sup>701</sup> In game theory this rule is called a solution concept.

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<sup>697</sup> 3.45.5. Cornford (1969 [1907]) 123-24 describes Diodotus' description of this aspect of human nature as "a condition of blind intoxication, the eclipse of rational foresight". Note the ubiquitous use of the verb *phaino* in Diodotus' speech, whereas in Cleon's it is virtually absent and instead emphasizes present appearances or sophistic theatricality (*sophiston theatais* 3.38.7).

<sup>698</sup> Cornford *ad loc*; Jowett (1881) 197-198.

<sup>699</sup> The first theorist to identify sophisticated and naive characteristics in the context of modeling was Robert Strotz (1956). The terms were coined by O'Donoghue and Rabin (1999).

<sup>700</sup> 3.36.3; 3.41.

<sup>701</sup> In game theory, player strategies are used to predict future outcomes. A solution concept is the formal rule that predicts how the game will be played. The optimal

In the monopoly and competitive environments proposals are available only in period 1. The second period exists so that voters may vote to choose among the set of alternatives made available in period 1.

### **A feasible set**

The set of proposals Thucydides records is a set of two proposals {Cleon, Diodotus}. These two proposals are part of a larger set of available proposals offered to the voters. This larger set of proposals is called the set of feasible proposals. A feasible proposal should be understood to represent those speeches for which the voters in the assembly would consider voting.<sup>702</sup> Of course who is to say something “said” is or is not feasible? Therefore, we shall let Thucydides provide us with his construction of a feasible set. Thucydides says that the two speeches in period 2 represented “the proposals on either side (*pros allelas*) which were most equally matched (*antipalon*)”. These were the opposing speeches most equally matched in persuasive power. They define the limits for the set of feasible proposals; for example, think of the proposals that steered a middle course between these two proposals. There are none, they could either acquit or convict. Persuasive power defines the set. The set of feasible proposals, as a result, is a subset of a grand set of proposals heard in the assembly, i.e. the set A of “most equally matched” menus is a subset of the set A of feasible menus, such that both are subsets of the set Z of all available menus in the market.

### **First period preferences**

In the first period no speeches are recorded and we are only told “a discussion was held” (*gnomas epoiounto*). Thucydides gives a synopsis of

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predictions are what game theorists call solutions. The description of the strategies that the selves will adopt over the two-periods is expressed as a result of some game theoretic solution concept.

<sup>702</sup> Later we formally define a feasible proposal through constraints on the assembly’s choices. A feasible proposal is a proposal that voters accept.

the arguments, most likely the ones promoted by Cleon. The points of the unrecorded speeches are: 1) the revolt was inexcusable, Mytilene was not a subject state like the others, but free; 2) the presence of the Peloponnesian fleet was proof that the revolt was a long premeditated affair.<sup>703</sup> The outcome of the arguments was to 1) execute the Spartan Salaethus, despite his promise to help end the Peloponnesian siege of Plataea; 2) execute the Mytilenian conspirators captive at Athens; and 3) execute all the male population of Mytilene and then enslave the women and children. Salaethus and the captives were found guilty as charged and were in fact executed. The question of the guilt of the general Mytilenian population is the reason that a second debate was held. We are not told whether the Mytilenian population supported the revolt, or not. The assembly's decision to convict the entire Mytilenian population in period 1 is the decision under investigation. This is all we know of period 1 preferences: {convict} > {acquit}.<sup>704</sup>

### Second period preferences

In period 2 the assembly chooses an element {acquit, convict} from a chosen menu *A*.<sup>705</sup> In period 1 Cleon's commitment menu is selected, but in period 2 another menu is made available: Diodotus' temptation menu. Cleon's commitment menu for the sophisticated voter, who is committed to his first period choice, constrains the voter to prefer {convict} > {acquit}.

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<sup>703</sup> The second point is corroborated by Cleon in his speeches referring to the *ekklesia* when it is considering forgiving traitors he says "do not betray yourselves" 3.40.7.

<sup>704</sup> I follow the Condorcet theorem [1785] in as much as a group of individuals have common preferences. Ober (2008) 109, "Condorcet's jury theorem is limited to binary judgments made by voters who are marginally likely to be right in their choices ... for binary questions of guilty or not guilty and there is a presumption that jurors are sincerely trying to find the right answer to the question." It is evident that the "Condorcet theorem is incapable of explaining the decision-making processes of the Athenian Assembly, where a very large body of persons, some of them expert in various domains relevant to the issue of the day, often decided among a variety of possible policy options after listening to a series of speeches."

<sup>705</sup> Essentially we have the same player choose twice from the same set of actions {acquit, convict}. Where the first period is fixed, convict, because of period 1 state of mind, in the second period he may or may not follow his first period preference. When I say commitment menu, I really mean preference for commitment, or a preference for smaller menus. Likewise, a temptation menu is a preference for temptation, or a preference for larger menus.

Then, Diodotus' temptation menu is for the naive voter, who is tempted in period two to change from the preference relation  $\{\text{convict}\} > \{\text{acquit}\}$  to  $\{\text{acquit}\} > \{\text{convict}\}$ .<sup>706</sup>

### ***Solution concept: subgame perfect equilibrium***

The standard solution concept for such a two-period game is a subgame perfect equilibrium. Subgame perfection means that the voter is able to anticipate perfectly the future change in his taste.<sup>707</sup>

E.g. Take a person on a diet who goes to a restaurant:<sup>708</sup> Let  $Z = \{\text{lettuce}, \text{steak}\}$  such that first period preferences are  $\{\text{lettuce}\} > \{\text{steak}\}$ , and second period preferences are  $\{\text{steak}\} > \{\text{lettuce}\}$ . In a subgame perfect equilibrium, self 1 will choose menu  $\{\text{lettuce}\}$  in period 1. A practical example of a first period commitment is when a person reserves a table at a vegetarian restaurant. Consequently, self 2 will be forced to eat lettuce in period 2. In equilibrium, self 1 strictly prefers lettuce to any other menu (in particular to the grand set  $Z$ ). This model generates a taste for commitment which people display in situations involving temptation. The ability to take a decision with perfect foresight in the present is a subgame perfect solution.<sup>709</sup>

### ***Assumptions***

The following exposition is meant to reveal Thucydides' theory on inconsistent decision-making. Therefore, we will first make assumptions that

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<sup>706</sup> Gul-Pesendorfer Model (2001); Eliaz, Speigler (2006); Spiegler (2006); Spiegler (2011) 205ff. and Appendix A in general.

<sup>707</sup> Relaxing the perfect foresight assumption is central later when second period ties are broken in favor of the speaker that interacts with the assembly.

<sup>708</sup> E.g. (Temptation) I am on a diet. I prefer to eat salad to pizza. But when I am at a restaurant and I am presented with the choice of salad or pizza, overwhelmed with temptation, I choose pizza over salad. Therefore, before the restaurant I prefer salad to pizza, when at the restaurant I prefer pizza to salad. This holds if I could commit to a decision *ex ante* of preferring salad over pizza. In this case location induces the change in preference. This multiselves model explores how one individual is in competition with his before self and his at restaurant self; Behavioral biases literature review: Huck, Zhou (2011).

<sup>709</sup> Spiegler (2011) 13.

may appear irrelevant to the discussion on Thucydides, but are necessary to understand the precise situation narrated.<sup>710</sup> We shall begin to build our model by looking at the fundamental interaction between a single speaker and a voter, called a monopoly environment. For the present discussion a proposal selected in period 1 determines the choice made in period 2. We will later introduce a second menu in period 2 only after we have discussed a voter's behavior in a monopolistic environment and then in a competitive environment building on these scenarios.

I follow Spiegler's presentation of the multiselves model closely. It is best then that I provide a translation of the terms I borrowed from him. I call a consumer a voter. A firm is a speaker. A menu of alternatives, also called a price scheme, is what I call a proposal. Spiegler's alternative, also called an action-payment pair, is a set of actions a consumer can take conditional on having accepted a firm's price scheme in period 1. An action-payment pair is what I call an action-acceptance pair. An action-acceptance pair is a set of actions a voter can take conditional on having accepted a speaker's proposal in period 1. Thus the set of actions is the set {accept, reject} conditional on having chosen {accept} in period 1.

I drop the choices convict and acquit because our focus from now on is no longer centred on the specific outcome of the Mytilenian debate. I thus generalize these results by modeling whether a proposal would be accepted or rejected.

### **Rules of Rhetoric**

The economist, Ran Spiegler develops an axiomatic modeling approach to multi-issue debates. His formulation generalizes even further the assumptions I make here. "What makes debates especially hard to model is

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<sup>710</sup> Sen (1982) 432-449, argues that truth or fact is a necessary but not a sufficient condition for a description to be good, which allows departures from truth like approximations, metaphors, and simplifications when the objective of the description may be helped by these departures from truth. Assumptions are not judged by their accuracy but by their predictive usefulness.

their relative lack of explicit structure, compared to mechanisms such as voting or even bargaining. The “laws of rhetoric”, which determine the legitimacy and strength of arguments are seldom clear-cut.<sup>711</sup> In the ancient Greek context, Athenian deliberative rhetoric was relatively clear-cut. The “rules of rhetoric” were an intrinsic part of the education of any Athenian rhetorician, and a discipline to which an Athenian citizen attending an assembly meeting would have been regularly exposed. Unlike modern common or civil law countries, the validity of evidence in court in ancient Athens was based on the quality of your speech rather than the quality of your witnesses and the like.<sup>712</sup> Speeches were shown to hold by a process of cross examination. Todd on the evidence of witnesses as supporters rather than as impartial observers writes, “In the work of the historians Herodotus and Thucydides, *martus* and its cognates are used in a consistent and striking way: they are regularly found with the meaning ‘somebody (or something) which supports my argument at this point’ (e.g. Hdt. 2.18.1; Thuc. 1.8.1); but the term is not used to describe ‘sources of information’ in a neutral context. For this purpose Herodotus uses *akoe*, ‘word of mouth’ [hearsay], ‘oral tradition’; and when Thucydides discusses his methods of research, he speaks of cross-examining *ton allon*, ‘other people’ (1.22.2).” The method by which evidence of truth is uncovered in arguments is by using the rules of rhetoric, cross-examination and *doxa* excluding hearsay, *akoe*. *Doxa* are commonly held beliefs,<sup>713</sup> whereas *akoe* are unfounded rumors.<sup>714</sup>

### **The Decision Rule**

Each voter's preferences are limited by Athenian democratic culture. Each is an “active judge in their own and the public interest, and fully capable of

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<sup>711</sup> Spiegler (2011).

<sup>712</sup> Todd (1990) 23.

<sup>713</sup> Spiegler's “world views” (2006).

<sup>714</sup> See Thuc's treatment of *akoe* in book 6 in the Peisistratid excursus “I assert more accurately, than others by hearsay, and this may be known to anyone in the following way.” His evidence, here for the distant past, is based on stone inscriptions and deductive logic, CT 3.446; 6.55.1, also see 6.53.3. “In analysing contemporary history, Th. relied more on oral accounts”, says Hornblower, 447.

dismissing incompetents", as Ober rightly observed.<sup>715</sup> In the methodological section in Book 1, Thucydides writes "the discovery of the facts was laborious, because those who were eye-witnesses of the several events did not give the same reports about the same things, but reports partial to one side or another, or according to their memory."<sup>716</sup> Each voter follows his own idiosyncratic decision rule, just like Thucydides himself must do. The decision rule is a rule that determines the proposal  $x$  a voter will choose.<sup>717</sup> A speaker's proposal is represented as a function of his arguments. The decision rule function is quasi-linear,<sup>718</sup>  $P(a,b) = a - g(b)$ ,  $a$  are similar beliefs and  $b$  are persuasive arguments.<sup>719</sup> The variable "a" is the number of arguments in a proposal that are similar to the beliefs of the voter. We assume that the more similar the proposal of the speaker is to the beliefs of the voter, the more utility the voter derives from accepting the proposal. The function  $g(b)$  is the number of persuasive arguments in a proposal, or arguments that contradict a voter's beliefs. Persuasive arguments are defined here as a "bad", or arguments in the proposal that the voter does not like. The function  $P(a,b)$  specifies a tradeoff between

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<sup>715</sup> North (1990) 109, for a review of this field of modeling institutional constraints versus constituent-legislator incentives.

<sup>716</sup> 1.22.3.

<sup>717</sup> I follow Ober: "If a group is to make good policy it will need *methods of judgment* capable of getting *facts about the world right*. [my italics] Yet, because it is concerned with an inherently uncertain future, policy making requires much more than accuracy in regard to objective facts about the world - it requires, for example, agenda setting to determine the relevant question [binary question: reverse, not reverse], the range of culturally acceptable solutions [binary question], the relevant set of facts to be brought to bear [what both speakers and the assembly know in common], and how much weight ought to be given to each [the decision rule].", Ober (2008) 110 is describing what public choice literature calls rational voter ignorance, North (1990) 109; Spiegler (2006). There is scant research on deliberation over collective decisions in the format of a debate involving the collective choice procedure of rhetoric. The only other papers on this topic are Spiegler (2006), Glazer and Rubinstein (2000) and Aragones et al. (2001), for a review Lipman (2002).

<sup>718</sup> A quasilinear function is a function that is linear in one argument and may or may not be linear in another argument. See Ober (2008) 114ff. for the alignment solution to the dispersed knowledge problem. Ober gives the examples of a preference algorithm (non-cognitive, like the movements of a school of fish) and a rational agreement (rule that everyone in the US drive on the right side of the road). The latter requires common knowledge of some rule and that everyone follows the rule.

<sup>719</sup> Spiegler (2006) 387-8, my  $a$  is Positive Argumentation: "desirable attributes of world views that are consistent with [a speaker's] position in a debate" and my  $g(b)$  is Negative Argumentation: "desirable attributes of world views that are inconsistent with [a speaker's] position in a debate", Spiegler cites Glazer and Rubinstein's (2001) game theoretic approach as a precedent "to the admissibility of arguments and a rule that determines their persuasiveness".

what the voter likes and does not like in a proposal.<sup>720</sup> In the historian's case, matching evidence is positive, while conflicting evidence is negative, i.e. effort is a cost ( $\pi\acute{o}\nu\sigma\zeta$ ). This function mathematically defines the calculation which each voter must solve. Diodotus explicitly criticizes the fact that he must tailor his proposal because his audience is actively calculating.<sup>721</sup>

A simple example may help to illustrate what I propose. I like pepperoni and dislike anchovies. But there exists some amount of pepperoni on a pizza that would compensate for having to eat some amount of anchovies.<sup>722</sup> A quasi-linear function describes this sort of tradeoff, for example, when you are 10 yrs old or when you are 25 yrs old. At 10 no amount of pepperoni can convince you to eat an anchovy, while at 25 you eat anchovies as long as they are outnumbered by pepperoni pieces. In this example  $g(b)$  at 10 is a different function to  $g(b)$  at 25. Like the ages in this example, a rhetorical proposal might call for different structures of argumentation. We shall see that an optimum is at the point at which a speaker uses no more than the absolute necessary number of persuasive arguments in order to convince

<sup>720</sup> My decision rule, for Spiegler (2006) 387, is an argumentation rule which is a function  $D$  that assigns admissible arguments for each party in a debate. My  $x^*$  is his persuasion rule  $r$  that assigns a winning party to every debate. Spiegler makes a distinction between a parallel session and a plenary session where two distinct issues are debated. The two parties hold opposite views and can decide on each issue separately or jointly, respectively, 389. The persuasion rule is an  $r$  that is a debate function  $r(d)$ . I define persuasive arguments and same beliefs as elements contained in the set of feasible (available) arguments of the speaker and the voter (Spiegler does not make this distinction, calling available arguments part of the set of "world views"). This is why we can use our  $x$  to describe the interaction between speakers and the interaction between speakers and voters using the same variable  $x$ . Remember, an ancient Athenian voter is not a passive recipient of the speakers' proposals. However, as is demonstrated by Spiegler (2006), this model should nonetheless hold for any debate environment since "world views" (*doxa*) are a common form of evaluation for any audience, ancient or modern, as long as there is a defined rhetorical strategy.

<sup>721</sup> 3.43.

<sup>722</sup> Varian (2006 [1987]) 41. This utility function also specifies that the voter is risk neutral.  $df(x,y)/dx / df(x,y)/dy = 1/g'(y)$  which implies that the marginal rate of tradeoff between similarities  $x$  and persuasive arguments  $y$  depends only on the persuasive arguments and not on similarities. The amount of similarities does not matter to the choice of persuasive arguments. This means that the choice of rhetorical argumentative strategy does not matter as long as there are similarities in the proposal. Which leads us to the following statement. As long as  $f(x,y)$  is non-negative the voter considers the proposal to be feasible. We do not want to make assumptions on risk in this decision problem as it would invoke a series of extrapolations that I am at present unable to make in my research. It will be shown that the voter prefers a risk free calculation of utility because he considers all calculations of expected utility to be equally valid for any given time horizon in the future.

the voter to vote for him. The function  $g(b)$  may or may not be linear, such that any unknown rhetorical strategy is allowed.

In the competitive environment with a renegotiation scenario, I simplify the  $P(a,b)$  utility function. I reduce both Cleon's and Diodotus' proposals to fit a linear function of the form  $P(a,b) = a - b$ . The model also considers two utility functions, one for each period. The utility function  $u$  describes the voter's first period preferences. The utility function  $v$  describes the voter's second period choice. Utility is seen merely as a way to describe preferences. The proposal is a contract designed by the speaker as a function of a voter's choice denoted  $t$ . The speaker's cost is also a function of the voter's choice denoted  $c$ .

### **The Period 1 proposal versus the Period 2 proposal**

These assumptions imply that the voters who participated in a period 1 assembly meeting are identical to those who attended the meeting in period 2. The second meeting was very likely historically larger given the controversy involved in the first meeting.<sup>723</sup> Let us not become trapped by this technicality, but simply note that Thucydides describes the voters in both periods as the same body of people (i.e. they believed, they decided, they changed their mind, they voted again). Thucydides intentionally portrays the assembly as a unit with a collective consciousness.<sup>724</sup> Nonetheless, we shall later allow voters to vary in their sophistication. It will be shown that to know the degree of sophistication of each voter is not necessary to solve the Athenian assembly's decision problem.

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<sup>723</sup> Hornblower called my attention to this, see Bibliography on attendance.

<sup>724</sup> Thucydides frequently represents an army or a city, a collection of people, as a conscious unit. A population may hold the same opinion or have all different opinions. Thucydides also talks about the appearance of a unified opinion. Archidamos advises "The best and the safest thing [for a city] is that the many appear to observe one order" (*pollous ontas eni kosmoi chromenous phainethai*) (2.11). Alternatively, in Sicily, the land army on both sides watching the balanced sea-battle faced "much contest and conflict of opinion". (7.71) Or, when both armies cannot decide the outcome of a battle and both put up trophies (*tropaia amphoteroi estesan*) (4.134) The sea-battle of Syracuse includes all three types of collective consciousness; where the collective consciousness is unified, divided and individually unique.

Denote  $X$  is the set of feasible proposals. According to the function  $P(a,b)$  we can calculate how many beliefs are needed for a specific rhetorical strategy to be feasible. The decision rule  $P(a,b)$  gives us a numerical output  $x$ .<sup>725</sup> The speaker must decide what type of proposal to offer. The functions  $t$  and  $c$  map proposal alternatives onto the real number line. The speaker's profit is given by  $t(x)-c(x)$ .  $t$  is a function that may commit the voter to his first period choice of proposal. The function  $t$  is a contract which specifies a transfer from the voter to the speaker. The transfer is the voter's support for the speaker, i.e. when the voter accepts his proposal ( $t$  is the benefit the speaker gets from his proposal = that voter's vote.).  $c$  is a function that denotes the speaker's costs for devising a proposal, i.e. the effort a speaker exerts to devise a contract that promotes his objectives. The more beliefs a speaker must include the more effort he exerts in devising a proposal.

The voter evaluates his utility, otherwise called his willingness-to-accept a proposal, at each period. In period 1:  $u(x)-t(x)$ , the utility function of the voter is given by  $u$ . In period 2:  $v(x)-t(x)$ , the utility function of the voter is given by  $v$ . If a voter does not pick a proposal his utility is zero.

## Monopolistic environment

### Case for the sophisticated decision maker

How does a single speaker interact with a sophisticated voter? A sophisticated voter is a rationalist; his preferences don't change over the two periods because this voter seeks a proposal that forces him to commit to his first period choice. This means  $u(x)=v(x)$  so that  $v$  is bounded. This implies that if the voter chooses any other proposal he will incur an infinite fine in the second period, therefore  $u$  remains the preference. This is achieved by a contract that induces commitment. Generally the authority of law is the commitment device that holds a decision in period 1 as final. In

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<sup>725</sup> For the proposal  $x$  to be feasible  $P(a,b)$  must yield a non-negative output.

Pericles' words "in all public matters we abide by the law: we are obedient (ou *paranomoumen*) by fear of the authorities and of the laws (*twn nomwn*)".<sup>726</sup>

The most famous classical example of commitment is "Odysseus tying himself to the mast"<sup>727</sup> taken from Homer's *Odyssey*. The story goes that Odysseus has his sailors tie him to the mast of his ship because he wants to hear the sweet song of the Sirens.<sup>728</sup> In this way Odysseus resists behaving inconsistently. In period 1, Odysseus can foresee that in period 2 when he hears the Sirens his preferences will change.

In order to accept the Sirens' contract, i.e. to hear them sing, Odysseus must consider his preferences in both periods and optimize accordingly. In period 1, Odysseus wants to stay alive, his  $u$  preferences. In period 2, Odysseus will be persuaded to kill himself, his  $v$  preferences.<sup>729</sup> Odysseus must take a decision  $x^*$  that will make his second period preferences equal to his first period preferences. He therefore decides to tie himself to the mast, the optimal decision  $x^*$ , in order to accept the Sirens' contract to hear them sing in period 1. A period 1 contract conditional on surviving is represented by a contract  $t(x^*)$  being equal to his staying alive preference  $u(x^*)$ , such that  $t=u$ .

For any other contract conditional on a decision,  $x$ , that would not ensure his survival, Odysseus would have to pay an infinite fine in the second period. The infinite fine is death. Thus any other  $x=x^*$  is equal to joining the "heap of bones of rotting men" encircling the Sirens.<sup>730</sup> Odysseus stuffs the ears of

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<sup>726</sup> 2.37; CT 2. 301, for translation and see bibliographical notes on "the possibility that this whole phrase is an echo of the oath sworn by ephebes (recruits)".

<sup>727</sup> Commitment literature on Odysseus: Strotz (1956); Ashraf, Karlan, Yin (2005); Elster (1984); Ainslie (1992, 1993).

<sup>728</sup> Hom. *Odyssey* xii.39, 42, 44, 52, 158, 167, 198. In Homer the Sirens are only two, in Ovid's *Metamorphoses* they are three in number (xiv.64-92). Although a monopolistic environment implies one individual, a firm is not a single individual, but a collective with a single objective. The Sirens likewise are a few individuals with one same objective.

<sup>729</sup> In Homer, the Sirens are not portrayed explicitly as man-eaters, instead it has been argued that they spoke so sweetly that sailors would stay to listen to them and starve to death.

<sup>730</sup> Hom. *Odyssey* xii.45.

his crew with wax and as such the sailors are deaf to the Sirens and therefore not tempted. The crew is made to take the outside option and not accept the Sirens' contract.

### ***Profit and Utility***

The Sirens want to be heard and Odysseus wants to hear them. Both derive a profit and utility, respectively, when their desires are met. Odysseus seeks to maximize his utility by choosing a contract that allows him to enjoy the Sirens' service and not be harmed by it. The Sirens by offering their service will seek to maximize their profit taking into account their effort. The Sirens' profit is  $t(x^*) - c(x^*)$ , which means that their profit is a contract that Odysseus will accept minus the cost of effort in tempting Odysseus to stay. The Sirens profit from being heard, the longer one listens the better, is evidenced by the bones, denoted by  $x$ . Odysseus selects a contract that allows him to hear them for a limited amount of time, denoted by  $x^*$ .

Odysseus' commitment is in fact a constraint on the time he is willing to give up for his enjoyment of the Sirens' service. His decision rule is a rule that specifies a time constraint. If we combine both Odysseus' optimal utility given his decision and the Sirens' optimal contract given Odysseus decision we can see that the Sirens' profit is  $u(x^*) - c(x^*)$  because  $t = u$ . The optimal decision that induces a contract Odysseus will accept is one that yields the highest utility to Odysseus (i.e. staying alive) and the lowest cost to the Sirens' (i.e. the least effort in tempting Odysseus to stay).

This contract represents an Odysseus that follows the intertemporal preference relation  $\{\text{live}\} > \{\text{live, die}\} > \{\text{die}\}$ . The Sirens are represented here as a monopolistic firm facing a sophisticated consumer, Odysseus. In an assembly setting, this model describes the interaction between a single speaker facing a sophisticated voter. A sophisticated voter follows a commitment preference relation  $\{\text{accept}\} > \{\text{accept, reject}\} > \{\text{reject}\}$ . According to our decision rule, a sophisticated voter will pick an  $x^*$  that satisfies the  $u$  preferences or rules regulated by the function  $P(a,b) \geq 0$ .

The only way a sophisticated voter will accept the most persuasive proposal (a contract) is if the voter uses a decision rule that is binding. In the case of Odysseus, the only way he will accept to hear the Sirens' song (literally the most persuasive speech) is if he binds his body (a binding decision rule).

The voters in the assembly evaluate deliberative speeches by means of *doxa* (commonly held beliefs) and rhetoric (the use of persuasive arguments). Pericles, like Diodotus, says he must use "common beliefs of truth" (ἡ δόκησις τῆς ἀληθείας) to satisfy the individual wishes of his audience.<sup>731</sup> Thucydides also says Pericles is the most "persuasive in words" and wins because of this.<sup>732</sup> Thucydides throughout the *History* discusses the benefits and limitations of such a system.<sup>733</sup>

I will list the formal components to facilitate comprehension of the remainder of the analysis.

$x$  - decision

$x^*$  - decision that satisfies the decision rule

$t(x)$  - proposal

$t(x^*)$  - proposal that satisfies the decision rule

$u(x)$  - voter's willingness-to-accept (wta) a proposal in period 1

$v(x)$  - voter's willingness-to-accept a proposal in period 2

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<sup>731</sup> 2.35; Huart and Hornblower render it "the grasp of the truth"; The Prologue to Pericles' Funeral Oration (2.35-2.46) describes the difficulty that a speaker has to satisfy the willingness to accept of each listener in an audience. The bliss point is to speak at the mean (τὸ μετρίως εἰπεῖν). This is "the point" at which the listener still believes the speaker: this point is found by identifying the listener's self-image. In the context of praise for the dead, those praises (οἱ ἔπαινοι) spoken of others are bearable up to the point where each man believes himself capable of doing what he hears (ὅσον ἀν καὶ αὐτὸς ἔκαστος οἴηται ικανός), those praises in excess ... are disbelieved (τῷ δὲ ὑπερβάλλοντι αὐτῶν ... ἀπιστοῦσιν). Pericles sets the limits by stating that there is a range of arguments that will be believed and that after a certain point disbelief sets in. In order to attain  $x^*$  (μετρίως) or equivalently an aggregate common belief of truth, Pericles reveals his strategy in the last sentence: I must try to coincide the wishes and beliefs of each, as much as possible (χρὴ ... πειρᾶσθαι ὑμῶν τῆς ἔκάστου βουλήσεώς τε καὶ δόξης τυχεῖν ὡς ἐπὶ πλεῖστον.). This idea is captured by the pizza metaphor, where those praises in excess are anchovies, and the wishes and beliefs are pepperoni. The mathematical synthesis is appropriate because Thucydides in Pericles' speech describes the limit as a quantity: number of elements of praise. (see also Aristotle *Rh.* 1355a3-18, the more *endoxa* the more the a speaker is believed)

<sup>732</sup> 1.139; 1.145.

<sup>733</sup> 1.71 Corinthians; 2.40 Pericles.

$u(x^*)$  - voter's wta a proposal in period 1 that satisfies the decision rule  
 $v(x^*)$  - voter's wta a proposal in period 2 that satisfies the decision rule

### Case for the naive decision maker

Now imagine a voter who again evaluates a decision over two periods, say two days. The speaker offers him a contract (a proposal) that does not bind his preferences on the second day to match his preferences on the first day. The voter is allowed to change his mind in this contract.

In this case, the speaker and the voter “agree to disagree”, this means this is a model with no common prior beliefs. The voter believes his preferences in period 2 are going to be the same as those in period 1. As if Odysseus was to say to himself in period 1: “I will surely not be tempted by the Sirens!” Odysseus would be underestimating the powerful temptation of the Sirens. The speaker on the other hand believes the voter’s preferences will change in period 2. The speaker, like the Sirens, knows that if the voter does not bind himself to his first period preference he will change his mind. Therefore the speaker seeks to design a proposal that will maximize his profit over the two periods.

The voter believes he will maximize his period 1 preferences in both periods. This is represented by  $x^u$ . As such the voter maximizes his period 1 preferences  $x^u: \text{argmax } u(x)-t(x)$ . The speaker believes the voter will maximize his period 2 preferences  $x^v$ . As such the voter in reality maximizes  $x^v: \text{argmax } v(x)-t(x)$ .

The speaker’s profit is derived from a proposal that aligns his desired result from a voter accepting his proposal with the least effort in devising a proposal according to the voter’s period 2 preferences. This is represented by  $t(x^v)-c(x^v)$ . This implies that the voter will maximize his period 1 preferences in an environment where the optimal contract does not bind  $v$ . This is represented by  $u(x^u)-t(x^u)$ .

Since the speaker believes the voter's preferences will change, the speaker will devise an optimal contract by maximizing  $x^u, x^v, t(x^u), t(x^v)$ . Maximizing  $x^u$  involves devising a proposal  $t(x)$  that satisfies a given decision rule in period 1. Maximizing  $x^v$  involves devising a proposal  $t(x)$  that satisfies a given decision rule in period 2. Establishing a decision rule in each period implies that the thresholds of  $x$  are allowed to vary up or down the real number line (in either period this may involve a possibly negative transfer from the voter to the speaker, i.e. no vote). If the decision rules were the same in both periods, the speaker would be devising a proposal for a sophisticated voter. Thus,  $t(x^u)$  is the optimal proposal that satisfies a period 1 decision rule, and,  $t(x^v)$  is the optimal proposal that satisfies a period 2 decision rule. I will denote  $t(x^u)$  as  $T^u$  and  $t(x^v)$  as  $T^v$  from now on.

The common interpretation that the speaker's beliefs are "real" and the voter's beliefs are "imaginary" is due to the voter's naiveté.<sup>734</sup> The pair of decisions that allow a speaker to construct a proposal offered to a naive voter is essentially the speaker's *bet* over the voter's second period voting decision. The proposal delivered to a naive voter represents a bet because the voter and the speaker hold conflicting prior beliefs with respect to the voter's second period preferences.<sup>735</sup>

In the case of the naive voter the speaker's maximization problem is reduced to:

$$\begin{aligned} & \max(x^u, T^u, x^v, T^v) \quad T^v - c(x^v) \\ \text{subject to} \quad & v(x^v) - T^v \geq v(x^u) - T^u \quad (1) \\ & u(x^u) - T^u \geq u(x^v) - T^v \quad (2) \\ & u(x^u) - T^u \geq 0 \quad (3) \end{aligned}$$

We now have to consider three constraints instead of just one. The last constraint is almost identical to the constraint for the sophisticated voter.

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<sup>734</sup> Eliaz, Spiegler (2006).

<sup>735</sup> Spiegler (2011) 15.

Constraint (3) is a participation constraint regarding period 1 preferences, which describes what the voter expects to happen in period 2. This constraint, as we proved above, guarantees that the voter will choose {accept} in period 1. The other two constraints represent (1) the belief of the speaker and (2) the belief of the voter regarding the voter's second period preferences.<sup>736</sup>

The constraints (1) and (3) are binding in optimum, which means the constraints are equalities forcing the lower boundary of a feasible proposal to be fixed.<sup>737</sup> Constraint (3) must bind at optimum otherwise the proposals  $T^u$  and  $T^v$  can be increased without failing to satisfy the other constraints. For a similar reason constraint (1) must bind otherwise the speaker could include an arbitrary number of persuasive arguments and still satisfy all constraints. The reason why constraint (2) is not binding is because there is no need to put a limit on the voter's "imaginary" belief. The constraint represents the naive voter's "imaginary" belief that his first period preferences yield greater satisfaction in comparison to second period preferences.

Combining (1) and (3) we arrive at a condition that states:

$$\begin{aligned} T^u &= u(x^u) \\ T^v &= v(x^v) + u(x^u) - v(x^u) \end{aligned}$$

Now substitute the  $T^v$  proposal condition into the speaker's maximization problem for the naive voter,  $T^v - c(x^v)$ . This yields:

$$\begin{aligned} &\max(x^u, x^v) \quad v(x^v) - c(x^v) + u(x^u) - v(x^u) \\ \text{subject to} \quad &u(x^u) - T^u \geq u(x^v) - T^v \end{aligned} \quad (2)$$

We first solve the problem, ignoring constraint (2), with respect to  $x^u$  and  $x^v$ :

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<sup>736</sup> *Ibid.* 16, both conditions (1) and (2) are called Incentive Compatibility constraints. Constraint (3) is called an Individually Rational constraint, which serves to guarantee the voter's participation in period 1.

<sup>737</sup> *Ibid.*, and Appendix A, Spiegler explains why the constraints must be binding for the lower bound not to oscillate.

$$x^v = \operatorname{argmax} (v-c)$$

$$x^u = \operatorname{argmax} (u-v)$$

The constraint (2) says that the voter believes that his preferences today will be the same or better than his preferences tomorrow. There is no need to set a limit for how much better the voter believes today is than tomorrow, i.e. there is no need to set an upper bound. But it must still be satisfied under our new optimal conditions. As such we check by substituting  $T^v$  and  $T^u$  into constraint (2). We arrive at an expression that holds given our assumptions. The expression is optimized with respect to  $x$  and thus satisfies our assumption that the voter will reject the proposal in the first period if he is sure he will be overall dissatisfied in the second period, i.e.  $u(x) - v(x)$  must be equal to or greater than 0. The check through substitution yields the same solution as the unconstrained maximization and therefore the last constraint is satisfied.

Our initial conditions guarantee that  $\operatorname{argmax}(u-v)$  and  $\operatorname{argmax}(v-c)$  are either 0 or positive. If they are 0 they are the same and as such the optimal contract is trivially reduced to that of a sophisticated voter. On the other hand, if they are not the same, the overall satisfaction of the speaker over the two periods must be positive.<sup>738</sup>

There are more persuasive arguments in a proposal for a naive voter than there are in a proposal for a sophisticated voter. Recall that the optimal proposal  $T^*$  for a sophisticated voter was a compromise, i.e. payoff of 0 for the speaker. An optimal proposal for a naive voter yields a payoff greater than 0 and therefore is more profitable for the speaker. The speaker has more freedom in a proposal for a naive voter than in one for a sophisticated voter. That a speaker's proposal for a naive voter should yield greater profit

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<sup>738</sup> *Ibid.* 17; As a side note, the Corcyrean debate would be an excellent candidate for this type of analysis. However I have chosen in this paper to exclude a voter's considerations of risk, which I believe determined Athens' vote for an alliance with Corcyra. I intend to explore this elsewhere in another essay.

in comparison to a proposal for a sophisticate is an intuitive result.<sup>739</sup> The monopoly environment is shown to be exploitive, therefore, in so far as the naive voter gains less utility than a sophisticated voter.

### ***Maximization***

By saying that  $x^* = \text{argmax}(u-c)$  we are stating that  $\{\text{accept}\} = x^*$  is a proposal chosen in period 1 when both the voter and speaker make compromises. It is a very reasonable assumption, and quite commonly understood as the dual action of rhetorical persuasion convincing the voter to accept, while simultaneously inducing him to reject since the voter is wary that the speaker is possibly deceiving him. This is precisely Diodotus' line of thinking in his speech. "Persuasion" is evaluated by "a good citizen" in the following way. He "does not frighten away [i.e. discard] opposing speakers, but should [see] on an impartial basis (*apo tou isou*) who is the better speaker."<sup>740</sup> Cleon corroborates this view: "impartial judges (*apo tou isou*) rather than competitors are for the most part successful".<sup>741</sup> Ancient Greek persuasion followed structural guidelines.<sup>742</sup> The speaker's construction of a proposal and the voter's evaluation of it is the result of a system of

<sup>739</sup> Kahneman, Slovic, Tversky (1982) 494, The terms *intuitive* and *intuition* are commonly used to describe informal reasoning in economic thinking.

<sup>740</sup> 3.42.5, Diodotus is referring to speakers who are good citizens should evaluate another citizen's speech in this way, impartially.

<sup>741</sup> 3.37.4-5

<sup>742</sup> Hornblower (1987) 147ff. on Thucydides and the rhetorical handbooks, especially *Rhetoric to Alexander* 1422a. It is very possible that the authors of the rhetorical treatises, since the treatises were written after the *History*, were well versed in Thucydides. Modern discussions on the Mytilenian debate often follow the rhetorical guidelines on the "rhetorical prescriptions on proposing an alliance", or the "what is just" versus "what is advantageous", analysis in the *Rhetoric to Alexander*. The Mytilenian debate and the Corcyrean debate are similar in this way. This is why, as Hornblower suggests, I am careful "not to make the *Rhetoric to Alexander* the 'key' to Thucydides". (49ff16) My method generalizes with the "what is similar" versus "what is different" analysis for all possible types of tradeoffs. I use *doxa*, common beliefs, as a point of departure because Gorgias, Isocrates and other coeval rhetorical theorists thought of *doxa* as the only knowledge communicable. See Barker on how the speeches draw heavily on "gnomic expressions" (proverbial expressions) "as a readily useable, and thereby compelling, form of knowledge", or "sound-bites of community wisdom" in Th. 246ff144, and in general Lardinois (2001) 93-107. My definition of compromise incidentally interprets the meaning of *ta deonta*, or to say "what is appropriate", found in Thucydides methodology excursus. I do not offer any further insight here other than that my methodology assumes what "appropriate" was, in this particular case, given the information on beliefs in the text. Consequently, my interpretation has no affinity with the vast scholarship discussing the relationship on "what is appropriate" with "what was really said" in the speeches.

compromise. The speaker's proposal must include commonly held beliefs that may not be the most persuasive but will still win him support.

### ***Compromise and Maximization***

Diodotus says that "good advice, straightforwardly given, is no less suspect than bad, and it is equally necessary for a man urging the most evil of policies to use deceit to win over the populace and for one giving excellent advice to tell lies to make himself credible."<sup>743</sup> The speaker's optimal proposal  $t^*$  yields the minimum number of persuasive arguments since the sophisticated Athenian voter forces the speaker to maximize  $u(x)-t(x) \geq 0$ . The speaker giving either good or bad advice in this way can guarantee himself a vote, and this is all that matters. This is of course a very situation specific interpretation of compromise.<sup>744</sup>

Manuwald discusses the theme of "deceit versus truthfulness" in the speeches of Cleon and Diodotus.<sup>745</sup> He argues that Diodotus points out that "the necessity of deceiving one's audience in the public assembly, [is] a necessity under which, in his view, even a speaker with pure intentions is placed. Diodotus sees this necessity as the result of Athenian behaviour governed by the suspicion that someone might derive personal gain from the success of his speeches."<sup>746</sup> Diodotus is addressing the Athenians but he implies that any assembly meeting governed by suspicion would evoke the same necessity for compromise. It is implied so much so as to allow Manuwald to term this balance between deceit and truth as Diodotus' "demand for a substitute basis of truth". Diodotus uses the verb *pseudo* "to

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<sup>743</sup> 3.43.2

<sup>744</sup> See also in political science, Duverger's Law for compromise identified as tactical voting in a first-past-the-post two-party system; an example of compromise in use today is the Jagiellonian compromise, "Jagiellonian Compromise: An alternative voting system for the Council of the European Union".

<sup>745</sup> Manuwald (2009) 258.

<sup>746</sup> *Ibid.* 241-242 on 3.43.2f.

deceive", as Manuwald rightly translates, but for the purposes of fluidity, I call deceitful arguments persuasive arguments.<sup>747</sup>

The substitute basis of truth is a contract designed by Diodotus. It is a contract that maximizes the proposal of the speaker. It is intuitive that a speaker always seeks to use as many persuasive arguments while still being constrained by the incentive mechanism to use a substitute basis of truth. I defined this contract as  $P(a,b)=a-g(b)$ , where  $a$  is beliefs and  $g(b)$  the rhetorical strategy as a function of persuasive arguments. In the examples above,  $P(a,b)=a-b$  is a simple linear tradeoff, where the optimal tradeoff is where  $a=b$  for a sophisticate. The decision rules for the naive voter,  $x^u$  and  $x^v$ , are the outputs of some  $P(a^*,b^*)$  in period 1 and some  $P(a,b) = P(a^*,b^*)$  in period 2, respectively.

The term compromise denotes the conditions under which the sophisticated voter's satisfaction with the proposal equals his dissatisfaction with the proposal.<sup>748</sup> For the naive voter, the proposal is some mixture of similar beliefs and persuasive arguments which changes, i.e. like in the pepperoni-anchovy example. For the speaker faced with any voter, a compromise is when his persuasive arguments are weighted to the voter's requirements for similar beliefs. We are always maximizing the speaker's profit, i.e. his compromise requirements.<sup>749</sup>

### ***Conclusions on the monopolistic environment***

The model described for the sophisticated and naive voter in a monopoly environment is merely a base from which we shall work to try to understand why these proposals mirror each other in a competitive environment.

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<sup>747</sup> It is logical to assume that persuasive arguments may be true or untrue, just as Diodotus states.

<sup>748</sup> Similar to compromise effect, concave gains and convex losses.

<sup>749</sup> North (1990) 109, Agency theory addresses the evidence when legislators do not act in the interest of their constituents and instead act "on the basis of perceived number of votes he or she stands to gain or lose". Thucydides' model is addressing the best outcome for the speaker not the efficient outcome for the state's decision-making process. His discussion is akin to debates in political economy. "There is a vast gap between *better* and *efficient* outcomes, as a vast literature in modern political economy will attest."

Thucydides nonetheless demonstrates that compromise was a necessary condition for any proposal to be optimal.

### ***Welfare Analysis***

In the monopoly environment, proposals for sophisticates have outcomes that are efficient according to period 1 preferences. This is a result induced by a choice of {accept} that is optimizing  $u_c$ . The proposals in this case reveal a voter's surplus according to  $u$ . Proposals for naive voters, on the other hand, have outcomes that are efficient according to period 2 preferences. This is a result induced by a choice of {accept} that is optimizing  $v_c$ . The freedom in persuasive arguments the naive voter cedes to the speaker is strictly higher than his  $u$  willingness-to-accept for  $x^v$ . The proposal is also higher than his  $v$  willingness-to-accept  $x^v$ . Since the voter is naive,  $u$  is different than  $v$ , otherwise he would be sophisticated. Therefore, a proposal for a naive voter is always exploitative *ex post*.

The motivation behind the revelation that the naive's proposal is exploitative, after the first period has passed, is that the naive voter believes his preferences in period 1 are the same as those in period 2. The proposal for a naive voter is *ex ante* exploitative because he is certain in period 1 that he will act in accordance with  $x^u$  rather than  $x^v$  in period 2. The optimal proposal or optimal contract for the naive voter is unambiguously exploitative, whereas the proposal for the sophisticate requires that the speaker not exceed the compromise level of beliefs to persuasive arguments.

### ***What is a competitive environment? Does this need definition?***

We now introduce a second speaker and analyze the interaction of the speakers with their audience. The speakers, as well as, the audience understand there is a prize to be won. One proposal will succeed and the other will necessarily fail. The speaker with a successful proposal, in the quaintest sense of the term, wins. The debate is a competition, a game, or,

as Cleon and Diodotus call it, an *agon*.<sup>750</sup> An Olympic game is an *agon*.<sup>751</sup> The war between Athens and Sparta is an *agon*.<sup>752</sup> The debate in the assembly is an *agon*.<sup>753</sup> Like javelins and spears, in this ‘forensic’ competitive environment, rhetoric is the weapon used to win the prize.<sup>754</sup>

Rhetoric was the tool used for assessing predictions, or in game theory terms, comparing possible outcomes.<sup>755</sup> The rhetorical tactic employed by Cleon and Diodotus is characterized by Aristotle in the “Sophistical Refutations” as a common sophistic ploy. Cleon’s *reasoning* forces Diodotus’ to articulate a *refutation*.<sup>756</sup> Summarily, given an absolute expression, the second speaker must contradict the absolute expression by qualifying it as to manner of place or time or relation.<sup>757</sup> Aristotle adds, “It does not follow that unjust circumstances are preferable to just, but

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<sup>750</sup> For evidence in the 5<sup>th</sup> C. BC of the formal structure of a rhetorical *agon*, forensic or dikastic, see Lloyd (1992) 1-36. Like Euripides’ plays in the 420’s, Thucydides seems to evoke “the atmosphere of the courtroom”, p.36. From 34-36 Lloyd discusses the “impact of contemporary rhetoric on Euripides’ self-consciousness of agon speeches”. “This self-consciousness manifests itself in formal statements of the subject of the speech, concern for *taxis*, enumeration of points, explicit references to the act of speaking itself, and point-by-point refutation of the opponent.” This structure is very similar to what we find in the Mytilenian debate.

<sup>751</sup> 1.6

<sup>752</sup> 1.70

<sup>753</sup> Cleon: 3.37.4-5 Diodotus: 3.44

<sup>754</sup> Barker (2009) 203-263, for the debate as *agon* in Thucydides.

<sup>755</sup> Parker (1985) 322-324, offers a good synopsis of the role of rhetoric in fifth century notions of decision making. He states that “there seem to be two requirements if a decision is to be generally accepted: it must be reached by procedures that are admitted to be fair, and it must be believed to be based on the best available information. On the second point, the role of ‘experts’ and statistics in creating conviction in modern debates is obvious. ... The ordinary Athenian, [...] learnt by daily experience of issues great and small to believe that the sovereignty of the assembly was a reality, and a beneficent one. ... Thucydides’ Athenians draw a contrast in the Melian debate (v.103.2) between ‘having recourse to divination’ and ‘saving oneself by human means’ (*anthrypeiws*). ... there was scope for conflict as to where the boundary between the two spheres should be put; and new skills were developed in the fifth century that claimed to make inroads on the realm of the indeterminate. Rhetoric was a secular mode of divination, probing past and future by the light of ‘probability’, through ‘signs’ no longer magical. [Rhetorical arguments] There is thus a special aptness in the much-quoted Euripidean tag ‘the best prophet is the man who’s good at guessing’ (literally, ‘at calculating what’s probable’).” Eur.fr.973 Nauck (my emphasis), and ftn.88 for further literature on rhetoric and prediction; for “prediction” as “guessing” see Hawkins (1945) 222 in his review of “Theory of Games and Economic Behavior” by O. Morgenstern and J. von Neumann

<sup>756</sup> Arist. *Soph.* Ref.1.165a.

<sup>757</sup> Arist. *Soph.* Ref.4.166.b.

absolutely justice is preferable; but this does not prevent unjust circumstances being preferable to just in a particular case.”<sup>758</sup>

Indeed, one of Aristotle’s examples closely resembles Diodotus’ argument “The argument … deals with the question whether the same man can say what is at the same time both true and false; but presents apparent difficulties because it is not easy to see whether the qualification ‘absolute’ should apply to ‘true’ or to ‘false’. But there is no reason why the same man should not be absolutely a liar yet tell the truth in some respects, or that some of a man’s words should be true but he himself not be truthful.”

### ***Diodotus’ Conditioning of Cleon’s Proposal on Time***

Diodotus argues that a reference point effect of time should condition Cleon’s proposal, arguing that a decision influenced by *orge* and haste pursues benefits for the present whereas a decision influenced by reflection pursues benefits for the future.<sup>759</sup> He says, “I believe we are deliberating about the future (*peri tou mellontos*) rather than the present ([*peri*] *tou parontos*).”<sup>760</sup> Diodotus mirrors Cleon’s argument thus making each element necessarily equal to its opposite. Manuwald says that by changing the “viewpoint” from justice to advantage, “Diodotus turns a question of justice into one of mere utility”.<sup>761</sup> To which we add, Cleon’s utility in the present versus Diodotus’ utility for the future.

Recall that Cleon’s absolute statement that the law is trustworthy and the decree is not savage, is contradicted by Diodotus’ view that given present

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<sup>758</sup> Arist. *Soph.* Ref.25.180.b.

<sup>759</sup> 3.44.4,

<sup>760</sup> 3.44.3-4, I shall later make a distinction between Cleon’s immediate future predictions versus Diodotus’ distant future predictions, which Diodotus here qualifies as merely present and future. Voter’s are not evaluating discounted expected utility, voters believe that future predictions with any time horizon are equally uncertain. This is especially noticeable because the voters are evaluating rhetoric and not risk.

<sup>761</sup> Manuwald (2009) 250, and possibly because of the change in time horizon from immediate future to distant future. “Is there not a hint here [3.47.5] that the motion of Diodotus is free from the defects of Cleon’s, and that it *will* therefore bring about both justice and utility?”. As such, like the *eikastes* Themistocles, the further into the future you can see the better advice you can offer.

circumstances (first decision made in anger) the law is untrustworthy and that the decree is indeed savage.<sup>762</sup> Aristotle again affords us with another template to establish what occurs in the mind of a voter when faced with our choice between: A is true, B is false but simultaneously A is also false and B is also true. “If that which is good becomes evil and that which is evil becomes good, they would become two; and of two unequal things each is equal to itself, so that they are both equal and unequal to themselves.”<sup>763</sup>

This is the force that induces the vote to split. A visual example of a voter trying to decide which proposal to pick would be to imagine him flipping a coin; for both arguments are correct and incorrect at the same time. Now let us incorporate all the players, the conditions and the rhetorical structures into an abstract framework in order to verify whether a predictable pattern emerges.

### ***Introduction to a competitive environment***

The competitive environment is a point of departure in any analysis of Thucydides' debates. As we saw before, a single speaker offering a proposal to a sophisticated voter makes zero profits and the voter evaluates his intertemporal utility  $u-v$  at zero. A monopolist offering a proposal to a naive voter makes a strictly positive profit since his proposal is exploitative given  $u-v>0$ .<sup>764</sup> There are then two types of optimal proposals: 1) the perfect commitment devices for the sophisticates 2) and the “betting” proposal for the naive voters.<sup>765</sup> Competition, on the other hand, will be shown to eliminate the exploitative tendencies of a proposal aimed at a naive voter.

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<sup>762</sup> Aristotle also gives a good example of how expediency is an oft used argument in this setting, Arist. *Soph.Ref.25.180.b*. Scholars generally see the rhetorical debate as a debate between justice and expediency.

<sup>763</sup> Arist. *Soph.Ref.30.181.b*.

<sup>764</sup> Spiegler (2011) 17, 21.

<sup>765</sup> *Ibid.* 18.

### ***Assumptions***

Assume both speakers are identical and face the same population of voters. The voters possess, as before, the same first period and second period preferences, but they are able in different degrees to predict future preferences. The voters' types are unknown to the speakers.

### ***Solution***

In the solution proposed here it follows that, if two proposals are offered in period 1, each respective type of voter will pick the proposal that best suits him. The sophisticate will find the naive proposal exploitative because he foresees that the contract of the naive voter yields an inferior utility, while the naive voter will prefer the exploitative proposal because he makes compromising judgments at each period individually. In this way the voters, choose a proposal from the union of both the speakers, and as such each is committed to his proposal in period 2.

Both Cleon's and Diodotus' proposals are a prime example of this if we assume that the proposals were both made in period 1. Cleon uses the Athenians' long established trust in the rule of law as a means to convince the assembly of their need to remain enraged and not rescind the decree. The rule of law thus implies the correctness of their period 1 decision. Diodotus' does the opposite. He argues that their period 1 rage could not be stopped even by the rule of law as a means to convince the assembly that the rule of law is untrustworthy.<sup>766</sup> We see that in both proposals the speaker and the voter are forced to compromise. Notice that the voter holds two beliefs, that the rule of law is trustworthy and that the decree is savage.<sup>767</sup>

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<sup>766</sup> Manuwald (2009) 249-255, esp. 252.

<sup>767</sup> This rendition of the Mytilenian debate resembles Spiegler's (2006) example of a multi-issue model MDM. The multi-issue in our case arises as a result of the two-period interaction and not because two issues are being debated simultaneously. Spiegler's example is: There are two issues "death penalty" and "abortion rights". In the USA, the right wing agrees with the first and disagrees with the other, whereas the left wing disagrees with

The voter is offered two choices. Cleon's proposal argues that the rule of law is trustworthy and therefore that the decree is not savage. The voter should choose to retain his beliefs regarding the rule of law and reject his beliefs regarding the savage decree. Diodotus' proposal argues that the rule of law is untrustworthy and that the decree is indeed savage. The voter should choose to reject his beliefs regarding the rule of law and accept his beliefs regarding the savage decree. The voter must choose to accept one belief and reject the other, but which one is entirely his choice. Both speakers offer the same type of compromise. Both are optimal proposals that lead to different outcomes.<sup>768</sup>

We discover that even though the naive proposal is exploitative in a monopolistic environment, in a competitive environment the speaker is induced to offer a steadily less exploitative proposal. The speaker devising a proposal for a naive voter is simultaneously competing with a sophisticate proposal of the other speaker. His proposal then must be at least as good as the other proposal for as many voters as possible to accept his proposal, i.e. to increase his chance of winning. Remember, the speakers here are assumed to be ignorant of the proportion of naives to sophisticates in the audience.<sup>769</sup> Competition induces a symmetric Nash equilibrium where the

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the first and agrees with the other. In addition they must argue in accordance to two world views "sanctity of life" and "consistency with constitutional law".

<sup>768</sup> Barker (2009) 248, 254. The strongest rhetorical strategy in this episode is usually interpreted to be Cleon's. Barker on Cleon comments that "with no clear cut solution ... Thucydides still leaves his readers exposed to the full force of Cleon's powerful rhetoric". On Diodotus, he says "We have wanted Diodotus to win and acclaimed him. Yet his victory, not only at the practical level but also at the theoretical level, is unsatisfactory." This chapter shows that both strategies were equally matched, which is more in keeping with Thucydides' own declarations that the speeches were "equally matched".

<sup>769</sup> Spiegler's model specifies that both proposals are offered simultaneously, which is the driving force behind the equilibrium result. Not knowing the distribution of naives to sophisticates induces both speakers to offer proposals that are non-exploitative. One proposal is already non-exploitative because it is designed for the sophisticate. The other proposal must be non-exploitative because the speaker offering a naive proposal does not know the audiences' distribution of sophistication and therefore optimizes seeking to steal voters away from the opponent resulting in a non-exploitative proposal. Because our environment is rhetorical, one proposal necessarily induces the format of the reaction proposal. In a way the first speaker moves simultaneously for both speakers, on an argumentative plane. Diodotus clearly optimizes a naif proposal such that it mimics a sophisticate proposal in the context of this model.

speakers have the same strategy and offer proposals that are a perfect compromise.

While the voters differ in their first period evaluations of the proposals, they all make the same compromise decision conditional on accepting a given proposal. Therefore the competitive environment illustrates why two speakers would be induced to offer two “identical” proposals. Neither speaker has an incentive to deviate from his strategy.<sup>770</sup> The proposals are not identical, but as I said before, merely symmetrical, as was made clear through their rhetorical strategies.

### ***Competition and Renegotiation***

Still our speakers are not identical and the voter’s first period choice is renegotiated in the second period. It is only now that we will allow all the elements of Thucydides’ debate to operate together. Whereas the monopoly environment shows the possible arrangements that a speaker can propose to his audience conditional on their degree of sophistication, the competitive environment allows two speakers to compete for a population of voters and demonstrates that the proportion of naifs to sophisticates is irrelevant because the proposals offer the same compromise to different voters which results in a symmetric Nash equilibrium. What if there were to be a renegotiation in the second period? Or more importantly, what sort of preferences would induce a second period renegotiation?<sup>771</sup>

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<sup>770</sup> Spiegler (2011) 18-19; Osborne (2004) 52; Osborne, Rubinstein (1994) 14-15, 305-306, offer a simple then an axiomatic definition for a Nash Equilibrium. Summarily, a symmetric Nash Equilibrium must be Pareto efficient, where no player is made better off if he deviates from his strategy. And further, a NE can only be symmetric if the problem is symmetric. “A problem is symmetric if any definition of an agreement by means of a formula in this language defines the same agreement if we interchange the names of the players.” In our case we can say that the solution is a symmetric Nash Equilibrium for a strictly competitive game, see p.21.

<sup>771</sup> Spiegler (2011) 34-36, the following model is the same as the one proposed by Spiegler. The outcomes are different from the original model as a result of the constraints placed on second period proposals in the event of a renegotiation.

Thucydides' voters with dynamically inconsistent preferences show us how. In Period 1 a voter's willingness-to-accept a proposal is given by  $u$ , which is a function that follows the preferences of an angry, irrational decision maker. Preferences change over time and in Period 2, the voter's willingness-to-accept a proposal is given by  $v$ , which is a function that follows the preferences of a calm, rational decision maker. First period preferences are *inefficient* in comparison to second period preferences.

Assume now that the voter accepts a proposal in period 1. In period 2 he is presented with a new alternative: a new proposal in addition to the old one he accepted. We assume the new speaker did not get sufficient votes in period 1 and therefore enters the renegotiation phase with a new offer. This new proposal competes with the proposals the voter accepted in period 1 but did not win. Notice I say *proposals* and not *proposal*. This is because there were other proposals in period 1 which voters may have voted for that did not win, including Diodotus' unrecorded proposal. It is necessary to account for these other proposals in order to establish a competitive environment in both periods.

This market structure resembles the debate far more than the previous scenarios. In period 1, Cleon makes a proposal which is one among many proposals and wins. In period 2, Cleon's proposal is still available and Diodotus offers a new proposal to compete with Cleon's proposal. These conditions hold for an environment that is competitive and which we assume has no constraints on the proposals that speakers can offer in period 1 to account for the unstable environment.

### ***Solution***

A renegotiation in the second period can work around any commitment device chosen by a sophisticated voter in period 1. The Athenians are sophisticated *a priori*, so let us consider the case of a sophisticated voter first. Since there are no constraints on a proposal in period 1, we can say

that the speaker can use any sort of combination of beliefs and persuasive arguments as long as it maximizes  $u-v$ . The competitive proposal  $t(x^*)$  induces an action  $x^*$  that maximizes  $u-c$  and  $t(x^*)=c(x^*)$ , which is the acceptance of the voter equal to the speaker's cost. As we can see,  $x^*$  does not maximize  $v-c$ . The speaker therefore offers a new proposal  $t_r$ , which induces an action  $x_r^v$  that maximizes  $v-c$  and an acceptance  $t_r(x_r^v)$  such that  $t_r(x_r^v) > c_r(x_r^v)$  and  $v(x_r^v) - t_r(x_r^v) > v(x^*) - t(x^*)$ . The two last expressions say that both the speaker and the sophisticated voter will be better off choosing the new proposal in period 2.

### ***Renegotiation proof proposal***

The only way to forestall any possibility of a renegotiation in period 2 would be to have the first proposal induce an  $x^*$  that maximizes  $v-c$  and the acceptance  $t(x^*)=c(x^*)$ . This proposal enforces a commitment device that is distorting the interaction of the speaker with the voter in period 1. It is this distortion which we seek to explain, and for which Thucydides provides the solution. The proposal with a commitment device chosen by the voter in period 1 enforces an optimal action that is *inefficient* in period 1 according to the period 1 self. Conversely, the commitment device enforces an outcome that is *efficient* in period 2 according to the period 2 self. Let us see an example of a voter who will renegotiate and another where a voter refuses to renegotiate.

An example of a case of renegotiation is when you get drunk at a bachelor party in Vegas and in the euphoria you marry a complete stranger. On the following day you return to your normal state and void the marriage contract. You marry her in period 1 because you want to at that point. While drunk you are optimizing your first period utility but it is inefficient in the context of your two period behavior. In the second period you are offered the choice to sign another contract to cancel the first one. Because you prefer to rescind the contract instead of commit to it, the first period commitment must be inefficient. In the second period you are now optimizing according to your

second period preferences. You have the choice in period 2 to commit to your inefficient period 1 contract or take the new contract to void it. This stereotypically American example is intended to induce the answer “you prefer to sign the divorce”.

A renegotiation proof commitment device is also simple to devise. You decide to skydive. You sign the company contract that stipulates that the company has no responsibility in the case of an accident. In mid flight, as you look outside the door of the plane and your instructor jumps out with you attached to him, the excitement is quickly replaced with panic. The contract signed in period 1, while still on the ground, still ignorant of the immediately dangerous situation you are about to face, cannot be renegotiated while you are falling through the sky. You cannot escape your physical location, which commits you to your first period choice, as you fall through your second period with a faulty parachute.

The assembly at Athens faces a similar choice with a single difference. What if renegotiating or committing to a proposal in the second period was indifferent to the voter? In accordance with the rhetorical reply Diodotus was required to make, his rebuttal had to be a contradiction of Cleon’s proposal. Diodotus does this by taking Cleon’s predictions for the immediate future and argues in favor of his predictions for the distant future. Both arguments incorporate the beliefs of the voters and intersperse persuasive arguments to suit their desired outcome. Given, that both immediate future and distant future predictions are valid, as I will show later on in the context of the *History*, the voter is equally well off choosing either proposal.

### ***Observable versus unobservable actions***

Manuwald’s problem of Diodotus’ “substitute basis of truth” in game theory is called the “Principal-Agent Problem”. This problem is characterized by a principal (a firm) who wishes to hire an agent (a manager) for a one-time project. The project’s profits are affected by the agent’s actions. If the

agent's actions are observable a contract can be designed to specify the exact actions required of the agent and the compensation the principal must provide. If the agent's actions are unobservable a contract cannot specify exact actions because whether the agent fulfilled his obligations or not is unverifiable. The problem is to design a mechanism, a contract, that will induce the agent to act in the principal's interest. The principal must design the agent's compensation scheme such that indirectly he gives the agent the incentive to take the "correct action" (the actions that the agent would have performed had his actions been observable).<sup>772</sup>

Diodotus asserts that a speaker's actions are unobservable and must be subject to a contract for an observable immediate benefit of persuasion. Any proposal that discusses future profit or benefit, is perceived by the audience to be an "uncertain suggestion of profit".<sup>773</sup> Immediate future or distant future profits are equally viewed as uncertain, whereas the voter can assess a proposal and derive immediate utility from being persuaded by one speech or another.<sup>774</sup>

Future predictions in general are not verifiable in the immediate present, and thus the voter is unable to enjoy any utility, but only the prospect of it. In a huge simplification of the proposals, I argued that from two established beliefs one proposal upholds one belief and rejects the other. The only rhetorically fit reply is to contradict the argument by reversing the valence of the beliefs in the first proposal. This results in the two proposals offering temporally distinct but identical predictions, or future utilities, with equally persuasive rhetorical structures. The voter is indifferent between the two

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<sup>772</sup> Mas-Colell, Whinston, Greene (1995) 478ff.

<sup>773</sup> 3.43.1

<sup>774</sup> I believe that when Cleon says "You sit here looking more like spectators of the sophists than decision-makers for the city", he refers to maximizing immediate utility of costs and benefits in contrast to maximizing expected utility of costs and benefits; North (1990) 109-10, North would say that the speakers and voters are characterized as possessing "the same information and the correct model [decision rule] to accurately appraise the consequences" such that "all parties have access to the decision-making process". North would also say that this does not approximate the reality of "the most favorable modern institutional framework". North believes this model to be the solution that satisfies socially efficient decision-making. Yet here we see that Thucydides shows us how the Athenian version of this type of model is flawed, or socially inefficient.

proposals. The voter's indifference is induced. Thus the outcome of the vote was recorded as an almost equal split.

### ***Solution of the Mytilenian Debate***

Cleon's  $x^*$  proposal induces Diodotus'  $x_r^v$  proposal. If  $x_r^v$  and  $x^*$  are equal to each other numerically, they both maximize  $v-c$  and proposals,  $t_r(x_r^v)$  and  $t(x^*)$ , respectively. These proposals are thus also equal to each other. If both speakers, the entrant Diodotus and the incumbent Cleon, offer equally valid proposals, the voter in period 2 is indifferent to keeping his period 1 proposal or changing to the new proposal. This induces the same result we saw in the competitive environment with sophisticated and naive voters, both proposals suit either type of voter.

As in the standard competitive environment, a symmetric Nash equilibrium is replicated, with the distinction that the voter is allowed to act *inefficiently* in the first period if he is given the opportunity to renegotiate in the second period.<sup>775</sup> This scenario induces a split in the vote since both types suit both proposals. The sophistication of the voter is made irrelevant by the decision process itself.

### ***Unconstrained first period proposal: orge and pleasure***

The assumption that the first period proposal should have no constraints fits our scenario perfectly. As I argued above, surprise led to anger, which in turn magnified the offense of the Mytilenian demos. As Cleon reveals *because the Mytilenians were the first they are the worst*. Anger, leading to a savage retaliation, is not exclusively explored by Thucydides. Aristotle elaborates a very similar structure to that devised by Thucydides with a

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<sup>775</sup> The reason we have a symmetric NE as a result of the MDM and multiselves models is because I assume that my voter's decision rule is not speaker sensitive. I assume that the voter's evaluate the speeches solely on the content of the speeches in period 2 and not on the character or influence of the speaker. Therefore I assume that the arguments of the speaker are affected by his character, as we will see shortly with Cleon in the first period, see Spiegler (2006) 389.

single distinction. He adds to the process of magnification the role the pleasure one derives from revenge.

In addition to Thucydides' rule of magnification, Aristotle in the *Rhetoric* defines the causes and consequences of anger.<sup>776</sup> Anger results from an unexpected shock to some underlying emotion that by belittling your present state has prepared the path to anger. The present state Aristotle suggests is war. The surprise induced by a Peloponnesian fleet whose intention was to deprive Athens of her "daily wants" is Aristotle's belittling element: "one at war [is easily stirred to anger] by things related to the war".<sup>777</sup>

Aristotle adds that anger is easily stirred when one happens to be expecting the opposite treatment.<sup>778</sup> The Athenians expected the Mytilenians to have been faithful given their privileged status in the Athenian league. Their surprise at Mytilene's a long seated desire for defection, evidenced by the Peloponnesian fleet in the Aegean, moved the Athenians to anger. Kennedy writes that "Aristotle realized that outbursts of anger often result from some relatively minor slight that represents the 'last straw' to someone under stress."<sup>779</sup>

Once a person is consumed by anger, how do preferences change? According to Aristotle, anger is a state of mind that is pleasurable, and derives pleasure specifically from retaliation, i.e. revenge. Aristotle quotes the *Iliad*, which was well known to have revolved around the "rage of Achilles" as Homer's opening hexameter to the poem suggests. Aristotle says, 'Thus it is said of rage [*thymos*], "A thing much sweeter than honey in the throat. It grows in the breast of men."<sup>780</sup> The assembly was stirred to anger and derived pleasure from the prospect of revenge. (Cf.7.68.1-2) The greater retaliation a proposal offered the more willing a voter was to accept

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<sup>776</sup> *Rhet.* 2.2.1-27

<sup>777</sup> *Rhet.* 2.2.10

<sup>778</sup> *Rhet.* 2.2.11

<sup>779</sup> Kennedy (2007) 118 ft.17.

<sup>780</sup> *Ibid.* 116, translation and *Iliad* 18.109.

it. Through this process of maximization, the assembly as a whole accordingly voted for a savage decree.

The marked similarity between Thucydides' and Aristotle's formulations is that, for both, the degree of magnification is unbounded, i.e. for the former the worst offense requires the worst punishment they can devise, for the latter the greater the revenge the greater the pleasure. This is our final definition of magnification.

### ***Cleon's period 1 proposal***

The assembly's collective convulsed state of mind can now be used to describe Cleon's maximization problem in period 1. Aristotle states that those who think themselves superior and deserving of respect from those inferior in power, ability, or wealth derive great pleasure from anger and retaliation. He again quotes the *Iliad*, "Great is the rage of Zeus-nurtured kings".<sup>781</sup> Cleon is called the most violent of citizens in the narrative (*biaiotatos ton politon*) and the most influential, such that his pleasure deriving from retaliation would exceed that of any other citizen. Cleon's insistence on anger throughout his speech is meant to call particular attention to how he himself is filled with anger. Cleon is mentioned in Aristotle's discussion on anger at the outset, almost as if he had this very episode in mind.<sup>782</sup>

Anger induced by surprise created an environment that would allow Cleon to propose whatever he desired by amplifying or minimizing evidence as he pleased. The savage nature of the first proposal, therefore, was most likely at Cleon's instigation. Among all other proposals his, it is implied, would have been the most savage. Any proposal he made in period 1 would be the most violent and the assembly would be willing to accept it under the strain

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<sup>781</sup> *Iliad* 2.196.

<sup>782</sup> Glazer and Rubinstein (2001) design a debate mechanism for a single period debate that is bounded. If there was no bound the planner's problem would be trivial. But a two-period environment is introduced; the unbounded first period is no longer trivial because the voter and speaker maximize over two periods, where the second period is bounded.

of irrational behavior. The voter would derive greater and greater pleasure from his machinations of revenge. In Thucydides' words, the voter would seek to choose the worst punishment available.

Mikrogiannakis notes that "Cleon, the most straightforward of demagogues, acted perhaps in keeping with his own beliefs. He proposed an extreme solution." Still, his proposal would only remain as a commitment device because of the established Athenian trust in the rule of law. Spiegler notes that:

"The possibility of renegotiating commitment devices is interesting from a legal point of view. According to a powerful tradition in legal theory, when two parties agree to renegotiate an existing price scheme [Cleon's proposal], the court should not void the newly signed contract. However, the rationale behind this libertarian<sup>783</sup> stance is typically that the renegotiation was a result of new information, whereas in our case the renegotiation is a result of *predictably* changing tastes. The ability to enforce commitment contracts thus calls for a legal doctrine that acknowledges the distinction between these different motivations for renegotiation." (his italics)

The ultimate interpretation is, then, that the Athenian sophisticated voter suffers a cognitive hiccup. Although the voter is *a priori* sophisticated he takes an inefficient action in period 1 and then is forced to optimize again in period 2, just like a standard naive voter. In the event period 2 actions were already optimized in period 1 (which essentially means that he took a naive decision) then he is committed to his period 1 action in period 2. Further, if the renegotiation proof proposal is equal to the new proposal, only then is the voter indifferent between both types of proposals; the commitment proposal and the renegotiation proposal.

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<sup>783</sup> Rothbard (2002) 17, Libertarian theorist Murray Rothbard argues that "the very existence of a natural law discoverable by reason is a potentially powerful threat to the status quo and a standing reproach to the reign of blindly traditional custom or the arbitrary will of the State apparatus."

## Randomization

The voter who is sophisticated or naive in period 2 knows he made a naive move in period 1. The sophisticate finds himself indifferent between committing or renegotiating as the benefits offered by the old and new proposals are equal. Likewise the naive voter is indifferent between both proposals. A voter of any type is indifferent to his choice to renegotiate or commit.<sup>784</sup>

It was under these conditions that the assembly vote at Athens in 427 BC made a desperate attempt to correct its mistake of magnification, but was incapable of deciding what to do. They could correct their mistake, showing weakness in their reprisal against an offender, and thus encourage other subordinate states to revolt. Or they could justify the mistake, as a casualty in the process of law and as a tyrannical move to instill fear into other subordinate states. This suggests that the voters were forced or rather *induced* to randomize.

Harmgart, Huck and Muller in “The Miracle as a Randomization Device” argue that the medieval church followed such randomizing reasoning. The church uses an optimal randomization device, the miracle, to condemn or forgive sinners. “If absolution is always granted there is no deterrence. And if it is never granted there is no incentive to repent. Thus, the choice

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<sup>784</sup> Schelling (1960) 175ft.2, “One can interpret mixed strategies in zero-sum games as a means of introducing continuity of strategy into a discrete-strategy game [i.e. continuous possibility of proposals with two possible outcomes, convict or acquit] that has no pure-strategy saddle-point [i.e. there is no “reduced” sentence, the voter chooses whether the Mytilenians live or die, such that conviction leads to death and acquittal leads to life], thereby converting it into a game that does have a saddle-point. This interpretation of the role of mixed strategies in zero-sum games is not so different from their role in the nonzero-sum games. One can flip a coin to “average” heads and tails, to create (in an expected-value sense) a strategy halfway between heads and tails.” He goes on to say that the purpose of randomization is that we randomize “to prevent the opponent’s anticipation of our actual strategy choice”. In our case we are keeping the opponent, the first period self, from anticipating the second period self’s actual choice. “The machinery of choice, the procedures for recording and communicating a choice [i.e.  $U(a,b)$  decision rule], and any advance preparations required by the outcome of the random process [i.e. symmetric proposals] must remain inaccessible to his [i.e. period 1 self’s] intelligence system.”

whether or not to grant absolution must be random.”<sup>785</sup> The church must randomize because it cannot offer a “reduced” punishment. It has only one punishment available, to condemn a sinner to hell.

Like the church, our voter is faced with only two choices, convict or acquit, with the important difference that the voter’s randomization was induced in this particular case by the proposals of the speakers. Cleon argues that if the voters choose to absolve there is no deterrence, and Diodotus argues that if they choose to convict there is no incentive to repent. The Athenian commitment to the rule of law will deter other allies from revolting.<sup>786</sup> Diodotus argues that the death penalty has “no deterrent effect” because if a state revolts it will resist to the end, i.e. it has no incentive to repent.<sup>787</sup>

The concept of randomization here is why the vote only by chance sided with Diodotus’ proposal and there was no savage punishment against the Mytilenian population.<sup>788</sup> The assembly was faced with Schelling’s dilemma. The period 2 choice to act rationally or irrationally depended on whether Cleon was able to convince the assembly that their first period irrational decision was the Pareto efficient strategy choice or not.

### **Cleon’s no deterrence**

Fifteen years later Cleon’s prediction is shown to be correct. An interesting turn of events led to a chain reaction of revolts. The revolt of Chios in 412 BC, began with a planned arrival of some of their own oligarchs with Alcibiades while the members of the Chian council happened to be meeting. The Chians in the council were taken by surprise by their arrival and were more easily intimidated to vote for revolution. The revolt of Chios, another of

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<sup>785</sup> Harmgart, Huck and Muller (2007) 3.

<sup>786</sup> 3.39.7-8; 3.44.3-4

<sup>787</sup> 3.45

<sup>788</sup> An Athenian assembly could have any number of voters. Still it was common for an assembly to host a number of voters in the thousands. Although these numbers seem enough to have divided the vote equally if in fact there was a strict indifference between the proposals, a 50/50 gamble, like the toss of a coin, has a probability of  $\frac{1}{2}$  for heads or tails as the number of tries tends to infinity. Two or three thousand voters would have still randomly split the vote into *almost* equal halves.

the most powerful allies of Athens, encouraged other states to revolt as well. First Chios then Erythraea revolted, all as a result of one precipitous decision of the Chian council members. It is quite clear that while neither Diodotus' nor Cleon's predictions came true in the near future, revolts did occur in the fashion that Cleon predicted but only many years into the future.

In 412 BC, when one of the most powerful allies revolted the rest were not willing to keep quiet.<sup>789</sup> The two episodes are generally parallel, the later one a synoptic version of the events at Mytilene. Both describe that by capturing those who see your fleet, you avoid detection, i.e. "there was no news of them".<sup>790</sup> Compare the oligarchs' fleet that captures all those it encounters in order "to remain hidden"<sup>791</sup> to the fleet of Alkidas that does the same and thus remains hidden by "accident".<sup>792</sup> This is how to provoke surprise, to move second as Tsebelis has shown.<sup>793</sup>

The Mytilenian episodes' most striking resemblance to the events of 412 BC is that what happens by chance with Mytilene in 427 BC by 412 has become intentional tactics. "The people [of Chios] were amazed and shocked (*en thauma te kai ekplexis*). The few [oligarchs] had so arranged it that the council should be sitting at the time, and after speeches ... the Chians and immediately after the Erythraeans revolted from the Athenians." As Tsebelis showed, the people of Chios made the first move and the oligarchs made the second move, or rather a "surprise attack".

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<sup>789</sup> 8.15

<sup>790</sup> 3.32 and 8.14

<sup>791</sup> 8.14

<sup>792</sup> 3.32

<sup>793</sup> Hidden future events predicted, see Themistocles at 1.138; for mention of the equal status in the empire of Lesbos and Chios in the Mytilene episode, 3.10.5-6.

### Shock wave

The Chians' revolt also provoked surprise among the Athenians' surprise: they were shocked (*ekplexeos*) by the revolt of their most powerful allies. Indeed, they were so shocked that they removed the penalties intended to inhibit any proposal to use their reserve fund of 1000 talents, which they had previously jealously guarded to be used only in the case of a direct attack on the city. Just as the oligarchs of Chios shocked the Chians and thereby caused them to revolt, so this revolt in turn so shocked the Athenians that it caused them to revoke the law of the 1000 talents. This is what we would call a "shock wave".

From Thucydides' narrative, we know that the voters on the first day made an uneducated decision and on the second day returned to their normal level of sophisticated decision making. The voters in the assembly "all" made a naive decision on the first day, on account of a surprise, a shock, such that they were reduced to one same impulse, one same state of mind, that of *orge*. On the following day they returned to their normal state as sophisticated voters. Realizing their mistake, they call for another assembly to reconsider the dispatched decree to kill the male population of Mytilene and enslave its women and children. Two politicians with opposing agendas competed for the assembly's votes. Both speeches were rhetorically matched, balanced by Diodotus' refutation. The voting population could have been divided into any proportion of naive and sophisticated voters, evidenced by the fact that the proposals offered intangible future benefits. The voters were thus forced to choose an optimal proposal as a result of a compromise between their established beliefs and the structure dictating rhetorical persuasive arguments. Thus, Diodotus' victory was a result of chance, i.e. some exogenous stochastic process.

Thucydides' way, in my view, of calling attention to the nature of chance was by "unrealistically" portraying the simultaneous arrival of the second ship with the moment Paches' was about to execute the decree. I say

unrealistically because Strabo, a Greek historian and geographer, in the early years of the first century AD wrote differently. Strabo writes that the second ship bearing the new decision from the assembly arrived one full day before the set date for the execution.<sup>794</sup> Thucydides' dramatic conclusion evaporates which changes the whole scenario.<sup>795</sup>

### The Drama

According to Thucydides, the first ship was sent immediately (*kata tachos*) to execute the decree. Strabo on the one hand records that the generals (Paches in particular) had received an order to wait. Diodorus, another Greek historian, writing in the first century BC, nonetheless corroborates Thucydides. According to Diodorus, the second ship arrives after the decree was read.<sup>796</sup> According to Thucydides, Paches read out the decree and was about to execute the orders when the second ship arrived.<sup>797</sup> "By just so much [*para tosouton*]<sup>798</sup> did Mytilene escape its peril".<sup>799</sup> Diodorus and Thucydides give similar accounts although Thucydides allots slightly less time than Diodorus.

Mikrogiannis argues that "If we accept that a deadline was given and Paches was advised to wait, then this is a reasonable explanation for the exhaustive re-examination of the whole subject by the *ekklesia* of the *demos* and the taking of a new decision."<sup>800</sup> Thus, given Strabo's account, the

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<sup>794</sup> Strabo 13.2.3

<sup>795</sup> Mikrogiannakis (2006) 44, 50, this justifies my initial assumption that the assembly is assumed to "know" how much time they had to renegotiate before sending off the second ship.

<sup>796</sup> Diodorus 12.55.10

<sup>797</sup> 3.49.4

<sup>798</sup> Rhodes (1994) 95, renders the phrase "That is the degree of danger to which Mytilene had come."

<sup>799</sup> 3.49.4

<sup>800</sup> Mikrogiannakis (2006) 45, adds that "Our historian could not avoid the temptation to give an exceptionally moving literary flourish, with the thing being decided in the nick of time. As a historian who teaches (without stating so) how we deal with critical situations, he indirectly advises us that the more time is reduced between two phases and things are balanced on a knife edge, all the more effective is the effort for him who is negotiating the matter."

question whether the assembly was to retake their vote in vain is food for skeptics.

### The Chance Wind

In the event that they had called for a vote in the Heliaia and the outcome was a *cheirotonia anchomaloī*,<sup>801</sup> the equal show of hands, the appropriate procedure would have been to call on the “vote of Athena” which sided in favor of the accused.<sup>802</sup> Thucydides does not tell us explicitly, but he does emphasise the approximately equal show of hands (*en tei cheirotoniai anchomaloī*) and leads us to believe that the vote sided with Diodotus only by chance.

This random outcome is comparable to that of the sea-battle at Syracuse, where “as long as the fighting was nearly equal [*anchomala*], altogether was heard, lamenting and cries, “we conquer”, “we are beaten”.”<sup>803</sup> Thucydides tells us that the soldiers could not see that the sea-battle was in fact equally balanced. At Syracuse the polarised perspective revealed the balance in the battle, while at Mytilene it was the polarised speeches that determined the balance in the assembly’s decision. In the former, the opposition reveals the outcome, whereas in the latter the opposition determines the outcome. Logically in retrospect, a mechanism that reveals a particular outcome can be used to determine an outcome. The Syracusans used this to their advantage. It would seem that in Thucydides’ self-contained narrative, the Athenian assembly’s collective decision is balanced/ fair/ correct given the feasible choices: the actual outcome demonstrates that both proposals were in fact equally valid.

For the study of game theory, Thucydides’ description adds to the literature on the question of the “meaninglessness” of human choices, as Brams puts it. Thucydides goes further and does not stop at historical philosophy and

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<sup>801</sup> Brams (1994) 61 and Chapter 2 for “the anticipation problem”.

<sup>802</sup> Mikrogiannakis (2006) 41, 46-48.

<sup>803</sup> 7.70.4.

gives us more. He gives us drama and brings the flip of the coin of the assembly to the doorstep of Mytilene. Paches might as well have flipped a coin himself. The chance wind (*pneuma*)<sup>804</sup> that sped the second ship is compared to the unpredictability of the choice made by the Athenian assembly. Of course the wind and the imminent peril are meant to heighten the emotion of the episode, but thankfully they leave behind telltale signs of Thucydides' views on the decision making process of the assembly.<sup>805</sup>

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<sup>804</sup> Harmgart, Huck and Muller (2007), the “wind” is Thucydides’ equivalent of a “miracle”.

<sup>805</sup> Thucydides sometimes intervenes with a “dramatic” articulation of history. For Thucydides vis-à-vis Athenian Tragedy, see Cornford “Thucydides Mythistoricus” and Finley, as values that carry through from the archaic Greek world. For Thucydides’ view on natural phenomena as possibly correlated to the upheavals of war see Dewald (2005) 30-31, and Marinatos (1981) 24, *passim*; on chance and intelligence, *tyche/gnome*, see Edmunds (1975).

## Conclusion

We now reach the end of this introduction to game theory through Thucydides. I hope to have shown that Thucydidean scholarship has always intuitively discussed Thucydides' qualities as a strategic thinker who imputed motivation from the observed actions of historical agents. There are some critical differences between Thucydides and standard game theory, in that game theory is decidedly more fair, whereas Thucydides eschews the abstract fairness of standard game theory, his theory is more firmly embedded in a text that recognizes the granular awkwardness of life. Aware of the difficulties of recording simultaneity in text, Thucydides developed or observed different modes of simultaneity linked to sight. Whereas game theory research tends to generalise by associating simultaneity with all players receiving information together about one another, Thucydides frames simultaneous moves with players who see one another (e.g. first invasion of Attica) or with multiple spectator focalizations (e.g. the sea-battle in the great harbor of Syracuse) to describe an outcome that is revealed to players simultaneously. Games or strategic interactions are sometimes overlapping and linked together to form a complex web of strategic analysis to explain an outcome (e.g. Wall/ Counter-wall). When interaction is dynamic, Thucydides shifts types of actions from words (e.g. negotiations) to physical action (e.g. fighting/ building). He shifts types of context from long sequences to short sequences to repeated simultaneity to one-shot simultaneity. He is interested in how similar interactions with similar outcomes are caused by different causal processes (e.g. bargaining failures occur when (1) at least one player follows the strategy of brinkmanship and (2) two risk-loving players negotiate) and that a similar or identical starting point can lead to radically different outcomes (e.g sea-battle). He shifts types of pace from the long processes of negotiation to the more rapid interactions of a developing situation on a battlefield. All the while, players dip in and out of rational behavior, often during a game.

Thucydides is the inventor of a uniquely fashioned form of describing strategic thinking, interaction and outcome.

The episodes surveyed in this thesis were chosen so that game theory could cast its light over all eight books of the *History*. Considerations of time prevented me from including and developing more instances, but more could usefully be done in this area. Two topics that were touched upon yet not thoroughly discussed were risk behaviour and economics. These topics are of course intricately intertwined with game theory in its modern incarnation, however I believe they deserve to be discussed at length in a separate work.<sup>806</sup> It would also be interesting to apply the same hermeneutic analysis of the game theoretic method to Herodotus and Xenophon in the context of war in the *Histories* and in the *Hellenica* or campaign in the *Anabasis* and determine whether comparable underlying dynamics can be extracted from these narratives.

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<sup>806</sup> As a first step towards that, together with Roel Koneijnendijk, Hans van Wees and Chris Carey I am organising a conference in April, 2016 entitled *War in the Ancient World: The Economic Perspective*, wherein these topics among others will be more fully explored. Confirmed speakers include: Robin Osborne, Lisa Kallet, Alan Bowman, Paul Erdkamp, Matthew Trundle, Edward Harris, Zosia Archibald, John Davies, Michael Crawford, Christopher Tuplin and David Pritchard.

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## **Appendix**