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Killing dingoes is unethical, irresponsible and un-Australian, therefore stop it. The use of enthymeme in the petitions on endangered species sent to the Parliament of Australia

Abstract: The present paper analyses the use of enthymeme in the petitions sent to the Parliament of Australia. The study was suggested by the fact that petitions, being supposed to be relatively short in size, present their argument in a concise manner, leaving apart what is supposed to be already shared by the petitioners and the addressees, i.e. the Members of Parliament. The result is often the occurrence of enthymemes, i.e. of syllogisms that leave out either one of the premises or the conclusion. The analysis is carried out on a corpus of petitions on the endangered species and the approach is done from the perspective offered by classical Logic. The thirty six petitions on the topic of Endangered species listed on the website of the Parliament of Australia are summed up as enthymemes. For each enthymeme the missing part that separates it from a full syllogism was identified. The corresponding full syllogism will be analysed, to identify its form as well as its three terms. The results of the study revealed regular features such as the fact that the missing premise is in all cases the Major Premise, or the prevalence of enthymemes corresponding to syllogisms in the BARBARA Figure. The occurrence of such common features is quite unexpected as long as the petitions are written by different authors. A plausible explanation could be the fact that the common topic of these petitions, i.e. 'Endangered species', is a recurring subject of much debate in Australia, which makes people assume that people are familiar with the problems related to it as well as with the principles to be respected in order to prevent the worsening of the Endangered species problem..

Keywords: logic, syllogism, enthymeme, corpus linguistics, petition, parliament, endangered species.

1. Introduction

The notions of ‘syllogism’ and the notion of ‘enthymeme’ were introduced by Aristotle in his corpus of books on Logic and Argumentation known as the *Organon*. Syllogism is defined and analysed extensively in the book *Prior Analytic*. Aristotle defined ‘enthymeme’ as a rhetorical device where one of the premise is left out in order to persuade the audience, a goal which makes the enthymeme prone to sophistic and to logical fallacy:

- (1) By the enthymeme, Aristotle meant what has been called the “rhetorical syllogism” as opposed to the apodeictic, demonstrative, theoretical syllogism. ... An *enthymeme* is now usually defined as a syllogism incompletely stated, one of the premisses or the conclusion being understood but not expressed (Keynes 1900, 367-368).

However, later on, classical logic gave the enthymeme a definition confined to purely logical notions by regarding it as one of the incomplete types of syllogism. Syllogism is meant to be a general representation for ‘mediate inference’ (Jevons 1888/2010, 126), where two propositions (the premises) linked by a common term (‘the Middle Term’) lead to a new proposition (the conclusion). However, syllogism is not commonly used in everyday argumentation, and even university courses make seldom use of it, as stated in (2).

- (2) It may seem surprising that arguments which are met with in books or conversation are seldom or never thrown into the form of regular syllogisms. Even if a complete syllogism be sometimes met with, it is generally employed in mere affectation of logical precision. In former centuries it was, indeed, the practice for all students at the Universities to take part in public disputations, during which elaborate syllogistic arguments were put forward by one side and confuted by precise syllogisms on the other side. This practice has not been very long discontinued at the University of Oxford, and is said to be still maintained in some continental Universities; but except in such school disputations it must be allowed that perfectly formal syllogisms are seldom employed (Jevons 1888/2010, 152).

More commonly is used the enthymeme, which is an ‘incompletely expressed syllogism’ (Jevons 1888/2010, 153-154, Keynes

1900, 367-368, Eaton 1931, 117), more exactly a categorical syllogism with one of its propositions unexpressed. Syllogistic reasoning in ordinary conversation most often takes this form (Brennan 1961, 75-76).

2. Previous research

Whereas a large amount of research has been done on the notion of ‘enthymeme’, as well as the notion of ‘syllogism’, which the former is derived from, there is no significant research on the debates in the Parliament of Australia and the less so on the petitions it received from Australians. Works on enthymeme have analysed topics such as the relation between the Aristotelian notions of ‘topos’ and ‘enthymeme’ (Dyck 2002), enthymeme as a link between Logic, Rhetoric, and Metaphysics (Madden 1952), the use of enthymeme in modern discourse (Walker 1994), the role of enthymeme in common knowledge and inference (Walton 2001) or in argumentation (Walton 2007, Walton & Reed 2005).

This suggests that the present study should start from the notions of ‘enthymeme’ and ‘syllogism’ as they appear in Classical Logic, developed from Aristotle’s works on Logic. These notions are explained in detail in the works written by logicians such as John Neville Keynes, university lecturer in Moral Sciences (University of Cambridge), Cecil Alec Mace (University of London and University of St. Andrews), William Stanley Jevons (Owens College, Manchester), Joseph Gerard Brennan (Columbia University) and University Professor Alexandru Valeriu. The notions of ‘enthymeme’ and ‘syllogism’, together with those notions that are closely connected to them will make up the theoretical framework used to analyse the occurrences of enthymeme in the petitions sent to the Parliament of Australia.

3. The Parliament of Australia

The Parliament of Australia was also developed after the model of the British Parliament. It is a bicameral parliament made up of the House of Representatives and the Senate. The disposition of the members is confrontational, similar to the British Parliament and to other parliaments inspired by the latter. The citizens’ right to petition the Parliament is also a tradition inherited from the British Parliament. According to its website (<https://www.aph.gov.au/>), “[t]he right to petition Federal Parliament has

been one of the rights of citizens since federation, and it is the only way an individual can directly place grievances before the Parliament.”

In the Australian Parliament, petitions can be sent either to the House of Representatives or to the Senate. Whereas petitions have been traditionally sent in paper form, nowadays it is possible to be sent in electronic form via the website of the Parliament of Australia.

3.1 Petitions sent to the Parliament of Australia

According to the website of the Parliament of Australia, a petition sent to the Parliament should include two parts: the ‘Petition Reason’ and the ‘Petition Request (for action)’. As it is customary with petitions sent to the parliaments of other countries is general and to the British Parliament particularly, there rules also govern the language used in the petition text: “Good language”, i.e. moderate, not rude, not promoting something illegal, not mentioning acts of violence, not mentioning person names, not saying bad things about the British sovereign (who is also the head of state of Australia), about the Governor-General, the judiciary, the Members of Parliament and the Senators. Concerning the size of a petition, the two parts — the ‘Petition Reason’ and the ‘Petition Request’ — should not contain more than 250 words. The spelling and the grammar used of the petition text is not checked, which means that if mistakes exists they will remain unchanged in the text submitted to the Parliament. A petition cannot include links to websites. A petition must be written in English and addressed to the House of Representatives. Last but not least, a Member of Parliament cannot create or sign a petition.

3.2 Petitions on endangered species

The nature of Australia includes unique species of plants and animals. Unfortunately, some of them are endangered. Most Australians respect nature and many of them address the Parliament of Australia asking the Members of Parliament to take steps in order to protect plants and animals. A number of 36 petitions in electronic form (also known as ‘e-petitions’) have been sent between 16 October 2016 and 17 April 2024 calling the Parliament of Australia to take action on preventing the extinctions of such species. One of the petitions (EN3952) ironically requests “Take the kangaroo off Australia’s coat of arms” (as long as some regard it as a “pest” and hunt it). Most of the petitions mention names of endangered species — only 11 of the 36 petitions do not

mention explicit names but refer to such species in general. The list of the petitions as well as the text of each petition and the endangered species that are mentioned are displayed at the Internet address https://mihai.se/cercetare/petitii_Australia_enthymeme/texte/ . For convenience, the list of the name and date of the petitions, as well as the names of the endangered species mentioned in each petition is given in the Appendix 1 of the present study.

4. Theoretical framework

The theoretical framework of the present study will be offered by Classical Logic, which, in its turn, is founded on the Aristotelian logic. Logic is “not only an exact science, but is the most simple and elementary of all sciences” (Jevons 1888/2010, vi). Eaton (1931) makes a parallel between mental actions and the topics of Logic:

- (3) The Aristotelian tradition divides logic into three parts, the study of *conception*, *judgment*, and *reasoning*. Translated into language that is less colored by psychology, this division corresponds to the doctrine of *terms*, *propositions*, and *syllogisms* (Eaton 1931, 71).

A notion closely related to the notion of ‘judgment’ is ‘inference’, defined as “passing in a certain way from one judgment to another” (Mace 1933, ix), or as “any passing from knowledge to new knowledge” (Brennan 1961, 1).

The notion of ‘reasoning’ refers to the “activity by which our mind forms one judgment from a number of others” (Eaton 1931, 72). As mentioned in the Introduction, enthymeme is defined as an ‘imperfect form’ of syllogism: a syllogism where one of its three parts is omitted. This suggests the fact that a study on the topic of enthymeme will inevitably also refer to the notion of syllogism. Syllogism refers to ‘mediate inference’, which is one type of inference (3):

- (3) Traditionally, inferences have been classified into the two classes ‘immediate’ and ‘mediate’. An immediate inference is one which it is possible to draw from a given proposition alone; a mediate inference is one drawn from a given proposition through the mediation of some other proposition or propositions (Mace 1933, 111).

Immediate inference is performed at proposition level by making certain formal alterations in the structure of two-term propositions. Such inferences are: Conversion, Obversion, Partial Contraposition, Full Contraposition, Obverting the Converse (Brennan 1961, 36-39).

The relation between ‘syllogism’ and ‘enthymeme’ is explained in (4) and (5):

- (4) **SYLLOGISM** is the common name for Mediate Inference, or inference by a medium or middle term, and is to be distinguished from the process of Immediate Inference, or inference which is performed without the use of any third or middle term (Jevons 1888/2010, 126).
- (5) An enthymeme is a categorical syllogism with one of its propositions unexpressed. Syllogistic reasoning in ordinary conversation most often takes this form. Enthymemes are said to be of the *first order* when the *major* premise is not expressed ... In enthymemes of the *second order*, the *minor* premise is not expressed. ... In third-order enthymemes, the conclusion is not expressed (Brennan 1961, 75-76).

One of the basic notions of Logic is ‘proposition’, defined by Brennan as in (6):

- (6) By ‘proposition’ is meant (roughly) a declarative sentence, or *statement* (Brennan 1961, 13).

Propositions may be ‘simple’ or ‘compound’. Compound propositions may be ‘conjunctive’, conditional (also called ‘hypothetical’ or ‘implicative’) or ‘disjunctive’ (also called ‘alternative’) (Brennan 1961, 13-14). Jevons (1888/2010) identifies several types of propositions, such as ‘exclusive’, which limit the predicate to the subject, using words such as *only, alone, none, but*, ‘exceptive’, which “affirm a predicate of all the subject with the exception of certain defined cases”, ‘explicative’, which “affirm of their subject a predicate which is known to belong to it by all who can define the subject” (1888/2010, 68), ‘ampliative’, which join a new predicate to the subject, as in “London, the capital of England, is the largest city in Europe” and ‘tautologous’ which merely affirm the subject of itself, and give no information whatever; as in, “whatever is, is;” “what I have written, I have written”(1888/2010, 69).

Other features assigned to propositions in Classical Logic are ‘quantity’ (i.e. the “degree of generality”) and ‘quality’ (*affirmative* or *negative*) (Eaton 1931, 75-76).

Aristotelian logic “assumes that every proposition has two terms, and only two, a *subject* and a *predicate*.” (Eaton 1931, 71). The ‘subject’ is “ what the proposition is talking about” and the ‘predicate’ is “ what said about the referent of the subject term” (Brennan 1961, 14). The act of judgment “affirms or denies a predicate of a subject” (Eaton 1931, 71).

The definitions of syllogism given by the Concise Oxford English Dictionary and by Webster’s Encyclopedic Unabridged Dictionary are cited in Appendix 2. Jevons (1888/2010) describes ‘syllogism’ as in (7) and (8):

- (7) The name Syllogism means the joining together in thought of two propositions, and is derived from the Greek words (*σύν*, with, and *λόγος*, thought or reason. It is thus exactly the equivalent of the word Computation, which means thinking together (Latin *con*, together, *puto*, to think), or reckoning. In a syllogism we so unite in thought two **premises**, or propositions put forward, that we are enabled to draw from them or infer, by means of the middle term they contain, a third proposition called the **conclusion**. Syllogism may thus be defined as the act of thought by which from two given propositions we proceed to a third proposition, the truth of which necessarily follows from the truth of these given propositions. When the argument is fully expressed in language it is usual to call it concretely a syllogism (Jevons 1888/2010, 127).
- (8) The **major term** is always the predicate of the conclusion, and the **minor term** the subject (Jevons 1888/2010, 128).

Classical logicians have formulated rules that a syllogism must follow in order to be a valid form of inference. These rules “are founded upon the Laws of Thought and the Canons” (Jevons 1888/2010, 127) of Classical Logic, such as the axiom known as ‘the dictum *de omni et nullo*’, defined in *La logique de Port-Royal* (1662/1878) and derived from certain passages in Aristotle. (Eaton 1931, 86): “What is true of the universal (or class) is true of the particular (or subclass)”. Its negative corollary: “What is untrue of the universal is untrue of the particular” (Brennan 1961, 70).

Two key notions describing a syllogism are its ‘mood’ and ‘figure’. The ‘mood’ — from “Latin *modus*, shape” (Jevons 1888/2010, 136) — is “the particular combination of propositions that make it up” (Brennan 1961, 54), i.e. (i) universal or particular, (ii) affirmative or negative. The ‘figure’ means “the position of the terms in the premisses” (Keynes 1900, 309), especially “the *position of the middle term* in the premisses of the syllogism” (Brennan 1961, 55)

Accordingly, there are four figures of the syllogism:

- (9) *Figure I.*, in which the middle term is subject in the major premise and predicate in the minor premise.
Figure II., in which the middle term is predicate in both premisses.
Figure III., in which the middle term is subject in both premisses.
Figure IV., in which the middle term is predicate in the major premise and subject in the minor premise (Mace 1933, 126).
- (10) Whether the so-called fourth figure (IV above) is distinct from the first (I) is questioned, since both are cases in which the middle term is subject of one premise and predicate of another ... (Eaton 1931, 81-82).

As Brennan (1961) points out, after having been tested against the rules of the syllogisms, only 24 valid moods of syllogism — out of the 64 possible combinations — have been found to be valid:

Table 1. The valid moods of the syllogism

1 st Figure	2 nd Figure	3 rd Figure	4 th Figure
AAA	EAE	AAI	EIO
EAE	AEE	AII	AAI
AII	EIO	IAI	AEE
EIO	AOO	EIO	EAO
		EAO	IAI
(AAI)	(EAO)	OAo	
(EAO)	(AEO)		(AEO)

The five syllogisms in parentheses have “weakened conclusions”. The four syllogisms in bold face, as well as those with weakened

conclusions, have *strengthened premises* (Brennan 1961, 56, Jevons 1888/2010, 140)

The valid moods of the syllogisms, except for those with weakened conclusion and with strengthened premises, have mnemonic names given by medieval logicians. In each name the vowels stand for the mood and the consonants of the Figures 2, 3 and 4 for the immediate inferences which should be made in order to reduce the syllogism to a first-figure form:

Table 2. The mnemonics of the valid moods of the syllogism

1 st Figure	2 nd Figure	3 rd Figure	4 th Figure
BARBARA	CESARE	DARAPTI	FRESISON
CELARENT	CAMESTRES	DATISI	BRAMANTIP
DARII	FESTINO	DISAMIS	CAMENES
FERIO	BAROCO	FERISON	FESAPO
		FELAPTON	DIMARIS
(AAI)	(EAO)	BOCARDO	
(EAO)	(AEO)		(AEO)

(Brennan 1961, 58).

As Mace (1933) remarks, “[t]hese names served as a [m]nemonic device both for indicating the constitution of the moods and for indicating how moods in figures other than the first could be reduced to the first (1933, 127).

The first figure is considered a perfect figure because it fulfils the dictum *de omni et nullo* (Eaton 1931, 90)

In addition to the categorical form, there are other forms in which syllogism can be expressed: hypothetical or implicative syllogisms, alternative and disjunctive syllogisms. Besides, there are irregular forms of syllogism, one of which is the enthymeme. The noun ‘enthymeme’ originates in the Greek phrase *εν θύμηνειν*, which means “to persist in one’s mind” (Valeriu 1947/2003, 105, my translation). Two dictionary definitions of the enthymeme are cited in Appendix 2. Brennan (1961) and Jevons (1888/2010) define and classify the enthymeme as follows:

- (11) An enthymeme is a categorical syllogism with one of its propositions unexpressed. Syllogistic reasoning in ordinary conversation most often takes this form. Enthymemes are said to be of the *first order* when the *major* premise is not expressed ... In enthymemes of the *second order*, the *minor* premise is not expressed. ... In third-order enthymemes, the conclusion is not expressed (Brennan 1961, 75-76).
- (12) A syllogism when incompletely stated is usually called an **enthymeme**, and this name is often supposed to be derived from two Greek words (*ἐν* in, and *θυμός*, *mind*), so as to signify that some knowledge is held by the mind and is supplied in the form of a *tacit*, that is a silent or understood premise. Most commonly this will be the major premise, and then the enthymeme may be said to be of the First Order. Less commonly the minor premise is unexpressed, and the enthymeme is of the Second Order. ... It may happen occasionally that the conclusion of a syllogism is left unexpressed, and the enthymeme may then be said to belong to the Third Order (Jevons 1888/2010, 153-154).

This “common knowledge” that is “held by the mind” is presumably what the *Port Royal Logic* points out to be a syllogism “in mind”:

- (13) “The two premises are not, to be sure, always expressed; a single one is often sufficient to cause us to think of the two; and when we thus explicitly formulate only two propositions (a premise and a conclusion), this sort of argument is called an *enthymeme*. But this is a true syllogism in thought since our mind supplies the proposition that is not expressed, even though the argument is defective in its expression and yields a conclusion only by virtue of this proposition which is tacitly present.”

(*The Port Royal Logic*, quoted by Eaton 1931, 93-94)

The fact highlighted in (13) above, that enthymeme is actually “a true syllogism (in thought)”, is noteworthy and to be kept in mind during the analysis to be conducted on the corpus of petitions. It warrants the fact that any analysis of enthymemes is (actually) an analysis of syllogisms.

5. Material and method

The present study will use the Corpus Analysis methodology in order to identify the enthymeme that can be an alternative form of each petition and then to identify the syllogism that can represent a complete

form of the respective enthymeme. Further on, the main parts of the syllogism will be identified, i.e. the Major Premise, the Minor Premise and the Conclusion, as well as the Major Term, the Minor Term and the Middle Term. The results of this analysis will enable a description of the petitions in form of an enthymeme together with its corresponding syllogism .

5.1 The corpus of petitions

As mentioned, endangered species makes up the subject of 36 petitions sent to the Parliament of Australia from October 2016 to April 2024. The corpus consists of 36 petitions on endangered species of plants or animals. These are all the petitions on this topic that are available on the website of the Parliament of Australia. It is a corpus of 8,000 words, which means that the size of the corpus is relatively small. However, its topic is highly specialised, as it includes petitions on one topic only. Table 3 below sums up the main features of the corpus.

Table 3. The corpus of petitions used in the present study

Number of petitions	36
Topic	Endangered species
Total number of words	8,000
Average size of a petition	223 words
Longest petition	PN0011 (284 words)
Shortest petition	EN2059 (78 words)

One may notice the fact that the longest petition exceeds the limit of 250 words prescribed by the rules that govern the writing and submission of a petition, mentioned in section 3.1 above. This is actually the case with no less than 17 petitions on the topic ‘Endangered species’, which also exceeds this limit. This suggests that this limit is recommended rather than imposed.

A final remark on the corpus is that the text of the petitions include a few language mistakes. Thus, the possessive pronoun in the third person singular for the neutral gender appears in a few cases in the

form *it's* instead of the correct form *its*. This is, nevertheless, not surprising, as long as one of the rules governing the procedure of petitioning the Parliament of Australia is that the spelling of the text of the petition is not checked and the petitions are, accordingly, presented to the Parliament in the exact form in which they have been written.

5.2 Working hypotheses

The fact that enthymeme rather than full syllogism is more present in ordinary argumentation, together with the fact that the style of the petitions sent to the Parliament of Australia is expected to be plain rather than formal, suggests that enthymeme is expected to be frequently employed in the argumentative structure of the petitions. In other words, enthymeme rather than full syllogism is expected to be a concise version of the petition. The results of the present study are expected to point out to what extent the enthymeme may be regarded as an argumentative structure for a petition.

5.3 The method of analysis

As mentioned in the Theoretical Framework section, enthymeme rather than pure syllogism is met in everyday argumentation. As long as petitions to the Parliament of Australia are written by ordinary Australian citizens whose style is ordinary rather than formal, one may expect the occurrence of enthymeme in their argumentation.

And indeed, a look at several petitions confirms that this is the case. According to the rules governing the procedure of petitioning, any petition sent to the Parliament of Australia must have a standard form consisting of two parts: the 'Petition Reason' and the 'Petition Request', in this order. This very structure reminds of the structure of an enthymeme, which, as mentioned in the Theoretical Framework section, consists of two expressed parts, as long as an enthymeme is a syllogism whose one part (one of the premises or even the conclusion) is not mentioned explicitly. This prompts the idea of representing each petition in the form of an enthymeme, together with a full syllogism made up of the enthymeme and its missing part.

The fact that an enthymeme is a syllogism that lacks one of the premises or its conclusion suggests that the next step of the analysis should be to identify the missing part that differentiates the enthymeme from a complete syllogism, and thus to identify a syllogism that could be

regarded as a complete version of the respective enthymeme. This syllogism will be analysed starting from the above-mentioned theoretical framework. First, it will be expressed as a syllogism in the form of the First Figure. The steps to be followed are listed in Table 4.

Table 4 . The steps to be followed in analysing a petition

Step	Analysis
1	Identify the enthymeme that may sum up the content of the petition.
2	Identify a possible form of the missing part of the enthymeme.
3	Express the full syllogism corresponding to the enthymeme.
4	If the syllogism is not in the First Figure, reduce it to a First-Figure form.
5	Identify the Major Premise, the Minor Premise and the Conclusion of the syllogism.
6	Identify the three terms of the syllogism.
7	Identify the subject and the predicate of each of the three premises of the syllogism.
8	Identify the mood of the syllogism and its mnemonic.
9	Calculate the frequency of those features which are relevant to the present study.
10	Interpret the values of the frequency.

The frequency will be expressed in the statistical format, with the percentage expressed as a value between 0 and 1. A frequency of 24%, for instance, will be expressed as .24 and a frequency of 100% will be expressed as 1.

Let us exemplify the analysis of the above-mentioned features, following steps 1 –8, as steps 9 and 10 can only be done after having analysed all the petitions in the corpus. The petition chosen for this exemplification is *Petition EN1266 - Introduction of Native Animal studies and care into the curriculum*, a relatively short petition whose full text is rendered in (14):

- (14) Petition Reason
 Asking the House to add Native Flora and Fauna studies and Native

Wildlife Care to the national curriculum. Australians should have a deep knowledge of our native Flora and Fauna and have basic training to be able to care for injured wildlife. This vital knowledge will be key to saving our unique species.

Petition Request

We therefore ask the House to add Native Flora and Fauna studies and caring for injured wildlife to the Australian primary and secondary schools curriculum.

(Petition EN1266 - Introduction of Native Animal studies and care into the curriculum)

The results of the analysis are displayed in Table 5. The symbol ∴ is the ‘therefore symbol’, used in Logic to indicate a conclusion or a consequence.

Table 5 . The results of the analysis of the enthymeme corresponding to Petition EN1266

Step	Analysis	Result
1	Enthymeme	[What helps saving Australia’s unique species should be learned in schools.] Native Flora and Fauna studies and Native Wildlife Care helps saving Australia’s unique species. ∴ Native Flora and Fauna studies and Native Wildlife Care should be learned in schools.
2a	Missing part	What helps saving Australia’s unique species should be learned in schools.
2b	Missing part description	Major Premise
3	Full syllogism	All that helps saving Australia’s unique species is to be learned in schools. Native Flora and Fauna studies and Native Wildlife Care helps saving Australia’s unique species.

		∴ Native Flora and Fauna studies and Native Wildlife Care are to be learned in schools.
4	Syllogism in the First Figure	(Same, as it has already been expressed in the First Figure)
5a	Major Premise	All that helps saving Australia's unique species is to be learned in schools.
5b	Minor Premise	Native Flora and Fauna studies and Native Wildlife Care helps saving Australia's unique species.
5c	Conclusion	Native Flora and Fauna studies and Native Wildlife Care are to be learned in schools.
6a	Major term	to learn
6b	Minor term	Native Flora and Fauna studies and Native Wildlife Care
6c	Middle term	to save
7a	Major Premise subject	to save
7b	Major Premise predicate	to learn
7c	Minor Premise subject	Native Flora and Fauna studies and Native Wildlife Care
7d	Minor Premise predicate	to save
7e	Conclusion subject	Native Flora and Fauna studies and Native Wildlife Care
7f	Conclusion predicate	to learn
8a	Syllogism mood	AAA
8b	Syllogism mnemonic	BARBARA

6. Results and discussion

The full syllogism corresponding to each enthymeme is expressed in the classical logical form of the categorical syllogism, i.e. using propositions of the A, E, I and O types, as described in the section on the

Theoretical Framework above. The analysis on the corpus revealed that this syllogism has been easily expressed directly in the First Figure and that in most cases it is the AAA mood, a syllogism whose mnemonic is BARBARA. In a few cases the First-Figure mood is EAE, which has the mnemonic CELARENT. These results are summed up in Table 6:

Table 6. The frequencies of the two type of syllogism in the First Figure occurring in the petition corpus

Syllogism mood	Occurrences	Frequency
BARBARA	33	.92
CELARENT	3	.08

It is noteworthy to point out that finding a syllogism that should correspond to an enthymeme was aimed first of all at finding a First-Figure syllogism wherever possible. This means that the First-Figure form found and displayed in the analysis is not the only form possible but it is the most convenient, in that it is the form which classical logicians regarded as perfect and which the forms in the other three figures should be reduced to. The syllogism in Table 7 corresponding to Petition EN1266, can also be expressed in the 2nd, 3rd or 4th Figure, as described in Tables 8 and 9.

Table 7. The syllogism corresponding Petition EN1266 expressed in the 2nd Figure

Major Premise	The school curriculum is to include all that helps saving Australia's unique species.
Minor Premise	Native Flora and Fauna studies and Native Wildlife Care helps saving Australia's unique species.
Conclusion	∴ The school curriculum is to include Native Flora and Fauna studies and Native Wildlife Care.

Table 8. The syllogism corresponding Petition EN1266 expressed in the 3rd Figure

Major Premise	All that helps saving Australia's unique species is to be learned in schools.
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Minor Premise	Something that helps saving Australia's unique species is Native Flora and Fauna studies and Native Wildlife Care.
Conclusion	∴ Native Flora and Fauna studies and Native Wildlife Care are to be learned in schools.

Table 9. The syllogism corresponding Petition EN1266 expressed in the 4th Figure

Major Premise	The school curriculum is to include all that helps saving Australia's unique species.
Minor Premise	Something that helps saving Australia's unique species is Native Flora and Fauna studies and Native Wildlife Care.
Conclusion	∴ The school curriculum is to include Native Flora and Fauna studies and Native Wildlife Care.

As long as the 1st Figure is considered to be the perfect figure of a syllogism and as long as any other figure can be reduced to a First-Figure form, the analysis on the corpus has been confined to the 1st Figure.

6.1 The three Terms of the syllogism

As mentioned, the classical syllogism includes three and only three terms: the Major, the Minor and the Middle Term, as described in the Theoretical Framework section above.

A remarkable result of the analysis is that, in all petitions, the Minor Term is a Singular Term. Concerning Singular Terms, Eaton (1931) remarks that, from a logical point of view, they may be regarded as universal ones:

- (15) Singular terms, i. e., those that refer to individuals, do not differ from universal ones so far as distribution goes. They are used in their widest possible generality, to designate one individual; they constitute special cases whose generality could neither be restricted nor more widely extended, since it is already definite (Eaton 1931, 92).

This means that the propositions in the enthymeme and its corresponding syllogism that include singular terms can be expressed as universal ones.

Let us analyse the frequency and content of each of the three terms of the full syllogism associated with each enthymeme. The analysis on the corpus identified the English words that express each of the three terms and their frequency. This section will highlight the most frequent ones, as well as semantic features which are relevant in describing the part played by the three terms in the meaning of the petitions.

The most frequent Major Terms are listed in Table 10 together with their frequencies.

Table 10 . The most frequent Major Terms

Major Term	Frequency
to ban, to implement	.17
to protect	.09
to build, to endorse	.06

The predicates *to ban* and *to implement* have exactly the same frequency, .17, corresponding to 6 occurrences each. They may be considered semantically complementary in that the petitioners ask that a measure regarded as necessary should be implemented or an action regarded as harmful should be banned.

A closer look at the English words expressing the Major Term in the petitions analysed reveals the positive or negative feature of their meaning, in that they may express a constructive action or to cancel an action. This is displayed in Table 11 .

Table 11 . The words expressing the Major Term and their positive / negative semantic feature

Major Term	Feature	Frequency
to approve, to build, to enact, to endorse, to establish, to follow, to implement, to learn, to protect, to save, to support, necessary	positive	.56
to ban, to cease, to counteract, to halt, to inquiry, to refuse, to reject, to remove, to stop	negative	.39
to declare	neutral	.03

One may notice that the positive semantic features are more frequent than the negative ones. Given the fact that the Major Term is the predicate of the Major Premise of the syllogism in the BARBARA Figure, this suggests that the petition in most cases asserts the fact that something should be done. However, three of the syllogisms are in the CELARENT Figure, where the Major Premise is negative. A direct look at them reveals the fact that the three predicates which are in negative form, i.e. negated, are *to build*, *to build* and *to approve* — in other words, *not to build* and *not to approve*. This diminishes the gap between the positive and negative terms, but the difference is still greatly in favour of the former.

Moreover, concerning the three syllogisms CELARENT Figure, which belongs to the EAE mood, have their conclusion, just like their Major Premise, expressed by a universal negative proposition. This, in its turn, means that they can be rephrased as syllogisms in the BARBARA Figure by replacing the verbs that predicate with a word whose meaning is the opposite. In the context of each of the three petitions the negated verbs *to build* and *to approve* can be replaced with the verb *to turn down* in its affirmative form. Thus, the syllogism in the CELARENT Figure corresponding to Petition EN2046 can be rephrased in the BARBARA Figure, as rendered in (16a) and (16b) respectively:

(16a) All facilities that harm nature and aboriginal places are not to be built.

The gas plant and terminal harm nature and aboriginal places.

∴ The gas plant and terminal are not to be built.

(16b) All facilities that harm nature and aboriginal places are to be turned down.

The gas plant and terminal harm nature and aboriginal places.

∴ The gas plant and terminal are to be turned down.

Conversely, the syllogism in the BARBARA Figure corresponding to Petition EN5918, whose corresponding enthymeme is paraphrased in the title of the present study, can be illustratively rephrased as one in the CELARENT Figure, as described in (17a) and (17b):

(17a) All that is unethical, irresponsible and un-Australian is to be stopped.

Killing dingoes is unethical, irresponsible and un-Australian.

∴ Killing dingoes is to be stopped.

- (17b) All that is unethical, irresponsible and un-Australian is not to be allowed any longer.
 Killing dingoes is unethical, irresponsible and un-Australian.
 \therefore Killing dingoes is not to be allowed any longer.

However, as long as the results of the analysis must be as close to the original text as possible, such a rephrasing will not be done in the process of analysis on the corpus. The only rephrasing which is useful is, as mentioned, the reduction of the syllogisms in the 2nd, 3rd and 4th Figure to 1st Figure syllogisms, which in Classical Logic is regarded as the perfect Figure.

As stated at the beginning of section 6.1, the analysis on the corpus revealed that the Minor Term is always expressed by a singular term. In other words, is is not quantified with either if the quantifiers “all” or “some”, but as a noun either proper — such as “Myrtle Rust disease” (EN0686) or “Graeme Samuel’s EPBC Act reform” (EN1839), or the name of a species — such as “kangaroo” (EN3952), “flying-fox” (EN1714) or “Baw Baw Frog” (EN4441), or in the definite form — such as “this project” (PN0068), or generic — as “pharmaceutical waste” (EN0628) or “coal mines and fossil fuels” (EN0840). This Singular Terms occur only once, which means that there is no difference in their frequency. As for the Middle Term, the frequencies and content are displayed in Tables 12 and 13 respectively.

Table 12 . The most frequent Middle Terms

Middle Term	Frequency
endangered / to endanger	.2
to protect	.11
to harm, to prevent	.08
Dangerous	.06

The data in Table 13 represent the positive / negative semantic feature of the English words that are expressing the Middle Term.

Table 13 . The words expressing the Middle Term and their positive / negative semantic feature

Middle Term	Feature	Frequency
benefic, endangered, net zero target, to	positive	.5

prevent, to protect, to rectify, to reduce (climate change), to rejuvenate, to reverse, to save		
to damage, dangerous, to destroy, detrimental, to endanger, to harm, harmful, irresponsible, pest, prejudicial, unecological, unethical, un-Australian	negative	.5
to standardise	neutral	.03

A remarkable result is that the frequencies of the positive and negative meaning of the Middle Term are equal. A comprehensive look at the tables that display the analysis results for the three terms leads to the immediate conclusion that the Major Term and the Middle Term are often expressed by verbs, whereas the Minor Term, as mentioned, is expressed by Singular Terms.

As mentioned in the analysis of the Major Term, three of the syllogisms are in the CELARENT Figure, where the Major Premise is negative. However, unlike the Major Term, which is negated in the Major Premise, in the Figure the Middle Term is the subject of the Major Premise and the predicate of the Minor Premise, which is the Universal Affirmative. This means that the Middle Term is not negated. A look at these three cases reveals that the Middle Term is expressed by the words *to damage*, *to endanger* and *to harm*. These cases are already mentioned in Table 13, so they do not alter the result expressed in that table.

6.2 The trinomial (Major Term, Minor Term, Middle Term)

As long as a syllogism has three and only three terms, a trinomial (i.e. ordered group of three terms) made up of these terms may be assigned to any syllogism. As mentioned in the section on the most frequent words expressing the three Terms, the Minor Term is expressed by Singular Terms, but some of the words expressing the Major Term and the Middle Term are more frequent than the rest. This means that the frequency of the trinomial made up of the three terms is given by the frequency of the Major Term and the Middle Term. The investigation on the corpus revealed the most frequent trinomials displayed in Table 14 :

Table 14 . The most frequent trinomials (Major Term, Minor Term, Middle Term)

(Major Term, Minor Term, Middle Term)	Frequency
(to protect, <i>Singular Term</i> , endangered)	.08
(to ban, <i>Singular Term</i> , dangerous)	.06
(to ban, <i>Singular Term</i> , to harm)	
(to refuse/reject, <i>Singular Term</i> , unecological project)	
(to implement, <i>Singular Term</i> , to prevent)	
(to implement, <i>Singular Term</i> , to prevent)	

One may remark the semantic similarity between the Major Term and the Middle Term, in that the petitions request the protection of what is endangered, the implementation of a preventive measure or banning what is dangerous/harmful and refusing/rejecting what is unecological. In other words, that the trinomial description confirms what was suggested by the analysis of the most frequent words that are expressing the Major Term and the Middle Term.

7. Conclusions

The results of the investigation performed in the present study confirms the working hypothesis stated in section 5.2, that the petitions sent to the Parliament of Australia on the topic ‘Endangered species’ have an argumentative structure which can be summed up as the classical logical enthymeme.

Figures 1a and 1b sum up the structure of the enthymemes in the two Figures which have been identified during the analysis on the corpus. The pairs of words included in the curly brackets represent the most frequent subject and predicate for each premise. As mentioned in section 6, the Minor Term is expressed as a Singular Term.

Figure 1a. The structure and content of the enthymemes in the Figure BARBARA

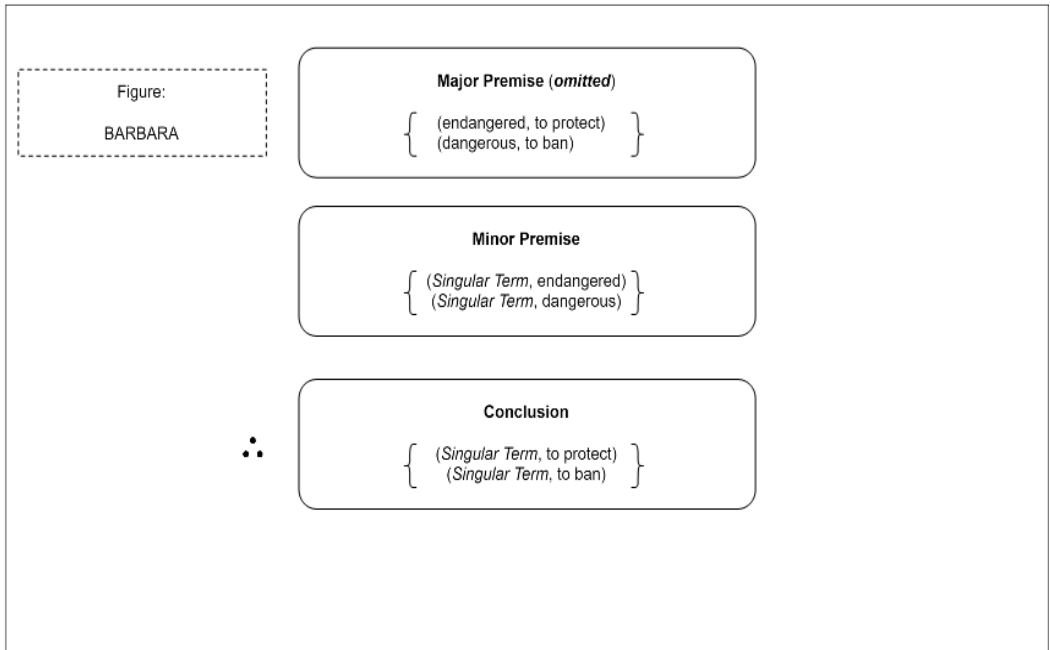
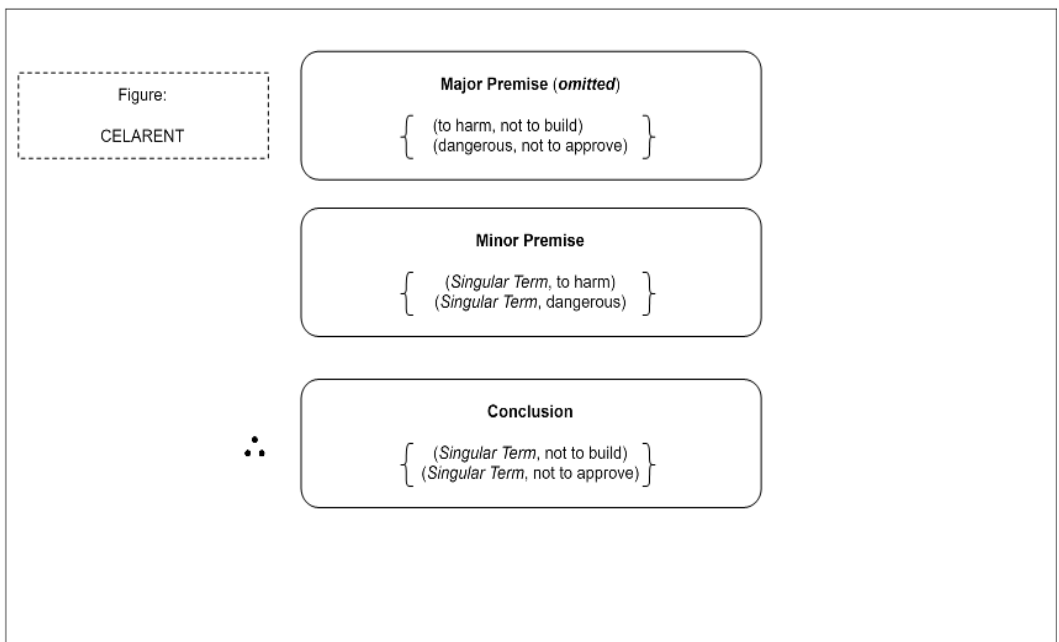
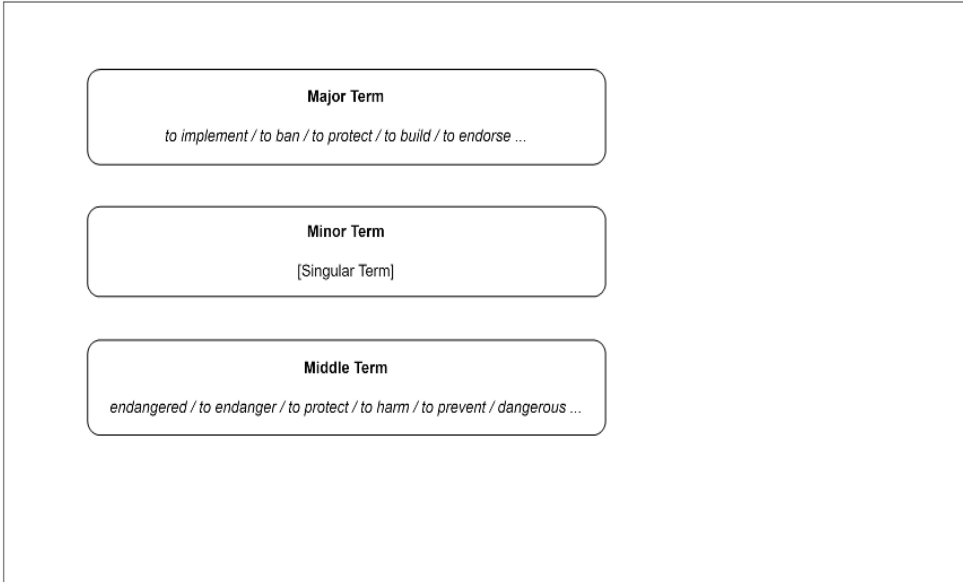


Figure 1b. The structure and content of the enthymemes in the Figure CELARENT



The structure of each of the three terms of the enthymeme is summarised in Figure 2. The words listed for each Term are those which were identified to be most frequent ones, as described in section 6 above.

Figure 2. The three terms of the enthymemes



In all enthymemes the missing part is the Major Premise, which suggests that the authors of the petitions on the topic ‘Endangered species’ assume that the Members of Parliament, and the citizens in general, already know the general situation connected with this topic, such as the danger of extinction threatening species of animals and plants, the huge danger represented by climate change and pollution, threatening both nature and human beings. The petition which inspired the title of the present study described the killing of dingoes as something that is “unethical, irresponsible and un-Australian”. Against the background of common knowledge this implies that people’s conduct should be ethical, responsible, and (of course!) Australian. In a wider context the last of the three adjectives could be rephrased as ‘patriotic’.

Finally, the fact that the enthymeme summarised the content of the petition suggests that a detailed description of each petition could be described using other argumentative structures. This could be the subject of a further study.

Appendix 1

The petitions analysed in the present study

Name	Date	Title	Endangered species
P 1	2016-10-16	Petition PN0011 - A petition from Ms Jeanette Lockey	flora and fauna species
P 2	2017-01-20	Petition PN0068 - A petition from Mr Nawal Kant Maharaj	Dugong, Turtle, threatened bird species, the Great Barrier Reef
P 3	2017-11-15	Petition EN0361 - A petition from Mr Duncan Gibbs	indigenous rainforest species
P 4	2018-03-14	Petition EN0487 - A petition from Mr Malcolm Herbert	Water Mouse, Illidge's Butterfly, Green Turtle and Dugong, fish species, migratory birds, Far Eastern Curlew
P 5	2018-07-18	Petition EN0628 - A petition from Margaret Collings	Amphipod
P 6	2018-09-19	Petition EN0686 - A petition from Mrs Maria Hitchcock	Eucalypts, Melaleucas, Tea-trees and others, hardwood forestry and many threatened species
P 7	2019-02-14	Petition EN0840 - A petition	Human beings

		from Mr Michael Leahy	and myriad other species (endangered by climate change)
P 8	2019-05-01	Petition EN0889 - A petition from Mr Aiden Dartley	the Regent Honeyeater
P 9	2019-08-28	Petition EN0933 - A petition from Mr Caleb Gorniakowski	-
P 10	2020-03-04	Petition EN1228 - Develop policy for reforestation of unproductive land	birds, mammals and reptiles
P 11	2020-03-04	Petition EN1266 - Introduction of Native Animal studies and care into the curriculum	native Flora and Fauna
P 12	2020-03-04	Petition EN1267 - Protect, Innovate and Build a Better Future for all Australians	possible extinction of certain species (victims of bushfire)
P 13	2020-03-11	Petition EN1295 - Solutions for Australia's Flora and Fauna	-
P 14	2020-03-25	Petition EN1313 - National Memorial and Museum to Extinct and Endangered Australian Species	Bramble Cays melomys
P 15	2020-09-02	Petition EN1714 - Stop the harassment of Australia's flying-fox camps	Flying-fox
P 16	2020-09-23	Petition EN1783 - Switch to paper cotton buds	Loggerhead Turtles, Seabirds, many species of Australian-caught fish
P 17	2020-11-04	Petition EN1839 - EPBC - Do not pass changes without proper	-

		consult	
P 18	2020-11-04	Petition EN1862 - Better protection for our koalas	Koala
P 19	2020-12-09	Petition EN2046 - No Gas Line or Terminus in Kurri Kurri	-
P 20	2020-12-09	Petition EN2059 - An end to Regional Forest Agreements	Old Growth Forests
P 21	2021-02-10	Petition EN2174 - Declare a Climate Emergency	Millions of species are going extinct (because of climate change)
P 22	2021-04-14	Petition EN2481 - The Marine Arctic Peace Sanctuary Treaty To Protect All Life	-
P 23	2021-06-23	Petition EN2687 - Healthy soils for a healthy future	-
P 24	2021-08-12	Petition EN2801 - Cease the use of 1080 poison	-
P 25	2021-09-22	Petition EN3135 - Accelerate Climate Change prevention measures	-
P 26	2021-09-29	Petition EN3222 - Climate Change - Reduce Greenhouse Gas Emissions by 2035	-
P 27	2022-04-06	Petition EN3952 - To Take the Kangaroo Off the Australian Coat of Arms	Kangaroo
P 28	2022-10-05	Petition EN4145 - A 10 point Plan for Nature	-
P 29	2022-10-12	Petition EN4441 - Save the Baw Baw Frog	Baw Baw frog
P 30	2023-04-05	Petition EN4826 - Parliamentary inquiry into the wind turbine industry in Australia	threatened species

P 31	2023-07-12	Petition EN5172 - The AI Environmental Crisis: Requesting a Federal AI Environment Act	habitats
P 32	2023-08-31	Petition EN5268 - Ban the introduction of the felixer grooming trap	Feral cats
P 33	2023-09-06	Petition EN5334 - Protect Port Stephens from Industrial windfarms	The Gould's petrel, Little tern, Greynurse Shark, Black Rockcod and Green turtle
P 34	2023-12-28	Petition EN5680 - A moratorium on all 'renewable energy' projects and infrastructure	-
P 35	2024-03-13	Petition EN5918 - Save our Dingoes, BAN 1080	dingo (Australian wild dog)
P 36	2024-04-17	Petition EN6031 - Legalize the Use of Myxomatosis Vaccine for Domestic Rabbits	Domestic rabbit

Appendix 2

Dictionary definitions of the notions of 'syllogism' and 'enthymeme'

syllogism

a form of reasoning in which a conclusion is drawn from two given or assumed propositions (premises); a common or middle term is present in the two premises but not in the conclusion, which may be invalid (e.g. all dogs are animals; all animals have four legs; therefore all dogs have four legs).

ORIGIN

Middle English via Old French or Latin from Greek *sullogismos*, from *sullogizesthai*, from *sun-* with + *logizesthai* 'to reason' (from *logos* 'reasoning').

(*Concise Oxford English Dictionary* 2009, 1458)

syllogism

1. Logic an argument the conclusion of which is supported by two premises, of which one (**major premise**) contains the term (**major term**) that is the predicate of the conclusion, and the other (**minor premise**) contains the term (**minor term**) that is the subject of the conclusion; common to both premises is a term (**middle term**) that is excluded from the conclusion. A typical for is “All A is B; all B is C; therefore all A is C.”
2. deductive reasoning
3. an extremely subtle, sophisticated, or deceptive argument. [< Latin syllogism(us) < Greek *syllogismós*, equivalent to *syllog-* + *-ismos* -ism; r. Middle English *silogime* < Old French]

(*Webster's Encyclopedic Unabridged Dictionary* 1994 : 1440)

enthymeme

Logic

an argument in which one premise is not explicitly stated.

ORIGIN C16 via Latin from Greek *enthymēma*, from *enthumeisthai* ‘consider’.

(*Concise Oxford English Dictionary* 2009 : 476)

enthymeme

Logic

a syllogism in which one premise is unexpressed. [< Latin *enthymema* < Greek, equivalent to *en-* (“in”) + *thym(ós)* spirit, thought + *-ēma* “-eme”]

(*Webster's Encyclopedic Unabridged Dictionary* 1994 : 476)

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