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How to give someone Horns

Paradoxes of Presupposition in Antiquity*

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Abstract

This paper discusses ancient versions of paradoxes today classified as paradoxes of presupposition and how their ancient solutions compare with contemporary ones. Sections 1–4 air ancient evidence for the Fallacy of Complex Question and suggested solutions, introduce the Horn Paradox, consider its authorship and contemporary solutions. Section 5 reconstructs the Stoic solution, suggesting the Stoics produced a Russellian-type solution based on a hidden scope ambiguity of negation. The difference to Russell's explanation of definite descriptions is that in the Horn Paradox the Stoics uncovered a hidden conjunction rather than existential sentence. Sections 6 and 7 investigate hidden ambiguities in “to have” and “to lose” and ambiguities of quantification based on substitution of indefinite plural expressions for indefinite or anaphoric pronouns, and Stoic awareness of these. Section 8 considers metaphorical readings and allusions that add further spice to the paradox.

This paper is about the ancient versions of certain paradoxes that today are commonly classified as paradoxes of presupposition.¹ In particular, it is about the Stoic treatment of such paradoxes and how it fares in comparison with contemporary suggestions for solutions. *Section 1* introduces the notion of a presupposition and airs the ancient evidence for the so-called Fallacy of Complex Question and the solutions suggested. *Section 2* introduces the Horned Man or Horn paradox and considers its authorship, attribution and ancient classification. *Section 3* introduces some contemporary suggestions how to solve paradoxes like the Horn paradox. *Section 4* uncovers a sophistic element in the Greek version of the Horn paradox which is grounded on the flexibility of word order in ancient Greek. *Section 5* provides a possible reconstruction of the Stoic solution of the Horn paradox, based on surviving evidence on Stoic logic. It suggests that the Stoics put forward a Russellian-type solution to the paradox; that is, that they held that at the base of the paradox is a hidden scope ambiguity of negation. The difference to Russell's explanation of definite descriptions is that in the Horn paradox the Stoics uncovered a hidden conjunction rather than a hidden existential sentence. The result is a

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¹ Sometimes they are called paradoxes of unwarranted presupposition, inappropriate presumption paradox (Rescher 2001, 140), illegitimate presupposition (Layman 2002, 154); and similar.

three-way, as opposed to a two-way, ambiguity. *Section 6* suggests that the Stoics may further have pointed out an ambiguity in the expressions “to have” and “to lose” hidden by the surface structure of the argument. *Section 7* investigates some ambiguities of quantification in the paradox that are based on its substitution of an indefinite plural expression for indefinite or anaphoric pronouns, and gives evidence that the Stoics may have been aware of this. *Section 8* mentions some further subtleties, such as metaphorical readings and allusions that are likely to have added further spice to the paradox.

1. The Fallacy of Complex Question

What are paradoxes of presupposition? The simplest and best known version is perhaps hardly a paradox. It consists of one sentence, usually a question, and is variously called the fallacy of the complex question, the fallacy of many questions and the loaded question fallacy (Layman 2002, 154; Walton 1999, 379). This kind of fallacy was known in antiquity. Ancient examples include:

- Have you given up committing adultery? (NA = Aulus Gellius, *Attic Nights* 16.2.4–5)
- Have you stopped beating your father? (DL = Diogenes Laertius, *Lives of the Philosophers* 2.135)²

Such questions are called “complex questions”, since they are taken to be a combination of two (or more) sentences, disguised or contracted into one.³ In themselves, these questions are neither fallacious nor paradoxical. They acquire an air of paradoxicality only when posed in contexts in which the choice of answers is restricted.⁴ It is only then that they seem to force the respondents to admit something that is unwarranted by evidence and detrimental to them.

Both our ancient sources show that the Hellenistic philosophers were aware of this fact. Diogenes Laertius reports:

Heraclides said that he (i.e. Menedemus) [...] laughed at dialectics. So that, when Alexinus once asked him whether he had stopped beating his father, his reply was: “but neither was I beating him nor have I stopped”. And again, when Alexinus told him that he should have resolved the two-sided attack by saying either “yes” or “no”,

² Contemporary examples reflect the changes of *mores*: Have you stopped beating your wife? (Layman 2002, 154); Have you stopped abusing your spouse? (Walton 1999, 383); Have you stopped sexually harassing your students? (Walton 1999, 379)

³ There is disagreement about what this complexity consists in. Some take the implicit sentence to be “have you (ever) beaten your father?”. Others would analyse “have you stopped beating your father?” as having the complex (conjunctive) meaning “did you beat your father and are you no longer beating him?”.

⁴ Sometimes the questions are not “yes/no questions”, but Wh-questions, e.g. “when did you stop beating your father?” The paradoxicality here shows itself as the choice between giving a particular date or (perhaps) to say “never”, again with the implication either way that the beating took place.

he replied “it would be ridiculous to follow your rules, given that it is possible to stop on the threshold.”⁵ (DL 2.135)

And Aulus Gellius writes:

(4) But there seem to be some cases in which you are caught (in a fallacy), if you answer what you have been asked briefly and to the point. (5) For if someone were to ask a question in the following words: “I ask you to tell me whether or not you have given up committing adultery”, then, whichever way you answer according to this rule of dialectics, whether you affirm or deny it, you will be caught in a fallacy – equally if you were to say that you are adulterous, (and if you) were to deny it.⁶ (NA 16.2.4–5)

We can assume that, put in direct speech, the fallacious questions discussed in these two passages would have been “have you stopped beating your father?” and “have (or haven’t) you given up adultery?” These are question sentences, each containing a verb of the family “to cease”. These questions are fallacious because, (i) regardless of whether you answer with “yes” or “no”, it will be implied, suggested, assumed, inferred, that you beat your father or committed adultery; and (ii) at the same time it is taken as a fact that you have not committed the act, or at least wish not to concede that you have.⁷

Already in this simple case we can observe a feature that is typical of logical paradoxes: it is only in the context of certain linguistic or logical requirements that a problem arises. If in ordinary life someone asked you “have you stopped committing adultery?”, and you never committed adultery, you would simply say: “but I’ve never committed adultery in the first place”, or something of that sort. This is the kind of response Menedemus gives.

However, in both our passages the interlocutor is assumed to take part in a kind of *logical* competition, or dialectical discourse, where there is a rule (cf. νόμος, *lex*) of verbal conduct which allows you only to answer either “yes” or “no”. This rule was widely accepted for dialectical discourse.⁸ Menedemus simply rebels against it. Still, the rule is neither arbitrary nor mere chicanery. It serves a reasonable purpose. As Gellius says just before the passage quoted

(2) In fact, what they say (i.e. that one must answer “yes” or “no”) without doubt ought to happen in most debates. (3) For a discussion will become endless and

⁵ [...] διαπαίζειν δὲ τὰ διαλεκτικά. ὥστε Ἀλεξίνου ποτὲ ἐρωτήσαντος εἰ πάπαται τὸν πατέρα τύπτων, ἄλλ’ οὐτ’ ἔτυπτον, φάναι, οὔτε πάπαμαι. πάλιν τ’ ἐκείνου λέγοντος ὡς ἐχρῆν εἰπόντα ναί ἢ οὐ λύσαι τὴν ἀμφιβουλίαν, ἔγελσιν, εἶπε, τοῖς ὑμετέροις νόμοις ἀκολουθεῖν, ἐξὸν ἐν πύλαις ἀντιβῆναι.

⁶ (4) [...] esse quaedam videntur, in quibus si breviter et ad id quod rogatus fueris respondeas, capiare. (5) Nam si quis his verbis interroget: “Postulo uti respondeas desierisne facere adulterium an non,” utrumcumque dialectica lege responderis, sive aias seu neges, haerebis in captione, tamquam si te dicas adulterum (quam si) neges.

⁷ Are these questions paradoxical? According to Rescher 2001, 6, a paradox arises “when plausible premisses entail a conclusion whose negation is also plausible” or “when a set of individually plausible propositions is collectively inconsistent”. If we add the context, we could construct a contradiction. Rescher 2001, 139–40, does so. Thus these questions are at most implicitly paradoxical.

⁸ Cf. e.g. Aristotle, *Topics* 8.2 158a14–17, 8.7 160a33–4, Aristotle, *Sophistici Elenchi* 17 175b8–14, in addition to the Gellius and Diogenes passages quoted.

inextricably complex, if it is not confined to simple questions and answers.⁹ (NA 16.2.2–3)

We can here see a methodological principle whose function is to break down complex discourse into individual sentences which are to be answered, one by one, with “yes” or “no”. The point is to collect a set of agreed premisses to which one can resort when drawing conclusions. The matter of discussion is dissected into easily comprehensible, small parts. In this way, logical mistakes can be avoided or showcased, etc. This is not so different from the requirement of contemporary logic to break up a logical argument into the smallest possible steps, in order to make sure no mistakes go undiscovered. Successful use of the methodological principle presupposes that all questions can in fact be – correctly – answered with either “yes” or “no”. In other words, something along the lines of a principle of excluded middle for all yes/no questions is presupposed.

Before we look what specific “solution” – if any – our passages suggest, I want to draw attention to the presuppositions involved in this kind of fallacious sentence, and how they relate to the name “paradoxes of presupposition”. I wish to distinguish between a technical notion of presupposition, a certain kind of semantic implication and a certain kind of unwarranted or inappropriate presumption.

Here is a rough criterion used to identify presuppositions in the *technical sense* (taken from Stalnaker, slightly modified): “Q is presupposed by an assertion that P or a question whether P just in case under normal circumstances one can reasonably infer that a speaker believes that Q from either her assertion or her denial that P.” (Stalnaker 1999, 47).¹⁰

Paradoxes of presupposition are assumed to involve presuppositions in this technical sense (presuppositions_t). Thus in our examples it is taken to be a presupposition_t of the question “Did you stop φ -ing?” that you φ -ed at a time prior to the utterance (i.e. regardless of whether in your answer you assert or deny that you stopped φ -ing). I shall take the presence of a presupposition_t to be the criterion for whether the paradox at issue is a paradox of presupposition. Contemporary philosophers differ in their views as to whether these presuppositions_t are semantic (i.e. hold between sentences or propositions) or pragmatic (are due to assumptions made by participants in the discourse).

From presuppositions_t I distinguish a certain type of *semantic implication* which also seems to occur in all cases of paradoxes of presupposition. Thus when “you stopped φ -ing” is truly uttered, then it is true that you φ -ed at some time prior to the utterance. (In other words, “ x stopped φ -ing” semantically implies “ x φ -ed”.) This implication is “inbuilt”, as it were, in the meaning of “to stop”. There are a number of verbs that have similar implications, for example to cease, to give up, to fail (which implies trying), to lose (which implies having had), etc. Linguists call

⁹ Hoc quidem quod dicunt in plerisque disputationibus procul dubio fieri oportet. Infinitus namque inexplicabilisque sermo fiet, nisi interrogationibus responsionibusque simplicibus fuerit determinatus.

¹⁰ I don’t fully agree with this criterion, as I believe in many cases there are no identifiable normal circumstances”, but simply a variety of circumstances in some of which one can “reasonably infer, etc.”, but in others not. Still, it will do as a working definition.

such verbs presupposition triggers.¹¹ According to some, it is this implication that makes questions such as the ones in the above fallacies “complex questions”.¹²

How did the Hellenistic philosophers propose to deal with these one-sentence paradoxes of presupposition? Gellius writes:

(6) For someone who has not stopped doing a thing has not necessarily ever done it.¹³ (NA 16.2.6)

And Menexenus was said to have replied:

but neither was I beating him *nor have I stopped* (my italics) (DL 2.135)

Thus, in both passages it is indicated that there are in fact three, rather than the two, possibilities that one might at first assume. Taking Gellius’ example as a paradigm, they are

1. You committed adultery and stopped.
2. You committed adultery and haven’t stopped (i.e. you are continuing to do so).
3. You have never committed adultery and hence haven’t stopped doing so either.

Gellius continues:

(7) Hence the nature of this fallacy is faulty and can by no means lead to it being inferred and concluded that someone commits adultery who says that he has not given up doing so.¹⁴ (NA 16.2.7)

Thus, Gellius implies that if the respondent replies “no”, one cannot infer from that answer that he ever was adulterous. This suggests that the above three possibilities correspond to the two permitted answers as follows:

- Yes → (1) you committed adultery in the past and don’t continue.
 No → either (2) You committed adultery and continue doing so.
 or (3) You never committed adultery.

We can take it to be assumed that (3) is what the respondent wishes to convey; so “no” is the correct answer for him. Is this a full resolution of the fallacy? It seems not. The residual problem for the respondent is that if he replies “no” *without*

¹¹ A *presupposition trigger* is a lexical item or linguistic construction which signals the existence of a presupposition in an utterance or sentence. Verbs that are presupposition triggers don’t have to take verb complements. They may have noun complements (to lose *something*), or nominalized sentence complements (to know, to regret *that p*).

¹² Some philosophers characterize paradoxes of presupposition in a different way (e.g. Rescher 2001; Layman 2002). They seem to think there is an *unwarranted* pragmatic presumption parasitic, as it were, on the semantic implication. For example, in the case of “ x stopped φ -ing” (which implies “ x φ -ed”), in a situation in which the negative sentence “ x has not stopped φ -ing” is being granted, the speaker/audience is thought to presume – allegedly without warrant – that x φ -ed. As some of the most influential philosophers who have worked on paradoxes of presupposition would not agree that this presumption is unwarranted (e.g. Strawson and Geach would not), this seems not a good criterion.

¹³ (6) Nam qui facere non desinit, non id necessario etiam fecit.

¹⁴ (7) Falsa igitur est species istius captionis et nequaquam procedere ad id potest, ut conligi concludique possit eum facere adulterium qui se negaverit facere desisse.

further explication, any audience will be likely to take him to have admitted to adultery; which is what the questioner intended to happen. But no explication is allowed. Thus for the audience, “you committed adultery” is a presupposition, of “have you stopped committing adultery”; and they assumed that from the mere denial (denial-without-explication) of “have you stopped committing adultery” one can reasonably infer “you committed adultery”. It is unclear how Gellius thought one should deal with this left-over problem.¹⁵

Menexenus advocates breaking the excluded-middle rule, and calling into question what the question seems to presuppose, (“neither was I beating him nor ...” (DL 2.135)). Some contemporary philosophers recommend a similar response.¹⁶

For both Menexenus and Gellius we can rule out that they favoured an analysis of the paradoxical questions in the manner of Strawson and Geach. For instance, Geach holds that questions of the kind “have you stopped φ -ing?” presuppose, a question “have you φ -ed?”, and that in case the latter question is answered in the negative, the former question “does not arise” and is consequently “out of place”.¹⁷ Hence neither the answer “yes” nor the answer “no” is correct. Both are inappropriate. In case the presupposed, question “have you committed adultery?” is answered in the negative, the sentences “you have stopped committing adultery” and “you haven’t stopped committing adultery” though meaningful, would each express neither a true nor a false proposition. In these cases we have truth-value gaps. Now, as Gellius suggests that the respondent may correctly answer “no” in the case in which he never was adulterous, and Menexenus replies “neither have I stopped”, we can infer that they did not entertain a Geach-Strawsonian view, and did not assume truth-value gaps.

2. The Horn paradox: authorship, attribution and classification

I now turn to a paradox of presupposition that has the form of a full argument, rather than a one-sentence question. Most probably this paradox was developed from question-fallacies like the Adultery Fallacy, by (i) taking the negative full sentence answer to the question as premiss, by (ii) taking what the audience implicitly inferred as conclusion, and by (iii) adding a suitable universal premiss. The resulting paradox is known as the Horn Paradox, Horns Paradox, Horned

¹⁵ It is possible Gellius thought that the respondent, rather than replying with “no”, should fall silent, i.e. not reply at all, as in this way he would escape the outcome that the audience infers that he was adulterous. Gellius suggests something like this for the Horn paradox. However, the response to the Horn paradox seems to be *contrasted* with that to the Adultery Fallacy, cf. NA 16.2.8, “but” (autem).

¹⁶ Layman 2002, 154: “To expose a fallacy of complex question, one must call into question what it presupposes. For instance, in this case, the response might be along these lines, ‘To put it mildly, your question is misleading; I have never beaten my wife.’” But unlike Menexenus, Layman seems to believe that answering with “no” is incorrect. See also Geach 1950, 85.

¹⁷ Geach 1950, 84–85; Strawson 1952, 175, talks about statements or propositions rather than questions, but *mutatis mutandis* makes the same point.

Man Paradox (or Fallacy) or the *Cornutus*.¹⁸ It survives in full both in Greek and in Latin:

εἴ τι οὐκ ἀπέβαλες, τοῦτ' ἔχεις, κέρατα δ' οὐκ ἀπέβαλες, κέρατ' ἔρ' ἔχεις.¹⁹
Quod non perdidisti, habes; cornua non perdidisti; habes igitur cornua.²⁰

The Greek version is ascribed to Chrysippus. The Latin version is not ascribed to a particular philosopher or school. In translation, the paradox runs:

P1 If you have not lost some thing, you have that thing.

P2 But you have not lost horns.

C Therefore you have horns.

Before I move to a philosophical discussion of the Horn paradox, I will look briefly at the surviving evidence, and extract general information about its authorship, attribution and classification. In ancient texts, Horn paradoxes (κερατίνας) are mentioned or alluded to at least seventeen times, by eleven authors.²¹ The plural (κερατίνας) we find in some texts indicates that more than one version of the Paradox was in circulation.²²

The only ancient author who attributes the Horn paradox to any particular philosopher is Diogenes, but he does so thoroughly, naming three different philosophers at three different places. At DL 2.108 we learn that the dialectician Eubulides propounded the Horn paradox; at DL 2.111 we learn that some say that the dialectician Diodorus Cronus was the first to discover the paradox; and at DL 7.186–7 it is attributed to Chrysippus as one of the arguments he used to propound.²³ Michael Psellus refers to the argument as a Stoic paralogism.²⁴ What shall we make of this? First of all, there is nothing inconsistent in these attri-

¹⁸ From Greek ὁ κερατίνης, Latin *Cornutus*, the Horned One.

¹⁹ DL 7.186–7. The context is as follows: “The philosopher (i.e. Chrysippus) also propounded arguments as the following” (DL 7.186). (Ὁ δὲ φιλόσοφος (i.e. Χρυσίππος) καὶ τοιοῦτους τινὰς ἡρώτα λόγους.) There follow six fallacies, the last being the Horn paradox.

²⁰ NA 18 2.9. For the context see Section 8 below.

²¹ DL 2.108, 2.111, 7.43–4, 7.82, 7.186–7; *Suidae Lexicon* 4.831 (identical to DL 7.82); NA 16.2.1–13, 18.2.9; Lucian, *Symposium* 23, Gallus 11; Martianus Capella 4.327, p. 151.7–8; Quintilian, *Institutio Oratoriae* 1.10.5; Seneca, *Epistulae Morales* 45.8; M. Cornelius Fronto, *Epist. Ad M. Antoninum Imp. De eloquentia* 2.16 p. 139; Sextus Empiricus, PH 2.241; Clemens Alexandrinus, *Stromata* 5.1, p. 333; Boethius, *De topicis differentiis* I.1181A; Michael Psellus, *Stoici paralogismi*, 111.2, 5–6.

²² Gellius (NA 16.2) presents a “double argument” or dilemma, for which see Bobzien forthcoming. And two sources, Sextus Empiricus and Michael Psellus, present or hint at an argument of an altogether different kind, which however seem to share the conclusion with the Horn paradox. For an analysis of this argument see Becker 1957, 54–55. For most of the ancient logical paradoxes, several versions seem to have been discussed.

²³ In the same passage Diogenes adds “some say that Eubulides (propounded) this one” (DL 7.187) (οἱ δ' Εὐβουλίδου τοῦτ'ό φασιν). This addition may have been made by Diogenes to his source, based on his report from DL 2.108, that Eubulides propounded the Horn paradox. This would also explain why the clause is lacking in the Suda passage, which otherwise is identical to DL 7.186–7. Wheeler (1983) at 190–191 suggests that Eubulides solved the paradox by denying that ‘your horns’ is a meaningful term, but does not provide textual evidence.

²⁴ Paralogism (παράλογισμός) is a Peripatetic term; the Stoics would have called it a fallacy (σόφισμα) or an intractable argument (ἄπορος λόγος, DL 7.82).

butions. Most of the logical paradoxes of the Stoics (e.g. the Liar, the Sorites, the Veiled Argument) were known and discussed in some form before Chrysippus, and the fact that they are sometimes called “Stoic” cannot be taken as evidence that the Stoics invented or – if you prefer – discovered them. It is likely that many of the paradoxes were developed in stages, from simple one-sentence problems or questions used in dialectical games into full-blown arguments. We have no reason to doubt that Eubulides and Diodorus came up with some paradoxes and refined others, including, quite possibly, the Horn paradox. The paradoxes came to be known as Stoic because some Stoics, most notably Chrysippus, wrote at length about them, and developed solutions, more thoroughly, it seems, than any other philosopher or school before;²⁵ moreover, because the Stoics, and in particular Chrysippus, improved some of the paradoxes and put them in argument form, using the terminology and tools of the newly developed Stoic logic.²⁶

The Horn paradox is described as Stoic or implied to be Stoic seven times;²⁷ it was known to the Roman Stoics Seneca and Marcus Aurelius. Apart from the attributions to Eubulides and Diodorus in Diogenes, it is not attributed to any other non-Stoic philosopher or school. So we can assume both that the Stoics discussed the paradox and that this fact was generally known; furthermore, that they suggested a resolution, and perhaps that they wrote about them more comprehensively than any others in antiquity.

The Stoics classified the Horn paradox as a fallacy or sophism (DL 7.43–4). This suggests that it was not considered to be a sound and valid argument. They also classified it among the so-called intractable arguments (ἄποροι λόγοι – DL 7.82, cf. Lucian *Symposium* 23), together with the Liar (ψευδομένοι), the Sorites (σωρίται), the Nobody (οὐτιδεις), the Veiled (ἐγκεκαλυμμένοι) and the Harvester (θερίζοντες) arguments (DL *ibid*). We have good reason to assume that Chrysippus had a go at solving the Horn paradox: he was the master logician of the Stoics, and it is ascribed to him and to no other Stoic, and it is considered as Stoic in the majority of sources. In any event, there can be no doubt that some Stoics in the Hellenistic Era discussed it.²⁸

No Stoic account of what they called intractable arguments (ἄποροι λόγοι, aporetic arguments) has survived. We can gain some information towards understanding this term by considering which sophisms were classified as intractable by the Stoics, and how the expression “intractable” was used generally in the context of arguments.²⁹ For something to be an intractable argument, it seems

not sufficient that it be mildly puzzling, yet readily resolvable. It seems, there has to be disagreement about what the resolution consists in. There must be competing solutions and no obvious criterion that helps decide which one is “the right one”. Another feature that many intractable arguments share is that what makes them puzzling are problems that today would be considered to belong broadly to philosophy of logic and language. Moreover, it seems, the arguments the Stoics classified as intractable all contained more than just one logical or linguistic problem, so that the interplay of these added to their difficulty. I argue below that – from a Stoic perspective certainly – most of these features hold for the Horn paradox. (The contemporary counterparts to many of the intractable arguments are considered as paradoxes, and ‘paradox’ would in many respects be a fitting translation of ἄπορος λόγος.)

3. What is wrong with the Horn paradox? Some more recent suggestions

What is wrong with the Horn paradox? What makes it a fallacy, i.e. what makes it appear to be a valid and sound argument, although it isn’t one? What makes it an intractable “argument”, what a logical paradox? There may have been more than one answer to these questions.

To start, I wish to show that even from a contemporary perspective, there is no agreement about how to analyse and solve the paradox. Some contemporary philosophers assume that the argument is valid, but has a false *first* premiss: It is possible that someone has not lost something, and still does not have it, viz. in the case in which that person never had the thing in the first place. End of solution.³⁰ Some may go one step further and describe the falsehood of this premiss as resting on an inappropriate presumption (Rescher 2001, 140 in tandem with 12). Second, there is a, rather different, contemporary way of dealing with the paradox: we have seen earlier that according to Strawson and Geach, a proposition like the one assumed to be expressed by the *second* premiss in the Horn paradox would be considered not to have a truth-value if the person at issue never had horns;³¹ and as this is assumed to be so, the conclusion cannot be drawn. And these suggestions do not exhaust the non-ancient views. A philosopher of the late 19th century, Carl Prantl, for instance, suggests that what is wrong with the Horn paradox is the following: for a solution “one needs to show that the connection of an isolated concept (e.g. of having) with the relations in which it can stand, which are often indefinitely many, brings nothing but confusion, and that hence only the isolated occurrence of a single such connection can warrant certainty.”³²

²⁵ Chrysippus wrote at least fourteen books on the Liar Paradox (DL 7.196–7).

²⁶ There is a one sentence Liar version in NA 18.2.10, but Chrysippus seems to have discussed the Liar as an argument. Similarly, although the Stoics seem to have discussed the Sorites in its question form, they also formulated a version in declarative sentences.

²⁷ DL 7.43–44, 82, 186–7; Michael Psellus, *Stoici paralogismi*, 111.2; Martianus Capella 4.327, p. 151.7–8; Quintilian, *Institutio Oratoriae* 1.10.5 (the mention of the sage strongly suggests Stoic origin), Lucian, *Gallus* 11 (mentioned together with Stoic double negation and the Stoic standard example “if it is day, it is not night”).

²⁸ For possible evidence that Chrysippus wrote two books about the Horn paradox see below, in Part II.

²⁹ In fact, I hope that this paper will help to shed some further light on what intractable arguments were for the stoics.

³⁰ Rescher 2001, 12: “Seeing that this paradox rests on a presupposition which, as it stands, is simply false, it is readily resolved.” This solution is compatible with Stalnaker’s theory of pragmatic presuppositions.

³¹ Strawsonians will need a very complex theory to deal with presuppositions embedded in a conditional such as the one in the first premiss.

³² “handelt es sich darum, zu zeigen, dass die Verbindung eines vereinzelt Begriffes (z.B. des Habens) mit den oft unzählig verschiedenen Beziehungen, in welche er treten kann, nur Verwirrung bringe,

Admittedly, this suggestion does not exhibit the clarity we wish a solution to have, nor perhaps much logical acumen, but it shows awareness that the concept of having is complex, and used for a variety of relations, and that this can be exploited for paradoxes such as the one at hand. On this point linguists of the 2nd century may well agree. Finally, although, as far as I can recall, Russell did not consider fallacies like the Horn paradox, we may surmise that, analogous to his treatment of the bald King of France, he might have suggested a scope ambiguity of 'not' in the premisses of the paradox.

We thus have paradox-solution-overkill: The first premiss is false; the second has no truth-value; and the argument is invalid either because it trades on a lexical ambiguity of sorts in "to have" or because it trades on a scope ambiguity of "not". I will not decide between these four solutions here. But it is worth pointing out that in each case the logical theory held by the philosophers influences the *kind* of solution they suggest, and that it is therefore not a straightforward thing to adjudicate between them – one would be likely to be adjudicating between whole logical theories. Thus, even from a contemporary perspective, the Stoic classification of the Horn paradox as an intractable argument has some justification.

Gellius, at NA 18.2.9–10, implies that in antiquity efforts were made to detect in the Horn paradox "in which words the deception of these fallacies lay and in which way they could be settled or resolved".³³ Thus, there seems to have been a discussion about which expressions in the paradox contained the sophistical element, and how the sophism could be resolved. This suggests that in antiquity, as today, there was no clear agreement about what is wrong with the Horn paradox. This on its own would presumably have justified its classification as intractable.

4. A sophistical element in the logical form of the Horn paradox?

What logical form would the Horn paradox have been thought to have, and was its form a valid form for the Stoics? The answer to these questions reveals a linguistic peculiarity in the paradox. In a very literal (and unsightly) translation of the Greek version it runs:

P1	If something you have not lost, that thing you have.	εἴ τι οὐκ ἀπέβαλες, τοῦτ' ἔχεις.
P2	But horns you have not lost.	κέρατα δ' οὐκ ἀπέβαλες,
C	Therefore horns you have.	κέρατ' ἄρ' ἔχεις.

und also nur das je einzelne Stattfinden einer einzelnen solchen Verbindung eine Sicherheit gewähre." (Prantl 1855, 53). Prantl, always an ardent advocate of Aristotle's logic, may be thinking of Aristotle *Categories* 15.

³³ NA 18.2.9, the context is: "In the third place it was asked in which words the deception of the following fallacies lay, and in which way they could be settled or resolved." (Tertio in loco hoc quaesitum est, in quibus verbis captionum istarum fraus esset et quo pacto distingui resolvique possent.) It follows the Horn paradox, and is followed by two other sophisms, one of the family of the Nobody (a quantification paradox), the other a version of the Liar.

At first blush, this seems to have the same form as, for example,

P1 If someone is walking, that one is moving.

P2 But this man is walking.

C Therefore this man is moving.³⁴

Such arguments were regarded as valid by the Stoics, though not as syllogisms. We may represent their form (with F, G for predicates, *b* for logical subject) as

P1 If someone/something F, then that one/that thing G

P2 But F*b*

C Therefore G*b*

The grammatical form of the Horn paradox differs from that of the walking-moving argument in that it is not the grammatical subject, but the grammatical object (in the accusative) of the transitive verb that is an indefinite pronoun in the conditional and for which something is instantiated in the second premiss and in the conclusion. In the Greek version this difference is muddled by the facts (i) that the flexibility of the word order has been used to put the object before the verb each time, and (ii) that the neuter plural has the same form in the nominative as in the accusative. For someone not versed in grammatical theory this difference might well have gone unnoticed. We don't know whether this peculiarity was regarded as part of the sophistic nature of the paradox. In any event, from a contemporary logical perspective, the validity of such arguments is not influenced by the question whether the instantiated terms are the grammatical subject or object, as either can be made to function as *logical* subject (see e.g. Frege 1879, 2–3), and possibly from a Stoic perspective this was so, too.

5. The Stoic Solution of the Horn paradox

Next I consider the question how the ancients, and in particular the Stoics, tried to solve the Horn paradox. In order to get any answer, we need to patch together evidence from various different sources.

Did the Stoics think that the Horn paradox was an unsound argument, i.e. that one of its premisses was false or perhaps did not have a truth-value? Or that it was an invalid argument? I believe the answer is "neither". Our evidence rather points in the direction that they considered the Horn paradox to be a collection of three sentences of which at least two are ambiguous.³⁵ Thus these sentences

³⁴ Augustine *De Dialectica* III p. 86, cf. Cicero *De Fato* 11–15.

³⁵ i.e. contain an ambiguous expression. The – or some – Stoics defined ambiguity (ἀμφιβολία) as 'an expression that signifies two or several things linguistically and in its proper sense and in the same linguistic usage, so that the several (things) are understood simultaneously in this expression'. (DL 7.62, λέξις δύο ἢ καὶ πλείονα πράγματα σημαίνουσα λεκτικῶς καὶ κυρίως καὶ κατὰ τὸ αὐτὸ ἔθος, ὥσθ' ἄμα τὰ πλείονα ἐκδέξασθαι κατὰ ταύτην τὴν λέξιν.) For an in depth discussion of this definition see Atherton 1993, 135–172. My understanding of the definition owes much to Atherton.

can be used to express several arguments, some of which are valid but unsound, others are invalid but have true premisses. How can that be?

First, for the Stoics, arguments are compounds of propositions (*ἀξιιώματα*), not of sentences. The truth-bearers are the propositions, although the only way we can express these is in sentences. Second, sentences can contain ambiguous expressions or clauses, and if they do, they can in principle be used to express a different proposition for each meaning of the ambiguous expression. Third, linguistic context of the utterance of a sentence³⁶ can determine which meaning an ambiguous expression has in the uttered sentence; and accordingly, which proposition is expressed with it. Ordinarily, the meaning is assumed to be the one which results in the expression of a true proposition. This makes some sense, as we are disposed to read the true reading of a sentence. (Note that this view does not make the meaning of the uttered sentence dependent on the intention of either speaker or hearer.) Take for instance the following sophism (the *ἀνδρείος*-Fallacy):

ὁ χιτῶν ἀνδρείος The garment is {for men/manly} .
 ὁ δ' ἀνδρείος, εὐψυχος But whatever³⁷ is {for men/manly} is courageous.
 ὁ χιτῶν ἄρα εὐψυχος Therefore, the garment is courageous.

Some Stoics claimed that each premiss, when asked, should be conceded, because (when asked) it is true.³⁸ Thus when someone utters in ordinary circumstances “the garment is *ἀνδρείος*”, the proposition expressed is that *the garment is for men*, and it is true if the garment in question is for men. And when someone utters in ordinary circumstances “Whoever is *ἀνδρείος* is courageous”, then the proposition expressed is that *whoever is manly is courageous*, which is true.

I suggest that the main perplexity of the Horn paradox was solved by the Stoics along the same lines. But that, whereas in the above sophism the ambiguity is evident and is lexical, and the fallacy is thus easily resolved with the given method, in the Horn paradox we have a hidden scope ambiguity, which is further obscured by a number of additional difficulties.³⁹

There is some evidence that the ancients thought that the Horn paradox was based on ambiguities: Quintilian implies that the Horn paradox was considered to contain “carefully incorporated ambiguities” (*exquisitas interim ambiguitates*).⁴⁰

³⁶ In the case of demonstratives extra-linguistic context would also matter, according to Stoic logic.

³⁷ Or ‘whoever’.

³⁸ It is only when the conclusion is drawn that the questioner, silently, moves from one meaning of the ambiguous term in one premiss to the other meaning, in order to warrant validity of the argument. For details see Bobzien 2006.

³⁹ The difference between lexical and syntactic ambiguities was known to the Stoics.

⁴⁰ Quintilian, *Institutio Oratoriae* 1.10.5: “But they (i.e. the philosophers, most probably Stoic philosophers) lead them (i.e. those who are to become wise) (in their instructions) through some things that are quite insignificant if one considers them solely by themselves, such as the carefully incorporated ambiguities: not because the Horn paradoxes or the Crocodile Paradoxes can make someone wise, but since the wise person must not be deceived in the smallest things.” (Nam et sapientem formantes eum qui sit futurus consummatus undique et, ut dicunt (scil. the philosophers), mortalis quidam deus non modo cognitione caelestium vel mortalium putant instruendum, sed per quaedam parva sane, si ipsa demum aestimes, ducunt, sicut *exquisitas interim ambiguitates*: non quia κεραιῖναι αὐτ κροκοδιλίνας possint facere sapientem, sed quia illum ne in minimis quidem oporteat falli.)

Similarly, Clement of Alexandria seems to draw a connection between the Horn and other paradoxes, and ambiguities.⁴¹ Moreover, Gellius’ remark that it was discussed in which expression of the Horn paradox its deceptiveness was located suggests that ambiguities were suspected.

How could the Horn paradox be explained by means of ambiguity? There is no shortage of – arguably – ambiguous expressions and phrases in the paradox, and eventually I hope to get to all those that contribute to its intractability. For now, and in analogy to the *ἀνδρείος* fallacy, we are looking for an ambiguous phrase that is shared by the two premisses, and that is such that in the “normal” linguistic (and non-linguistic) contexts of their utterance, each premiss comes out plausibly as true, though with a different meaning of the ambiguous expression in each case. The two premisses were:

P1 If you have not lost something, you have that thing. εἴ τι οὐκ ἀπέβαλες, τοῦτ' ἔχεις
 P2 But you have not lost horns. κέρατα δ' οὐκ ἀπέβαλες

They share the expression “you have not lost” (*οὐκ ἀπέβαλες*) and nothing else. I now demonstrate that this expression indeed contains an ambiguity in the Stoic sense. It is a hidden scope ambiguity which manifests the main sophistic element in the paradox. From a contemporary perspective, this puts the Stoics neither in the Strawsonian nor in the Stalnakerian camp. Rather, they are following a line that can be considered as broadly Russellian. In order to reveal the ambiguities in the paradox, I build up the two premisses step by step from their components, starting from affirmatives, moving on to the negatives, and finally to the conditional.

The relevant basic AFFIRMATIVES are the affirmation

(i) You have lost horns.

and the affirmative open sentence

(ii) You have lost *x*.

I propose that it is in the Stoic spirit to analyse the first as a conjunction, the second as a conjunctive open sentence.⁴² As we saw when discussing the Adultery Fallacy, it is a common feature of paradoxes of presupposition that they contain

In the above-quoted passage on the one-sentence presupposition paradox “have you stopped beating your father” (DL 2.135), the fallacy is called an *ἀμφιβολία*: Alexinus told him that he should have resolved the *ἀμφιβολία* by saying either “yes” or “no”. But here, I believe, *ἀμφιβολία* has its original, literal meaning of the “state of being attacked on both sides”, as Liddell/Scott/Jones 2006 put it.

Fronto may imply that the Horn paradox contained “contorted and twisted words”. M. Cornelius Fronto, *Epist. Ad M. Antoninum Imp. De eloquentia* 2.16. p. 139: “But that you learn Horn, Sorites and Liar (paradoxes), contorted and twisted words [...]” (Discere te autem ceratinas et soritas et pseudomenus, verba contorta et fidicularia [...]).

⁴¹ Clement *Stromata*, V.1 p.333: This (i.e. some polemical remarks by Timon of Phlius) is about the Falsely denying and the Horned Arguments, the Undetected, Crocodile, Sorites and Veiled Arguments, about ambiguities and fallacies.

⁴² The Stoics did have a truth-functional notion of conjunction (cf. e.g. Sextus Empiricus M 8.125, see also Bobzien 2011, Section 4). They did not have our notion of an open sentence. However, the fact that they had a conception of predicates as incomplete sayables (*λεκτά*, DL 7.63), which would become complete by the addition of a logical subject, makes this interpretation compatible

an expression, usually the main verb, that gives the relevant clauses and sentences a hidden complexity which can be made apparent by parsing them as complex clauses or sentences. (i) can thus be analysed as

Aff(i) Both you had horns and you don't have horns

and (ii) as

Aff(ii) Both you had x and you don't have x .

Is this analysis realistic for the Greek equivalent for "to lose", ἀποβάλλειν? I think it is. (Unlike the English "to lose", the Greek ἀποβάλλειν covers the throwing away or getting rid of things.)⁴³ Compare also Aristotle, who, in his *Sophistical Refutations*, writes: "if someone who has had something later does not have it, he has lost it".⁴⁴ Interestingly, this statement occurs in the context of a paradox somewhat related to the Horn paradox.

Now that a hidden complexity (a hidden conjunctiveness) has been revealed in the analysis of the affirmatives, there is room for – hidden – scope ambiguities in the corresponding NEGATIVES. There is a wide scope negative for each affirmative, and there are two different narrow scope "negatives"⁴⁵ for each affirmative. The wide scope negatives are formed by placing the negation operator "it is not the case that" in front of the entire affirmative. I add brackets for convenience.

NegW(i) It is not the case that (both you had horns and you don't have horns).

NegW(ii) It is not the case that (both you had x and you don't have x).⁴⁶

The narrow scope "negatives" are formed by placing the negation operator in front of one of the hidden conjuncts.

NegN1(i) Both you had horns and (it is not the case that you don't have horns).

NegN2(i) Both (it is not the case that you had horns) and you don't have horns.

NegN1(ii) Both you had x and (it is not the case that you don't have x).

NegN2(ii) Both (it is not the case you had x) and you don't have x .

with Stoic logic. E.g. the incomplete sayable "writes" becomes the complete sayable "Socrates writes" (a proposition) if one adds the logical subject Socrates (DL 7.63).

⁴³ You may – rightly – object that this analysis misses some subtleties of the meaning of "to lose something": for instance we may have to preclude that the object at issue has been intentionally destroyed, and no doubt there are some other such things. However, each such restriction can be readily dealt with by adding the relevant conjuncts to the antecedent in the conditional of the first premiss and to the second premiss.

⁴⁴ εἰ ὁ τις ἔχων ὑστερον μὴ ἔχει, ἀπέβαλεν, Aristotle *Sophistici Elenchi* 178a29–30.

⁴⁵ I put "negative" in quotes because, as we will see, for the Stoics, the narrow scope negatives would count as affirmatives.

⁴⁶ For easier comprehension, these can be logically transformed into truth-functional inclusive disjunctions by using DeMorgan: "either you didn't have horns or you do have horns", "either you didn't have x or you do have x "; but these would not be Stoic disjunctions, which are neither truth-functional nor inclusive.

NegW(i), *NegN1(i)* and *NegN2(i)* would be three different ways of reading the second premiss sentence of the Horn paradox, "you have not lost horns".

THE CONDITIONALS: Using *NegW(ii)*, *NegN1(ii)* and *NegN2(ii)*, we obtain three ways of reading the conditional premiss sentence "If you haven't lost something, you have that thing". In wide scope reading this becomes – with variable x and brackets added for clarity:

CondW For all things x ⁴⁷ it holds that [if it is not the case that (both you had x and you don't have x), then you have x].

And the two narrow scope readings are:

CondN1 For all things x it holds that [if both you had x and (it is not the case that you don't have x), then you have x].

CondN2 For all things x it holds that [if both (it is not the case you had x) and you don't have x , then you have x].

Now let us return to the Horn paradox. According to our analysis, each of the premiss sentences comes out as being three-way ambiguous: the first premiss sentence between *CondW*, *CondN1* and *CondN2*; the second between *NegW(i)*, *NegN1(i)* and *NegN2(i)*. If we disregard the context of dialectical discourse for the present, this makes it possible to solve the paradox in several ways, each following the same principal method: One reading of the premiss sentences makes the argument valid (by taking the phrase 'has not lost' in the same meaning in each premiss) and one premiss false. In this case the conclusion cannot be detached, because the argument, though valid, is not sound. Another reading of the premiss sentences makes both premisses true, but the argument invalid for reasons of "disconnectedness"; that is, the expression "has not lost" is taken in a different meaning in each premiss.⁴⁸ Again, the conclusion cannot be detached. The paradox receives its appearance of validity and soundness because the two different readings of the premisses are somehow amalgamated into one, and the person who considers the paradox is thus taken in.

To obtain the various ways in which this can happen, we need (a) to isolate the readings of the premiss sentences in which they are both true, and (b) the relevant cases in which the phrase 'has not lost' is taken in the same meaning in both premisses.

THE FIRST PREMISS SENTENCE was "If you haven't lost something, you have it". In wide scope reading, *CondW*, this becomes clearly false. By contrast, in the first narrow scope reading, *CondN1*, the premiss becomes clearly true. In the second narrow scope reading, *CondN2*, it is false, bordering on the absurd.

THE SECOND PREMISS SENTENCE was "But you haven't lost horns". Here the wide scope reading, *NegW(i)*, comes out true (the assumption being that human

⁴⁷ For the present I consider the Stoic indefinite conditional as if it permitted only substitution of definite singular terms for "something" and "that thing". Thus I treat "horns" as short for something like "your pair of horns" or "that pair of horns". This is an oversimplification. I return to this point below.

⁴⁸ For disconnectedness or incoherence (διάρρησις) of the premisses cf. Sextus Empiricus, M 8.430.

beings don't have horns growing on their heads)⁴⁹. But this time the first narrow scope reading, *NegN1(i)*, comes out false. And finally the second narrow scope reading, *NegN2(i)*, is clearly true again.

Thus our possibilities for arguments with two true premisses are (A) *CondN1 + NegW(i)* and (B) *CondN1 + NegN2(i)*. Our possibilities for valid arguments with at least one false premiss are (I) *CondW + NegW(i)* (F/T), (II) *CondN1 + NegN1(i)* (T/F), and (III) *CondN2 + NegN2(i)* (F/T). And our possibilities for combinations of these if one allows for two-way ambiguities are.⁵⁰ (A/I) (T/T → F/T), (A/II) (T/T → T/F), (B/II) (T/T → T/F) and (B/III) (T/T → F/T). If one allows for three-way ambiguities, there will be further possibilities such as (A/I/II), (B/II/III), (A/B/I/II/III).

Let us assume that, explicitly or implicitly, the Stoics accepted the analysis of (i) and (ii) as conjunctions, as given above in *Aff(i)* and *Aff(ii)*. I believe we cannot say with certainty which one of the possible analyses of scope ambiguities in the paradox the Stoics favoured. But we can narrow down the possibilities with some plausibility. Either the Stoics will have considered "you have not lost" (οὐκ ἀπέβαλες) as three-way ambiguous, or as two-way ambiguous between the two narrow scope readings N1 and N2. The reason for this is that one cannot reasonably accept the wide scope/narrow scope ambiguity without accepting the two narrow scope readings, since they come with the hidden conjunctiveness of the phrase.

This becomes clearer if we asked how the Stoics would have expressed the three "negatives" of (i) and (ii). In conformity with their concept of negation (Sextus Empiricus M 8.103, DL 7.69), the Stoics would have formed the wide scope negatives by prefixing "it is not the case that" (οὐχί) in front of the entire sentence:

NegW(i) It is not the case that you have lost horns (οὐχί κέρατα ἀπέβαλες)

NegW(ii) It is not the case that you have lost *x* (οὐχί *x* ἀπέβαλες)

How would they have expressed the narrow scope "negatives"?⁵¹ In conformity with what we know about their logic, the best guess is that they would have understood them to be affirmatives that contain a negative particle "within", and that they would have formulated them by placing the negative particle within the sentence, e.g. in front of the predicate (see Apuleius *De Interpretatione* 191.6–11, Alexander of Aphrodisias *An.Pr.* 402.8–12). Thus we get:

⁴⁹ On possible ambiguities of "having horns" see below.

⁵⁰ One of the premiss sentences must be taken to be true and to be the same in both readings of the pair of premiss sentences, the other must have two different readings, one true, one false.

⁵¹ For logical reasons alone, the Stoics would not have expressed the narrow scope "negatives" in the same way. They advocated regimenting language in order to eradicate ambiguities; and they defined negation and conjunction truth-functionally and accepted a rule of double negation. Thus, for example, the negation of *NegN1(i)* would have to be logically equivalent to (i), and so would have the negation of *NegN2(i)*. This would not only erase the difference between the two propositions, but is also simply false. Using standard formalization, neither $\neg(P \& \neg \neg Q)$ nor $\neg(\neg P \& \neg Q)$ is logically equivalent to $P \& \neg Q$.

NegN(i) You haven't lost horns (κέρατα οὐκ ἀπέβαλες)

NegN(ii) You haven't lost *x* (*x* οὐκ ἀπέβαλες)

However, as we have seen, there are two ways in which one can produce narrow scope "negatives" of (i) and (ii). Thus the sentences that express affirmatives with embedded negative particles are still ambiguous. Either the first, or the second, conjunct of the hidden conjunction is understood to be negated.⁵² I favour the view that the Stoics took the phrase "has not lost" in the Horn paradox to be three-way ambiguous. They may have resolved it in more than one step, by first distinguishing the readings involving wide scope, by requiring the negation to be put in front of the relevant sentence or clause, and then dealing with the residual narrow scope ambiguity.

So far I have considered the Horn paradox "statically", i.e. as a fallacy formulated in three declarative sentences, for which a solution is sought by investigating it as a whole. However, the most common way of presenting paradoxes was "dynamically", in dialectical discourse, where the respondent would have to agree or disagree with each sentence as it was presented. This was certainly the case with the Horn paradox. Considering the discourse version of the paradox allows us to further narrow down the options for relevant ambiguities in the paradox. What strategy or method did the Stoics suggest for dealing with the discourse version? In the discussion of the paradigm argument for a fallacy of ambiguity given above (the ἀνδρείος fallacy), the method was to take each ambiguous premiss sentence as expressing a true proposition, if there is a reading which makes it clearly true.

In accordance with this strategy, the Stoics would have read the first premiss sentence as containing *NegN1(ii)*,⁵³ as

CondN1 For all things *x* it holds that [if both you had *x* and (it is not the case that you don't have *x*), then you have *x*].

and the second premiss either as

NegW(i) It is not the case that (both you had horns and you don't have horns)

or as

NegN2(i) Both (it is not the case that you had horns) and you don't have horns.

⁵² The Stoics could thus (1) either have claimed that the two premisses *could not* be interpreted with wide scope, and thus that the premisses are only two-way ambiguous. Or (2) they could have claimed that they are three-way ambiguous. In favour of the first view (1) one may adduce that in all surviving formulations the negation is put within the sentences (in front of the predicate), and not prefixed to the whole sentences. However, given that the Stoic language regulation suggestions are introduced as ways of diminishing ambiguities and other logico-linguistic problems, the Stoics cannot assume that proponents of paradoxes heed them – especially so if the paradoxes are used as fallacies, i.e. to deceive the audience or respondents. Moreover, in Greek as in English, we can observe the phenomenon of what is sometimes called "negation hopping", i.e. the tendency of putting negations in front of the predicate, or somewhere else within the sentence, even when it has (or is intended to have) wide scope.

⁵³ This is further corroborated in later sections.

Given that human beings don't have horns, *NegN2(i)* may have the edge over *NegW(i)* here. When the questioner draws the conclusion, he silently moves from *CondNI* to *CondW* or *CondN2* respectively.⁵⁴ The Stoic solution would then likely have consisted in pointing out the ambiguity of the premise sentences and the fact that the questioner, when drawing the conclusion, makes illicit use of this ambiguity.

Strictly speaking, the paradox is thus not an argument in the Stoic sense. For the Stoics, arguments are compounds of premisses and conclusion, each of which is a proposition (ἀξιωμα). But the paradox is a collection of three sentences at least two of which can be used to express more than one proposition; which one it expresses depends in part on the circumstances.

How does the Stoic solution compare with those based on Strawson's or Stalnaker's theories? For the Stoics, unlike the Strawsonians, all the premiss sentences when uttered express either a true or a false proposition (*pace* Künné 1982). And in contrast with the Stalnakerians, it is not simply the case that the first premiss is unambiguous and false, the second unambiguous and true, and the rest a matter of context. Rather, it seems the Stoics held that at the base of the paradox is a hidden scope ambiguity of negation. I propose to call this kind of solution of the paradox a Russellian solution. For, if we compare how Strawson and Russell treat definite descriptions (the notorious example of the King of France), we see that Strawson introduces truth-value gaps based on faulty presuppositions, whereas Russell postulates a hidden scope ambiguity of negation. And this is exactly what I suggest the Stoics did in the case of the premisses of the Horn paradox – only that in the Horn paradox there is a hidden *conjunction*, not a hidden existential sentence, so that we have a three-way, as opposed to a two-way ambiguity.⁵⁵

There is some collateral evidence for the suggestion that the Stoics would have used a Russellian approach to the solution of the Horn Fallacy.⁵⁶ For we know that some Stoics took a Russellian approach when giving the semantics of simple propositions which contain a negation prefixed to the predicate rather than to the whole sentence; i.e. with narrow rather than wide scope. They suggested that whereas “Not: Callias walks” is the negation and contradictory of “Callias walks” and true if and only if the latter is false, the sentence “Callias does not walk” expresses a conjunction one conjunct of which indicates that Callias exists: “There is some Callias and not walking belongs to him”. (Alexander of Aphrodisias *An.Pr.* 402.1–19; cf. Apuleius *De Interpretatione* 191.6–11). Here, as in Russell's theory of description, what grammatically appears to be a subject functions logically as a predicate. Thus the negation has narrow scope. By contrast the sentence

⁵⁴ Or alternatively, from *NegW(i)* or *NegN2(i)* to *NegNI(i)*.

⁵⁵ The “Russellian” solution presupposes an analysis of the meaning of “you have lost *x*” as being a conjunctive, with the conjuncts “you had *x*” and “you don't have *x*”, or something very similar. Strawsonians would not agree with this analysis. They would take “you had *x*” as presuppositional for “you have lost *x*”. This difference in meaning analysis is significant for the difference in the two types of solution. Does the Russellian solution then not do away with the presuppositions that give the fallacies of presupposition their name? The answer is yes; for that is the nature of a Russellian solution: that what appears to be a presupposition turns out not to be one.

⁵⁶ I am indebted to Victor Caston for reminding me of the relevance of this evidence to the Horn Fallacy.

“Not: Callias walks” expresses a negation, since the negator has wide scope. Fully analyzed it would be “Not: both there is some Callias and walking belongs to him”.⁵⁷ This Russellian treatment of wide and narrow scope negation shows that the Stoics had all the means available for the Russellian solution of the Horn Fallacy suggested above.⁵⁸

Could the Stoics have considered their Russellian solution of the Horn Fallacy a complete resolution of the paradox? Possibly not. For the resolution is based on an over-simplification of the fallacy, which hides the fact that it contains several further logical difficulties. For most of these difficulties there is some independent evidence showing that the Stoics, or some other ancient philosophers, gave them some attention.

6. “To have” and “to lose”

First, we can show that Carl Prantl was not entirely off his trolley. For there is on the surface a structural incongruence between the Greek verbs ἔχειν (τι) and ἀποβάλλειν (τι) which is pertinent to the fallacious appearance of the paradox. There is a similar incongruence for the English verbs “to have (something)” and “to lose (something)”. The verb “to have” is used for a variety of significant relations between things of very different kinds. (You have a headache, a master's degree, apples, legs, breakfast, time.) Two very common usages are relevant to our paradox. These are two uses which, when they take the same grammatical object, can only be distinguished by context, and which belong to linguistic categories often called inalienable possession and alienable possession, respectively.

Consider the question: “Do you have legs?”. Mostly, this sentence will be understood to be about an ordered relation of possession between the person – or living being – at issue and natural parts of their body (inalienable possession). However, if uttered e.g. by a customer in a butcher's shop, the sentence will be understood quite differently. Here the relation will be one of possession between the person at issue and something else's legs (alienable possession).⁵⁹ From a Stoic perspective, we could say that the expression ‘to have legs’ is ambiguous between being in possession of one's own legs, i.e. certain parts of one's body, and being in possession of some legs that are not part of one's body. Chapter fifteen

⁵⁷ On this Stoic treatment of wide and narrow scope negation cf. also Lloyd 1978.

⁵⁸ Without mentioning Russell, Schulthess (2002, 98) suggests even that the Stoics used the Horn Fallacy in order to illustrate and defend their requirement that in a negation the negator needs to be pre-fixed to the proposition it negates, in order to ensure that it governs the entire proposition rather than a mere part of it. Cf. also Schulthess 1996.

⁵⁹ Whereas in the first case, “Do you have your legs?” would be a satisfactory, if unidiomatic, paraphrase, in the second case it would not. But things are in fact more complicated. “Does Katy still have her milk teeth?” could ask for whether she still has them in her mouth, or alternatively whether she still keeps them in that silver box on the mantle-piece in contrast to having finally thrown them away; so in instances of the second case it does not *have to be* someone/something *else's* body parts. But they must be no longer in the place where they naturally grew and formed part of the being at issue.

of Aristotle's *Categories* shows that the ancients discussed those two readings of 'to have', and regarded 'to have' as ambiguous.⁶⁰

The phrase "to have horns" works in the same way as the phrase "to have legs". In most contexts, it will be used to indicate a relation of possession between an animal or a – mythological – person and their 'body parts', the horns, which are grown on their heads. (Consider the question "Do female goats have horns?"). Thus "you have horns" may be paraphrased as "you have horns growing on your head". In the context of dialectical discourse, where, as a rule, there is no specific context, this is almost certainly how the sentence would be taken. On the other hand, some ancient Greek who intends to acquire goat horns for the production of drinking vessels, may well ask a shepherd or farmer "do you have horns?", where this would be understood in a rather different way.

This ambiguity does not fully carry over to the verb "to lose" (ἀποβάλλειν). Rather, in idiomatic English (and Greek) the two cases would be distinguished linguistically on the surface level. "He has lost legs" would not be an idiomatic way of saying that a person lost (all) their legs. "He has lost his legs" would be. It would be idiomatic to say "he has lost legs", e.g. if a butcher's shop was plundered by a pack of wild dogs. ("He has lost legs, drumsticks, and sausages, but all the whole chickens are still there.")⁶¹ Admittedly, such situations of use are rare. More often, the sentence "he has lost legs" may be taken as an unidiomatic attempt at stating that he has lost *his* legs; but that does not matter here. In Greek the corresponding difference would be between "He has lost legs" and "He has lost *the* legs" (as in French).

Again, what holds for sentences concerning the loss of legs holds *mutatis mutandis* for sentences concerning the loss of horns. "You have lost your horns" ("the horns", in Greek) would be idiomatic for losing the horns on one's head; "you have lost horns" would not, but would be an idiomatic way to express e.g. that a maker of drinking vessels lost some goat horns.

What is the impact of this incongruence on the paradox? The second premiss is "But you have not lost horns", and the conclusion is "Therefore you have horns". This is precisely what the conditional premiss would require in order for there to be a formally valid argument. For "something" and for "that thing" in the conditional premiss, exactly the same expression, "horns", is substituted. Thus on the surface, everything seems to be as it should be. However, assuming the paradox concerns self-grown head horns, what we would want (from a point of view of idiomatic and grammatical expression) seems to be:

⁶⁰ According to Aristotle *Categories* 15, 15b17–32, the two readings are of having "as a part (ὡς μέρος), like a hand or foot" (15b23) and presumably "as a possession (ὡς κτήμα)" (15b26). Whether these two uses of "to have" would constitute an ambiguity according to contemporary linguistics is a different question. (Perhaps a case for ambiguity could be made. "Do chicken have arms?" could not be answered in the affirmative, if they kept a dolls' arms collection in their cupboard. Similarly, "Does Anna still have her legs?" could not be answered in the affirmative, if she kept her amputated legs in the freezer. Could "One-legged Paul has two legs" be true, if Paul has a chicken leg on his plate?)

⁶¹ Note, however, that the ambiguity is retained in some cases: "she has lost a leg", "it has lost one/two/three/several legs" (the centipede or spider, for instance).

If you have not lost something, you have that thing
You have not lost *your* horns
Therefore you have horns.

But in this way the – apparent – formal validity of the "argument" would not be retained. To retain a valid form, there are two possibilities: (i) The conditional premiss becomes "If you have not lost your (in Greek "the") something, you have that thing". But this works neither in English nor in Greek. (ii) Alternatively, the conclusion becomes "therefore you have your horns ("the horns" in Greek)"; this would also be unidiomatic.

This lack of congruency between surface form and logical structure is perhaps no big deal. But it helps to confound someone who is presented with the paradox. If the logical structure were made to be reflected in the surface structure, the argument would no longer have the right form, and the respondent could simply argue that it is straightforwardly invalid.

More importantly, if the respondent were confronted with the second premiss sentence in the form "you have not lost *your* horns" (τὰ κέρρατα) he could refuse to concede it, on the grounds that the use of the phrase "your horns" (τὰ κέρρατα) implies that the answerer has or had horns, or that there are some specific horns which the answerer has not lost,⁶² or if not implies, then presupposes.⁶³ As a result, the answerer may balk at the second premiss. This is not the case with the original formulation, which – at least in common usage – allows a reading that neither implies nor presupposes, that there are such horns.⁶⁴ Thus the respondent is more easily tricked.

7. Ambiguities of quantification: indefinite plural nouns

So far I have treated the Horn paradox as if the indefinite and anaphoric pronouns in the first premiss were to take a definite singular expression for substitution, and have treated the expression "horns" in the second premiss and conclusion as if it were short for a definite singular expression, e.g. "your pair of horns":

For all things x it holds that [if you have not lost x , then you have x]
 $\forall x$ (you have not lost $x \rightarrow$ you have x)

However, it is at the very least problematic to take it this way. The substituted expression, "horns", is in fact an indefinite plural expression, and this has consequences for the logical form of the first premiss.

⁶² There is an ambiguity here in the Greek which is not present in English.

⁶³ In this case "your horns" function as a proper definite description and thus as a presupposition trigger.

⁶⁴ Perhaps one could object that the second premiss and conclusion each cover horns in general, including both self-grown head horns and other horns, and that the conclusion sentence is not ambiguous. This seems not beyond doubt. (In our milk teeth example, would we say "Katy and Billy still have their milk-teeth" is true if Billy has them in his mouth and Katy in the box on the mantelpiece? Doubtful.) Moreover, intuitively at least, the horns mentioned in the conclusion should be *the same* as those mentioned in the second premiss, or at least include those. And this would not be the case if the objection were granted. See on this point also the next section.

In order to avoid thinking inadvertently of the horns as short for a definite singular expression, let us use “apples” instead of “horns” for the moment. Thus it becomes clear that, if the appearance of validity is to be preserved, the first premiss needs to be understood as covering indefinite plural expressions. So we could paraphrase

PI' If you have not lost some *things*, then you have *them*.⁶⁵

And the rest of the argument, applied, becomes

$P2'$ But you have not lost apples.

C' Therefore you have apples.

On the surface, this seems to preserve the argument form given at the beginning of the section. However, we do not naturally read the first premiss in such a way that we can replace both “some things” and “them” in it with “apples”. Substituting “apples” in the first premiss makes this clearer:

(A) If you have not lost apples, then you have apples.

This is usually short for

(A') If you have not lost any apples, then you have some apples.

Or formalized

(A')_f (not: $\exists x$ (x is an apple and you have lost x)) \rightarrow $\exists x$ (x is an apple and you have x)⁶⁶

And more generally

(PI^{\wedge}) $\forall \Phi$ (not: $\exists x$ (Φx & you have lost x)) \rightarrow $\exists x$ (Φx & you have x)⁶⁷

This kind of reading certainly differs from our three previous ones ($CondW$, $CondNI$, $CondN2$). In any event, what we would expect is that what is substituted for “them” in the first premiss would do justice to the anaphoric function of “them” in that premiss sentence. Something like:

(A^*) If you have not lost any apples, then you have *them* (*those apples*).

But what could this sentence mean – if it means anything; that is, if it is not ill-formed? One possibility would be:

($A^{*'}_f$) If you have not lost any *of your apples*, then you have them (i.e. your apples)

⁶⁵ I intend this to be short for “If you have not lost some thing or some things, then you have it or them”.

⁶⁶ Or on the domain of apples: (not: $\exists x$ (you have lost x)) \rightarrow $\exists x$ (you have x).

⁶⁷ Neither (A') nor (PI^{\wedge}) does justice to the plurality of items at issue. Perhaps one could try out plural quantifiers here, but I’m not sufficiently familiar with their theory.

Some may suggest that this implies that you had apples. This would require a rather more complex formalization.⁶⁸ Perhaps:⁶⁹

$\exists x$ (x is an apple & x is-or-was yours) & $\forall x$ (((x is an apple & x is-or-was yours) & you have not lost x) \rightarrow you have x)

Or at least, it seems, ($A^{*'}_f$) presupposes_t that you had apples, with “your apples” functioning as an implicit presupposition trigger. Either kind of reading clearly differs from the readings of the first premiss sentence given earlier ($CondW$, $CondNI$, $CondN2$, PI^{\wedge}). None of them entailed or presupposed_t that you had the things which you have if you haven’t lost them – or even that they exist. If we read “have not lost” in ($A^{*'}_f$) as $NegW(ii)$ or $NegN2(ii)$ we get two rather weird statements to make.⁷⁰ $NegNI(ii)$ on the other hand makes some sense.

If you think that ($A^{*'}_f$) over-interprets (A^*), by postulating the existence or presupposition_t of apples, we are left, in the consequent, with what is sometimes called “donkey anaphora”.⁷¹ The pronoun “them” in the consequent is not a term referring to any particular apples, and it is doubtful whether one could identify a quantifier in the antecedent which would bind ‘them’, thus giving it the function of a variable. We cannot bypass this problem by paraphrasing (A^*) as

($A^{*''}$) If you have not lost any apples, then you have those you have not lost.

Perhaps ($A^{*''}$) should be called ill-formed. In any case it seems neither to entail nor to presuppose_t that you had any apples. So it differs from (A^*). Still, again, if we read ‘have not lost’ in ($A^{*''}$)⁷² with $NegW(ii)$ or $NegN2(ii)$ we get two rather odd statements to make – this time close to meaningless;⁷³ $NegNI(ii)$ on the other hand works fine:

$CondNI A^{*''}$ If both (you had apples and (it is not the case that you don’t have them)), then you have *them*.

⁶⁸ Rather more complex than:

$\forall x$ (x is an apple \rightarrow (you have not lost $x \rightarrow$ you have x)), or

$\exists x$ (x is an apple and you have not lost x) \rightarrow $\exists x$ (x is an apple and you have x).

⁶⁹ Again, the plurality of items (apples) is not captured, and if we were to generalize over kinds of things in general instead of just apples, perhaps plural quantifiers would help.

⁷⁰ E.g. substituting $NegN2(ii)$ we get:

$\exists x$ (x is an apple & x is-or-was yours) & $\forall x$ (((x is an apple & x is-or-was yours) & (both (it is not the case you had x) and (you don’t have x)) \rightarrow you have x).

⁷¹ For donkey anaphora and other problematic anaphora see e.g. King 2010.

⁷² More precisely in (A^*) read as ($A^{*'}_f$).

⁷³ E.g. by substituting $NegN2(ii)$ (“both (it is not the case you had x) and you don’t have x ”) we obtain:

If (both (it is not the case you had some apples) and you don’t have them), then you have *them* (*those apples*).

and more generally

If (both (it is not the case you had some things of a certain kind) and you don’t have those things), then you have *them* (*those things*).

*CondNI**'' If both (you had some things of a certain kind and it is not the case that you don't have them), then you have *them*.

So if we take into account that we have in fact *indefinite plural expressions* to be put in for the indefinite and anaphoric pronouns in the first premiss, there is a further reason why it would be naturally read as containing (*NegNI(ii)*) rather than its alternatives. For it is doubtful whether the alternatives make any sense. With definite singular expressions this was not the case. Thus the paradox has a further edge to it, which would have made it harder to spot the fallacious element in the paradox.

The Stoics were aware of problems of substituting *indefinite* expressions for indefinite and anaphoric pronouns. This can be seen from a variant of their Nobody Paradox, reportedly propounded by Chrysippus, which substitutes an *indefinite singular* expression:

If someone is in Athens, that one is not in Megara.
Now a person is in Athens.
Therefore a person is not in Megara. (DL 7.187)

where the conclusion would have been understood as equivalent to "no person is in Megara". Hence we can assume that the parallel difficulty in the Horn paradox did not go unnoticed.

8. Further subtleties in the paradox: the conclusion

The numerous allusions to the Horn paradox in antiquity can be taken as a sign of its popularity. This will have been so in part because it is an intractable argument, and as such – as we have seen – difficult, multiply ambiguous, and without one generally accepted solution. Hence it would have provided continuous fodder for discussion. However, we can assume, part of its popularity was due to its conclusion, "therefore you have horns", which itself can be taken in several ways. The obvious, non-metaphorical way is, as we have seen above, that the person questioned – who as a rule would have been male – has been shown literally to have horns, i.e. growing on his head. This on its own must have been sufficient to ridicule the respondent and amuse the audience. Being of (at least partly) human form and having horns belongs to the stock of what is visually imaginable in Hellenistic Greece. The audiences' imagination will immediately run to the figures of satyrs, Pan, and the *tragoi*, who all are (partly) human in form, and all have horns.⁷⁴ And this comparison will not have been flattering for the respondent. Of course there is the second non-metaphorical meaning, that the respondent is in the possession of some animal horns in the form of drinking vessels or musical instruments, or horn as raw material.⁷⁵ But I doubt that anybody would have

⁷⁴ Originally Satyrs were thought to look more like horses, but in Hellenistic times they had acquired part human part goat form, wearing horns on a human head, similar to the *tragoi*, and to Pan.

⁷⁵ Cf. Liddell/Scott/Jones 2006, s.v. κέρατα, for the multitude of meanings of that word.

understood the conclusion in this way, given the generally non-specific context of a dialectical contest.

Yet this is not all. In addition to the literal meaning(s) there is in ancient Greek (just as in old-fashioned English, and in German) the metaphorical meaning of the conclusion that the answerer has been cuckolded, has horns because he has been given horns.⁷⁶ This would not have escaped a perceptive – or not so perceptive – audience, and would have made the respondent a laughing stock twice over. Of course the questioner would not have explicitly claimed to have shown this, nor would the metaphorical meaning qualify as an ambiguity according to the Stoic definition. But the audience would recognize and relish the metaphorical meaning, and the respondent would have no means to defend himself.

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⁷⁶ κέρατα ποιῆν τινα, to give s.o. horns, cf. Artemidorus *Onirocriticon* II ch.12 lines 33–4. [...] προσηπτεῖν αὐτῷ ὅτι ἡ γυνὴ σου πορνεύσει καὶ τὸ λεγόμενον κέρατα αὐτῷ ποιήσει.

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False ἔνδοξα and fallacious argumentation

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Abstract

Aristotle determines eristic argument as argument which either operates upon the basis of acceptable premisses (ἔνδοξα) and merely give the impression of being deductive, or argument which truly is deductive but operates upon the basis of premisses which seem to be acceptable, but are not (or, again, argument which uses both of these mechanisms). I attempt to understand what Aristotle has in mind when he says that someone is deceived into accepting premisses which seem to be acceptable but which are really not, and how this disqualifies such arguments from being dialectical. In the first section of the paper I interpret Aristotle's notion of ἔνδοξα in terms of a relational concept of acceptability. Real ἔνδοξα are propositions which are accepted by a qualified group or individual. False ἔνδοξα may also be accepted by someone or some group, and may even be true, but they are used to serve the purposes of eristical argumentation, which departs from certain standards of dialectical argumentation articulated in the notion of ἔνδοξα as a norm for premiss-acceptance. In particular, eristic arguments may even be valid in the sense of a συλλογισμός while still failing to be proper dialectical arguments. In the second part of the paper I consider how this can be, in examining certain types of fallacies in the *Sophistical Refutations* and the relationship between fallacious argumentation and false ἔνδοξα.

1. Introduction

In the first chapter of the *Topics* Aristotle introduces the notion of “eristic argument”:

Eristic is deductive argument upon the basis of premisses which seem to be reputable, but are not, as well as argument which seems deductive, be it from reputable or reputable-seeming premisses (ἐριστικός δ' ἐστὶ συλλογισμὸς ὃ ἐκ φαινομένων ἐνδόξων μὴ ὄντων δέ, καὶ ὃ ἐξ ἐνδόξων ἢ φαινομένων ἐνδόξων φαινόμενος). (*Top.* A 1, 100b24–25; cf. *SE* 2, 165b7–8)

This passage identifies two mechanisms by which the eristic arguer deceives his interlocutor. The first mechanism makes an argument seem to fulfill the conditions of a συλλογισμός, a deductive argument, when it really does not fulfill these conditions. Eristic arguments by this mechanism are not deductive arguments at all; their mechanism of deception is to seem deductive. The second mechanism of eristic argument may also be employed in deductive argument. It is therefore not, strictly speaking, a means of *logical* deception. It operates on the level of individual propositions used as premisses and aims to effect the acceptance of certain propositions as reputable premisses when they are not. But what does Aristotle mean when he says that we may be fooled with regard to the reputability