

# Ibn Sina on modes, *cIbāra* ii.4

6 February 2010

(9 February 2010) The translation is complete but not yet checked by a native Arabic speaker.

My introduction is far from complete. It will need to include a discussion of Ibn Sīnā's *Qiyās* iii.4 and iii.5, where he develops his discussion of 'possible'. In *Qiyās* iii.4 he picks up an idea of Aristotle (which he paraphrases away in [2.4.19] below) that fire *can* burn things, but when something flammable is put into fire, the fire can't help burning it. Ibn Sīnā investigates the idea that in some cases the basis for saying that *A* can do *B* is that under certain circumstances *A* necessarily will do *B*; so a possibility rests on a hypothetical necessity. In *Qiyās* iii.5 he compares possibility with probability, and remarks that in medical textbooks most statements are to the effect that something is probable. He ties this in with hypothetical necessity. Scammony is a purgative, usually. That's because it always is if the right conditions are met. (In *Burhān* he picks this up from an epistemological point of view. We can know that under the right conditions scammony necessarily acts as a purgative, without knowing exactly what those conditions are. See the translation of this section of *Burhān* in *Classical Arabic Philosophy: An Anthology of Sources*, ed. Jon McGinnis and David C. Reisman, Hackett, Indianapolis 2007, pp. 147–152, and the discussion in Jon McGinnis, 'Scientific methodologies in medieval Islam', *Journal of the History of Philosophy* 41 (2003) 307–327.) In the course of explaining probability in *Qiyās* iii.5, Ibn Sīnā introduces the quantifier 'More *As* are *Bs* than are not *Bs*'. Is this the source of the Rescher quantifier 'There are more *As* than *Bs*', introduced by Ibn Sīnā's interpreter Nicholas Rescher?

Also the notes are unfinished.

Wilfrid Hodges

## 1 Modes

Ibn Sīnā considers three modalities: necessary, possible and impossible. In fact he distinguishes two versions of 'possible', namely not-necessarily-not (which he calls broad-possible) and contingent, i.e. not-necessarily and not-necessarily-not (which he calls narrow-possible, or elsewhere 'genuine possible'). But he treats necessary and narrow-possible as basic, and between these two, necessary is more basic than narrow-possible. The distinction between necessary and broad-possible is one of strength REF. Palmer [13] p. 36 suggests referring to the distinction between necessary, possible etc. as one of 'degree'.

Ibn Sīnā is a tireless taxonomist, and he subdivides the degrees of modality in at least three different dimensions.

First he distinguishes what Palmer [13] p. 36 would call different 'kinds' of modality. Using names based on Von Wright [14], we can find at least the four following kinds of modality among his examples.

*Kind One: Alethic.* A thing is necessary if it has to be the case. A thing is impossible if it couldn't possibly be the case. Ibn Sīnā has no special category of logical necessity and possibility.

*Kind Two: Temporal.* A thing is necessary if it holds at all times. A thing is possible if it holds at least once. Ibn Sīnā often talks as if this was the only kind of modality. But since he is clearly well aware that it isn't, we should probably regard this notion as a kind of place-holder. In any case there is a question whether 'all times' is shorthand for something more general. I will argue that it is, and that Ibn Sīnā's temporal 'necessary' can be read as a universal quantification over all ways of fixing the parameters of a sentence. The point is very important for judging the strength of Ibn Sīnā's logic. In this broader reading, Ibn Sīnā's temporal modalities are essentially quantifiers, which makes them cases of Von Wright's 'existential' modes REF.

Ibn Sīnā also notes a kind of possibility which he calls 'narrowest-possible'; a thing is narrowest-possible if it will be the case sometime in the future. Rather confusingly he contrasts this with other degrees of possibility, when it is surely a sub-kind of the temporal.

*Kind Three: Dynamic.* A thing is possible for me if I can do it. We can further distinguish things that I can do at once from things that I can train myself to do, or grow into doing. REF.

*Kind Four: Epistemic.* This kind is more shadowy, but Ibn Sīnā's 'conceivable' (114.17) looks like a kind of epistemic possibility.

Note that Ibn Sīnā never considers deontic modalities such as 'He must do this', 'You may do that' (in the sense of giving permission). Perhaps he regards propositions of these kinds as not declarative, so that they fall outside the purview of logic. REF.

Second he distinguishes the scope of a modality in a sentence. Normally he distinguishes two cases: modality in consideration of the predicate, and modality in consideration of the quantifier. ELABORATE THIS.

And thirdly, when we say that a certain sentence  $S$  is necessary, possible etc., we might mean any of the following four things:

1. We can mean that the modality is explicit in the sentence  $S$ .
2. We can mean that whether or not the modality is explicit in the sentence, it is contained in what the speaker meant by uttering  $S$ .
3. We can mean that the sentence  $S$  is necessarily (or possibly) true.
4. We can mean that what the speaker intended by  $S$  is necessarily (or possibly) true.

## 2 The scope of a modality

The basic is: Anything satisfying I (individual essence) must also satisfy B.

This generalises to quantified statements: 'Every A is necessarily B' expresses the conjunction of all statements 'I is necessarily B' where I ranges over essences of individuals. (kullu wahidin, 115.2f)

Note that this is not the same as: Anything satisfying A must also satisfy B. This latter is stronger because it also covers unsatisfied refinements of A.

The predicate/proposition analogy gives in the same way:

'If A then necessarily B' expresses the conjunction of all statements 'If T then necessarily B' where T ranges over essences of times etc.

Elsewhere in both logic and metaphysics, Ibn Sīnā has a different notion: 'A is possibly satisfied' (mumkin al-wujuud). (Page 117 below. Note also 'sometimes satisfied', which is not the same.) Technically this is definable from (the possibility counterpart of) the other in either of two ways:

(1) Anything satisfying the essence of A can satisfy 'satisfiable'.

(2) Not: if A then necessarily an absurdity.

Or in the other direction: 'Anything satisfying I must also satisfy B' is 'Not: I-and-not-B is satisfiable'.

A possibly weaker relation is 'From the definition of I we can deduce the definition of B'. Is it actually weaker? If he thought not, he thought everything necessary is provable, in some form. He might have discussed this somewhere.

### 3 Reducing quantifier modality to predicate modality?

One argument against the reduction is that Ibn Sīnā apparently counts 113.7 as negative although it has the form 'It is possible that  $\phi$ '. Note the two criteria for affirmativeness: (1) predicate is asserted of subject, (2) sentence is false when subject is empty.

In several places he makes it clear that 'possibly not X' is an affirmative predicate. Hence

(1) A is possibly satisfied.

and

(2) A is possibly not satisfied.

are always false unless there is an A. So by pure semantics we deduce that there are no possible things that are not actual.

### 4 The translation

/112/ Section ii.4. On modal, i.e. quadripartite, propositions: their contents, their implications and the propositions that conflict with them.

[2.4.1] The least common case of propositions is the the 'bipartite'. Then there are those with an explicit copula; they form the 'tripartite' propositions. 112.5

Then there are those with a modality connected to them, and these are the 'quadripartite' propositions. The modality is an expression that signifies the connection which the predicate has to the subject. It specifies that the connection is necessary or not necessary, and it signifies certainty or possibility. The modality can also be called the 'mode'.

[2.4.2] There are three modalities. One signifies the requirement that the satisfaction is permanent; this is the 'necessary'. Another one signifies the requirement that the non-satisfaction is permanent; this is the 'impossible'. And another one signifies the failure of the requirement that either the satisfaction or the non-satisfaction is permanent; this aspect is the 'possible'. 112.8  
112.10

[2.4.3] The difference between the modality and the matter is that the modality is an expression in addition to the predicate and the subject and the copula (when the copula is explicit). It signifies the strength or weakness of the copula; this is something signified through the expression, and it can be false. Turning to the matter — which is also known as the 'element': this is the inherent affirmative relation of the predicate to the subject, i.e. the way it is true [of the subject]. If there was an expression that signified this [relation], it would signify it through the modality. A proposition can have a modality that disagrees with its matter. Thus if you said 112.10

(3) Every human must be a writer.

the modality would be necessary but the matter would be possible. 112.15

[2.4.4] The quantifier should be adjacent to /113/ the subject, and the copula should be adjacent to the predicate. In the same way the modality should be adjacent to the copula if there is no quantifier. If there is a quantifier there are two places [for the modality], namely [adjacent to] the copula and [adjacent to] the quantifier, leaving aside the question whether both places give the same meaning or different ones. You have the choice of attaching the modality in the first place or the second. Thus you can say 112.15

(4) It's possible that everybody is a writer.

and you can say

(5) Every person can be a writer.

Likewise you can say 113.5

(6) It's possible that some person is a writer.

and you can say

(7) Some person can be a writer.

[2.4.5] Arabic has only one way of expressing the negative universally 113.6

quantified [modal proposition], namely by saying

(8) It's possible that nobody is a writer.

There is no other way of saying it with the modality linked to the copula rather than the quantifier, unless you say

(9) There is nobody apart from those who can fail to be writers.

or

(10) Everybody can fail to be a writer.

But this expression looks like an affirmative proposition. We have two sentences which both express the negative existentially quantified [modal proposition], namely 113.10

(11) It's possible that not every person is a writer.

and

(12) Somebody can fail to be a writer.

[2.4.6] We will check what is said about these [propositions], and we will consider whether the meaning of [the proposition] in which the expression of modality is connected to the copula, and [the meaning of the proposition] in which the expression of modality is connected to the quantifier, are the same or not, and if they are not the same, whether the two entail each other or not. But before this, there is something else that you need to know. 113.11

[2.4.7] We say: When you have a singular proposition with no copula in it, if you want the negation then naturally you have to connect the negating particle to the predicate. Likewise when your proposition includes the copula of the predicate, if you want the negation then you have to attach the negating particle to the copula. So the negation of the sentence 113.13

(13) Zayd is just. 113.15

is not the sentence

(14) Zayd is not-just.

but rather the sentence

(15) Zayd is-not just.

How could it be otherwise, when both propositions [(14) and (13)] can be false [together] when Zayd doesn't exist?

[2.4.8] In the same way, if your sentence has the modality attached to the copula, when you want the negation you have to connect the particle of negation to what preceded [the modality], so that you negate /114/ all of what follows [the modality], not just some of what follows it. Thus when you say 113.18

(16) It's possible that Zayd is a writer.

its negation is not the possibility of the negation, but rather the negation of the possibility. I mean that it is not the sentence

(17) It's possible that [Zayd] is not [a writer].

but rather the sentence

(18) It's not possible that [Zayd] is [a writer].

How could it be (17)? The sentences (17) and (16) can both be true together. Likewise when you say

(19) It must be that Zayd is a writer.

its negation is not

(20) It must be that [Zayd] is not a writer.

given that both of them can be false together. Rather it is 114.5

(21) It need not be that [Zayd] is [a writer].

Likewise when you say

(22) It's impossible that Zayd is a writer.

its negation is not the sentence

(23) It's impossible that Zayd is not a writer.

since (23) and (22) can be false together. Rather the negation of (22) is the sentence

(24) It's not impossible that Zayd is a writer.

[In each of the pairs]

(25) It's possible that  $p$ ; it's not possible that  $p$ .  
It has to be that  $p$ ; it doesn't have to be that  $p$ .  
It's impossible that  $p$ ; it's not impossible that  $p$ .

the two sentences can't be both true at all, and they can't be both false unless 114.10

the other conditions are met. The same holds for

(26) It's conceivable that *p*; it's not conceivable that *p*.

[2.4.9] It's plausible that 'conceivable' just means what has such-and-such properties for us, whereas the possible is what has such-and-such properties intrinsically. Also it's plausible that 'conceivable' is used with another meaning, namely that in the conceivable we consider how things are in the future which aren't yet the case in the present, whereas the possible is what is not either permanently the case or permanently not the case. Some people say that what is meant by 'conceivable' is a special case of what is meant by 'possible'. But they keep changing their mind in what they say. It's plausible too that there is some other distinction between the possible and the conceivable which I haven't remembered — there is no particular need to make an issue of chasing it down. 114.12  
114.15  
114.17

[2.4.10] We say: It's appropriate for the modality to be connected to the copula. This is because it signifies how /115/ the predicate is linked to something, either absolutely or with a universal or existential quantifier, where the quantifier indicates the quantity of the predication, so that it conditions the link. Thus when we say 114.18

(27) Every human can be a writer.

this is natural, and it means that

(28) Each individual person can be a writer.

But if [the modality] was attached to the determiner and it wasn't intended by this to stretch the language by removing [the modality] from its natural place, but rather it was intended by it to signify that the natural place for [the modality] is adjacent to the quantifier, then it wouldn't be a modality of the copula. Rather it would be a modality of the universal or existential [quantifier], so the meaning would be changed. The meaning would have become a possibility, namely that it's possible that all human beings together are writers. An indication of the difference of meaning is that nobody at all has any doubts about (27); in fact one knows that no individual human has to be permanently literate or permanently illiterate by nature. But when you say 115.5

(29) It's possible that everybody is a writer.

on the basis that the possibility is the modality of the universal quantifier, then one could doubt that the proposition is true. In fact some people say that it's impossible that everyone is a writer, i.e. that it couldn't possibly be the case that every human is a writer — so that it turned out that there was nobody at all who was not a writer. This shows that there is a testable difference between the two meanings. 115.10



[2.4.11] The two analogous cases of existentially quantified propositions run closely parallel to each other, both for what is explicit and for what is implicit. Nevertheless one can tell that there is a difference between the two meanings when one reduces to the question of what is required by the sense, making use of the universally quantified case. 115.12

[2.4.12] As for negative universally quantified propositions, Arabic has no expressions that genuinely signify the negative possible universally quantified proposition. But rather there is an expression in common use that just signifies the possibility of the negative universally quantified proposition. In this case there is some doubt whether /116/ 115.14

(30) It's possible that there is nobody who is a writer.

One might say this is can't possibly be true — the arts [of writing] would surely have to be there in some person. But we are not talking about this sentence being true or false; the art of logic gives us no information about that. Rather our aim is to distinguish between something that could be doubted and something that couldn't be doubted. What could be doubted is the possibility of the proposition that denies, for each individual [person], that he has [the skill of writing]. But Arabic only has a sentence that signifies this in the affirmative, as when people say 116.5

(31) Each individual person is possibly not a writer.

On the other hand when one says

(32) Everybody is not a writer.

then the only place where the modality of possibility could be put in this is on the quantifier, so that the meaning of the sentence would be that it's possible that everybody is not a writer. Thus it signifies the possibility of the quantifier. As for the sentence

(33) Some people — possibly they aren't writers.

it's perhaps equivalent in a way to the sentence 116.10

(34) It's possible that some person is not a writer.

though it may be different even if it follows from it, so that it is the intention in one of them that some people are described as possibly not writers, while in the second [the intention is] that the truth of the sentence

(35) Some people are [not] writers.

is possible.

[2.4.13] Now that you know how these propositions behave, when you 116.13

study the ways in which they entail each other, you must study the entailments between these quadripartite propositions with a modality on the basis that the modality on a copula is not the same as the modality on a quantifier.

[2.4.14] When that has been taken care of, the truth of the matter about [these propositions] will still not become apparent to us until we know the facts about an ambiguity in the word 'possible'. We say: The word 'possible' has an established usage in common speech with one meaning, but among philosophers today it is used with another meaning. Common people mean by 'possible' a thing that /117/ is not impossible — just that. They don't take into account whether the thing is necessary or not. Also there happen to be things of which it can be truly said that they are possibly the case and possibly not the case — in other words it's not impossible that they are the case and not impossible that they are not the case — and there happen to be other things which are possibly the case but not possibly not the case. So when the specialists found some ideas for which the possibility of being the case and the possibility of not being the case occur together [[. . .]], they reserved the name 'possibility' for this case. Thus they made the name 'possibility' refer specifically to ideas for which both kinds of possibility are true together, both the negative and the affirmative. These are the ideas that don't contain any necessity. So these specialists agreed between them to adopt the convention of using 'possible' to name those things for which it's not impossible that they are satisfied and not impossible that they are unsatisfied. In their scheme three cases occur: impossible that it is satisfied, impossible that it is unsatisfied, and not impossible that it is satisfied or that it is unsatisfied. If you wish, you can say that these are 'necessarily satisfied', 'necessarily unsatisfied' and 'not necessarily either satisfied or unsatisfied'. [[. . .]] So when 'possible' is used in its broad meaning, every idea is either possible or impossible; anything that is not possible is impossible, and anything that is not impossible is possible, and there is no other case. But when it is used in its narrow meaning, everything is either possible or impossible or necessary; it's not the case that anything that is not possible is impossible. Rather, anything that is not possible is either necessarily satisfied or necessarily unsatisfied.

[2.4.15] The specialists have gone on to agree another convention between them. They allow the word 'possible' to signify a meaning even narrower than [the narrow possibility above]. Namely, when someone talks of this kind of possibility, the content is something that is not the case [yet], but in the future it is not necessarily the case, or not [necessarily] the case at whatever time is stipulated. /118/ In later sections you will find a detailed examination of sentences which are possible in this sense. Thus there are three different meanings of 'possible', which form a hierarchy of higher and lower, with the broader above the narrower. Because of the ambiguity of the word, what [Aristotle] says can be read as referring either to the broader notion or to the narrower. The word is used of two narrower notions; one of them is a special case of the other, and the other [is narrow] by comparison with predicating the broader

notion. You already know this from the earlier discussion. The broad meaning is that the content of an idea (by which I mean the aspect of the idea that is used to make an affirmative or negative judgement about something) is not impossible. The narrow meaning is that its content is not necessary, and the third meaning is that its content has not been satisfied and there is no necessity [for it to be satisfied or not satisfied??] in the future. A thing that is satisfied but not necessarily satisfied is not included in the narrowest-possible but it is included in the narrow[-possible] and the broad[-possible]. A thing that is necessary is not included in the narrowest[-possible] or in the narrow[-possible], but it is included in the broad[-possible].

[2.4.16] Some people have landed themselves in doubts as follows: 118.8

What is necessary is either possible or not [possible]. If it is possible, and things that are possibly the case are also possibly not the case, then something necessary is possibly not the case, which is absurd. If it is not possible, and what is not possible is impossible, then something necessary is impossible, and this is absurd. 118.10

The answer that they give is word for word as follows. They say:

‘Possible’ is an ambiguous noun. It is used of what is potential, but it is also used of what is necessary. The [meaning of] ‘possible’ which is used of the necessary doesn’t include the other kind of possible; it doesn’t [include things that are] simultaneously both possibly the case and possibly not the case. Rather, it [just includes] what is possibly the case. The [meaning of] ‘possible’ that is used of the potential is that it’s true simultaneously that the thing is possibly the case and possibly not the case. Therefore not everything that can be said to be possibly the case can truly be said to be possibly not the case, since ‘possible’ applies to the necessary. Also not everything that can be said to be not possibly the case has to be impossible, since what is possible in the sense of ‘potential’ is false of the necessary, and it doesn’t have to be impossible. 118.15

[2.4.17] These people have made two mistakes. The first is that nobody says ‘possible’ meaning /119/ necessary, as if the two expressions were synonymous. It doesn’t mean necessary; it most definitely means something broader than necessary, since it is not hard to see that its application to necessary things and its application to broad-possible things are applications of a single meaning which includes both of them together. So its application to them is the result of a single meaning, not of an ambiguity. This is what I claim, unless of course they are using the word in a different way from the one we have indicated. The second thing [that they got wrong] here is that ‘potential’ is a noun with a narrower sense than the sense of ‘possible’ which we are discussing. A necessary condition for an idea to be potential is that it is not satisfied [now]. 119.5

[An idea that is] possible but not necessary is one which is not permanently satisfied and not permanently unsatisfied — so it is not hard to see that it could be either satisfied now or not satisfied [now].

[2.4.18] If someone said 119.7

(36) If it is satisfied now, then its being satisfied makes it necessarily satisfied.

then why doesn't he say:

(37) If it is unsatisfied [now], then its being unsatisfied makes it necessarily unsatisfied.

(So it would be impossible to be satisfied because it is unsatisfied.) But the kind of necessity that we are talking about is not what is necessary under some condition of time or circumstance, and the same goes for the kind of impossible that we are talking about. Rather, [we are talking about] the necessary that is the same as being permanently satisfied, and the impossible that is the same as being permanently unsatisfied. It is not the case that when an idea is satisfied, then it has to be satisfied, i.e. permanently satisfied. Rather it has to be satisfied under the condition 'for as long as it continues to be satisfied'. It persists in being satisfied for as long as it persists in being satisfied, it doesn't persist in being satisfied unconditionally. . This is quite different from what these people say. 119.10

[2.4.19] But the First Teacher already indicated the meaning which we have gone to, and so let us expound it, as is appropriate, so that you understand that his line of thought is not the way they go. He said: 119.15

“Not everything of which one says that it's possible that it is the case or walks has to have this possibility in the meaning that includes what is opposite to that, so that at the same time it can truly be said that it's possible that it is not the case. And in fact there are things such that the opposite is not true in them. In fact the things in which /120/ the possible relates to a potential that doesn't involve rationality or choice are said to be potentials and possibilities, and [their possibility] is not both for a thing and its contradictory. Rather, they are called potential and possibility, and they go in only one direction. This is if the potential is active. But if the potential is preparatory, then neither of the two things is picked out for [the potential] in itself, but rather it accepts both of the opposite things together. The other [kind of potential], the one on the 'active' side, doesn't perform both of the two contraries together. But rather if it stays inactive and there is nothing to receive it and no combining, then it is not going to act. Nevertheless the name 'possibility' is given both to the case of the active and to the case of what is preparatory for the two things. The word 'possibility' is homonymously applied both to a thing that walks when it walks, and to

120.5

what potentially walks but doesn't walk; the first is said to be 'in act' and the other 'in potency'. The [possibility] which is in act is homonymously applied both to eternal things and to changing things; the other [possibility] is limited to things that change.

You must understand that there is no need to say that by his phrase 'is said of it' he means that the [predicated] noun means the same as [the subject noun]. It would be better to think that the meaning of his phrase 'is said of it' is that the meaning is that it is a specific instance of it. It's like when a person says that 'animal' or 'white' is said of 'human', and it doesn't mean that ['animal'] is synonymous with ['human']. Rather it means that ['animal'] is predicated of ['human']. So the 'possible' that is said of things that are changeable, i.e. the one that is appropriate for them insofar as they are changeable, is not true of the necessary. As for the other way of taking 'possible', [Aristotle] uses it but he doesn't explain this way of taking it. Then he says: 120.10

But the universal is predicated of the particular, and the possible is predicated of the necessary.

By this he indicates that 'possible' has a meaning which is understood [to include] a more numerous and a broader range than the meaning of 'necessary', so it is universal in relation to 'necessary' and the necessary is a particular below it. That meaning [of 'possible'] is 'not impossible', and the necessary is a particular case of what is not impossible. 120.15

[2.4.20] When the First Teacher said this, he was moved to say: "We must be cautious what we say", referring to what he said about the things that followed in the course of raising doubts. One should know a fact about this excellent First Teacher. He had no great fondness for raising doubts that delay the investigation. He would often go through the routine of doubting, but then in the end he would go back and give the resolution. Sometimes he was careless about things where he himself had taught us the need to avoid carelessness about them. Sometimes he treats us [his readers] carelessly. So it can happen that a person studying a book of his is readily convinced by something that [Aristotle] was careless about, and is misled by the surface meaning of his views and didn't look deeper or check. Then he is taken over by a partisan commitment to how he understood the matter, without going to the heart of it, and so he comes to self-deception. And you should be aware that this excellent person often deliberately hid the truth, keeping it back so that [only] a person with the stamina to reach it at close quarters would win through to it. 121.5

[2.4.21] Now let us discuss implicationally comparable propositions. We say: When two propositions are implicationally comparable, sometimes the implication can be reversed and sometimes it can't. The comparable pairs where the implication can be reversed are those where each of the propositions has the same force as the other. The comparable pairs where the implication can't be reversed are the ones where when one of the two is posited, the other 121.9  
121.10

follows [from it], but it is not the case that whenever the other is posited the first follows from it. Thus from the sentence

(38) It is necessary that  $p$ .

there follow

(39) It is impossible that not  $p$ .

and

(40) It is not possible that not  $p$ .

and conversely. (Here the possible is broad-possible.) And from the negations of these there follows the sentence

(41) It is not necessary that  $p$ .

From the sentence

(42) It is necessary that not  $p$ .

there follow the sentences:

(43) It's impossible that  $p$ .

and

(44) It's not broad-possible that  $p$ .

and conversely. The contradictories of the two follow from the sentence 121.15

(45) It is not necessary that not  $p$ .

But no sentence in the narrow-possible group follows from any sentence in the necessary group. Here is a chart of what we have [just] said. /122/

It's not necessary that $p$	It's necessary that $p$
It's not impossible that not $p$	It's impossible that not $p$
It's broad-possible that not $p$	It's not broad-possible that not $p$
It's not necessary that not $p$	It's necessary that not $p$
It's not impossible that $p$	It's impossible that $p$
It's broad-possible that $p$	It's not broad-possible that $p$

[2.4.22] The only sentences that follow from the narrow-possible and conversely are sentences from the narrow-possible group. From 122.9

(46) It's [narrow-]possible that  $p$ .

there follows

(47) It's [broad-]possible that  $p$ .

and the contradictory of (46) follows from the contradictory of (47). The sentence 122.10

(48) It's not narrow-possible that  $p$ .

follows from the sentence

(49) It is not narrow-possible that not  $p$ .

Therefore there are six levels of implicational comparables. Each of them has consequences that are not equivalent to them. [??] Let us mention all the levels.

(Level 1) The level of 'Possible that  $p$ ' and the sentences that go with it.

(Level 2) The level of 'Not necessary'. Nothing follows from it except what entails it conversely.

(Level 3) The level of 'Necessary that not  $p$ '. The sentences that follow from it are: 122.15

It's not impossible that not  $p$     It's not impossible that  $p$

It's broad-possible that not  $p$     It's broad-possible that  $p$

/123/

It's not narrow-possible that  $p$     It's not narrow-possible that  $p$

It's not narrow-possible that not  $p$     It's not narrow-possible that not  $p$

(Level 4) The level of 'Not necessary that not  $p$ '; the only things that follow from it are the sentences equivalent to it.

(Level 5) The level of 'Narrow-possible that  $p$ ' the special. The things that follow from it:

It's not necessary that not  $p$     It's not necessary that  $p$

It's not impossible that not  $p$     It's not impossible that  $p$

It's broad-possible that not  $p$     It's broad-possible that  $p$

(Level 6) The level of ‘Not narrow-possible that  $p$ ’. There doesn’t follow from it anything equivalent to it.

## 5 Notes

[2.4.2]

112.8f *istiḥqāq* normally means ‘deservingness’ or ‘claim’. Its use here is a little puzzling. Elsewhere in this book and in *Qiyās* it occurs just once, at *Qiyās* 174.14, apparently (CHECK) in the same sense as here.

[2.4.3]

Ibn Sīnā’s account of the difference between matter and modality, with a sentence to illustrate the difference, could have been taken from any of the Alexandrian commentators; cf. Stephanus [5] 54.3–13 CHECK, p. 174. In *Iṣārāt* Method 4.1 Ibn Sīnā omits any explanation of the difference; his readers must have been completely bewildered. Tūsī’s commentary repairs the damage by using Ibn Sīnā’s own notion of *taṣawwūr* ‘conceptualisation’: the modality is part of what you have to conceptualise in order to understand what the sentence is saying, but the matter is not. This explanation survives into the modern seminary textbooks (sadly not always accompanied by any examples).

112.11 ‘when the copula is explicit’ (*muṣarraḥin bi-hā*): Reading this as an impersonal passive. I would have expected the participle form to be feminine — not masculine as here — but so far I haven’t found a grammar that discusses the point. LATER: Saad’s book is reported to discuss it. A paper on the web confirms that the participle should be masculine here.

112.12 ‘which is also known as the “element”’: This looks like an unintelligent marginal note by somebody who knew (e.g. from Al-Fārābī *Hurūf* [2] para. 156, p. 159) that the Greek word *stoikheion* ‘element’ (i.e. fire, water etc.) was sometimes translated as *‘unṣūr* ‘element’ and sometimes as *mādda* ‘matter’. But maybe there is a better explanation.

112.12 ‘inherent’ (*fī nafsih*): The point is that the matter is the actual relation, not something said about it (which could be false, like the statement of modality).

112.12f ‘affirmative’, ‘the way it is true [of the subject]’: The phrasing is crabbed, and these two phrases seem to be expressing the same thing. (In fact two manuscripts omit ‘affirmative’.) Perhaps the second was added as a clarification of the first, either by Ibn Sīnā himself or by a later reader. OR ELSE: The ‘affirmative’ means that for



example the sentence ‘Every human is possibly not a writer’ is affirmative, because of the ‘possibly’. He makes a few remarks of this sort later. For example 113.9.

[2.4.4]

113.2 ‘two places’: In fact Ibn Sīnā himself very often attaches the modality in neither of these places, but at the end of the sentence, after the predicate. EXAMPLE. He could be using this position to indicate that the modality is not explicit in the sentence. CHECK THIS FROM EXAMPLES.

113.5f ‘Some person can be a writer’: Perhaps more literally ‘Some person — (s)he can be a writer’. This is an example of the Arabic *mubtada’-kabar* construction, which Ibn Sīnā consistently uses in order to identify the subject of subject-predicate sentences. REF The construction is usually taken to be a topic-comment construction with the *mubtada’* as the topic. Ibn Sīnā uses the *mubtada’* for the subject, which is fine when the subject is linguistically definite (‘The person’, ‘Everybody’ for example). But when the sentence is existentially quantified as here, the *mubtada’* is linguistically indefinite and doesn’t make a convincing topic. The classical Arabic linguists knew examples of indefinite *mubtada’* but regarded them as substandard (REFS).

[2.4.5]

113.9 ‘looks like an affirmative proposition’: The fact that it looks like an affirmative proposition owes more to Ibn Sīnā’s criterion for affirmativeness than it does to any fact about Arabic. Since the modal verb attaches to the negated predicate, it forms a kind of compound predicate ‘can fail to be a writer’. This compound predicate is asserted of the subject ‘Everybody’, so the proposition is affirmative.

Contrast with English. The English modal verb ‘can’ behaves like an auxiliary verb, and in particular we negate it by putting the negation *after* it (as used to be the case with all verbs in Middle English). Thus ‘can’t be a writer’ is the negation of ‘can be a writer’; it doesn’t mean ‘can not-be-a-writer’. If he had been talking about English, Ibn Sīnā could have fairly made the linguistic point that English doesn’t allow us to negate ‘can write’ by putting ‘not’ in front of ‘write’. (See Palmer [13] p. 9.) But there is no such problem with Arabic. In fact the Arabic that we translate as ‘can fail to be a writer’ is exactly the same as the Arabic for ‘can be a writer’ but with a negation added in front of ‘be a writer’.

113.11 Presumably this counts as affirmative too, if 113.9 did. Also this sentence has an indefinite *mubtada’*, like 113.5f.

[2.4.6]

113.11 ‘we will consider’: See 114.18ff below.

[2.4.7] The purpose of this paragraph is to establish that the scope of a negation is what follows it in the sentence; Ibn Sīnā will apply this in the next sentence. He should perhaps have made it clearer that he is talking specifically about Arabic — he was well aware that word order can vary from one language to another REF. The point is true for Arabic without any interesting exceptions, and as far as I know CHECK it’s true for his other language Persian too. But for example in Bengali a sentence is negated by putting *na* at the end. (You can confirm this without knowing any Bengali, by noticing the large number of sentences in any Bengali text that finish with the symbol SYMBOL.)

[2.4.8]

114.11 ‘the other conditions’: I DON’T KNOW WHAT THESE ARE.

[2.4.9]

114.12 ‘for us’: The modern literature contains the idea that epistemic modalities are related to the attitudes of the speaker, while the alethic modalities are not. Palmer [13] p. 10 suggests that this difference can be accounted for if there is a performative element in the epistemic modal expressions. But it’s not clear to me what performative element there could be in *muḥtamal* ‘conceivable’.

[2.4.10]

115.1 Perhaps the point here is that since both the modality and the quantifier express conditions on the relation between subject and predicate, it doesn’t make sense to regard the modality as conditioning the quantifier.

115.4 ‘stretch the language’ (*tawassu<sup>c</sup>*): The word literally means ‘expansion’. The classical linguists used it to mean the use of a word in an extended sense; see Gully [6]. But here Ibn Sīnā applies it to using a construction in a loose form.

115.9 ‘the universal quantifier’: The text reads ‘the universal and the quantifier’.

115.11 ‘testable difference’ (*furqān*): *furqān* is a Qur’anic word, generally taken to mean a criterion for distinguishing between truth and falsehood (*Qur’ān* 25.1). It doesn’t appear elsewhere in Ibn Sīnā’s logical writings.

[2.4.11] Take for example the sentence ‘Somebody assassinates Ronald Reagan’. Then the two cases analogous to the universally quantified examples will be  
(50)  
There is a person who can assassinate Ronald Reagan.

and  
(51)  
It’s possible that there is someone who assassinates Ronald Reagan.

Ibn Sīnā says that by following the universally quantified case we can show that these two sentences mean different things. I guess that he would accept the following. Suppose there are no humans at all. (We know he regards this as possible; REF.) Then (50) is false but (51) is true. (But I would be happier if I knew what argument he would accept to show that (51) is true in this case.)

[2.4.12]

115.15 ‘possibility of the negative universally quantified’: Reading *‘imkāni l-salbi l-āmmi*, as required by the example.

[2.4.13]

Some of the readings here are very forced, as if Ibn Sīnā put *laysa* into the heart of the sentence. ANALYSE THIS.

116.7 Here he states without reservation that a compound term ‘possibly not an X’ is affirmative.

116.9 Another indeterminate *mubtada’*.

116.11 ‘even if it follows from it’: If Ibn Sīnā means that (33) follows from (34), then as Movahed [12] notes, this is the Barcan formula.

116.12 Read *laysa ba<sup>c</sup>du l-nās*, as in two manuscripts.

[2.4.14]

117.5f Omit *a<sup>c</sup>nī l-imkāna l-āmmī* ‘i.e. broad possibility’. Ibn Sīnā will define the difference between broad possibility and narrow possibility in lines 117.13f below. The possibility referred to in the present line is in fact the narrow one, not the broad.

117.11f Omit *wa-ma<sup>c</sup>nā l-ḍarūrī l-dā’im mā dāma l-mawṣūf bihi mawjūda l-dāt, alā mā sa-naṣraḥ ḥādā fī mawḍi<sup>c</sup>in āharin bil-tahqīq* ‘The meaning of “necessary” is what persists for so long as the description is satisfied in its essence, as we will explain precisely in another place’. This remark breaks the continuity of the passage. Also it’s logically incompetent: the required essence is not that of the description, but

that of an individual falling under the description. (When we say ‘Humans are rational’, we mean that each human is rational for so long as that human exists, not for so long as [HUMAN] is satisfied. Cf. *Qiyās* i.4 REF.) The interpolation shows that Ibn Sīnā’s notion of temporal necessity was misunderstood from early times. Also it illustrates that interpolators sometimes claim to be Ibn Sīnā himself; there are other examples of this at line 117.5 above and at *Qiyās* ix.REF for example.

[2.4.16]

- 118.8 *‘alā anfusihim*: also at *Qiyās* 135.12, 138.17. The meaning seems to be like the English idioms ‘saddled themselves with’ and ‘brought it on themselves’.
- 118.18 ‘false of the necessary’: In other words the sentence ‘The necessary is not possible’ is true in this sense of ‘possible’.

[2.4.17]

- 119.3 Al-Fārābī 187.26 = Zimmermann [15] p. 181 l. 7 does say that ‘possible’ shares three of the meanings of ‘necessary’ and has a fourth meaning. From the context it’s clear he means that ‘possible’ applies in the three cases where ‘necessary’ applies, and also in a fourth case. But it was careless to suggest that the cases are separate meanings, and he lays himself open to Ibn Sīnā’s objection. (However, Al-Fārābī’s text doesn’t contain anything like what Ibn Sīnā describes as a ‘word for word’ quotation, so he is probably not Ibn Sīnā’s target here.) I MUST CHECK how Al-F and Ibn Sīnā respectively distinguish between a word applying in several cases and a word having several meanings.
- 119.4 ‘This is what I claim’: This feels wrong for the context. Is there something amiss in text or translation?

[2.4.18]

- 119.13 ‘under the condition’: This is not Ibn Sīnā’s happiest piece of exposition. If he means that it’s not  $p$  but ‘ $p$  whenever  $p$ ’ that is necessarily true, then on his own principles he should have put the ‘Necessarily’ at the beginning of the sentence. If he means that whenever we assume that  $p$  we commit ourselves to  $p$ , he could certainly have explained it better. (As it is, I don’t know what point he is making.)

[2.4.19]

This paragraph paraphrases Aristotle *De Interpretatione* 13, 22b36–23a18 CHECK; the Arabic is in [11] p. 155 l. 2 to p. 156 l. 11.

- 119.16 ‘everything that’: Read *kullu mā*, as in several manuscripts and in the IDENTIFY translation of Aristotle’s *Peri Hermeneias* [11] p. 115 l. 2.
- 120.5 ‘there is nothing to receive it’: Ibn Sīnā is making a rather clumsy précis of Aristotle. Presumably the point here is that although fire potentially burns and can’t help burning things that it touches, it won’t burn anything if there is nothing that receives (*qābil*) it and combines with it. Confusingly Ibn Sīnā has just used *qābil* for potentials that ‘receive’ (i.e. allow) both acting and both not acting.
- 120.8 ‘homonymously applied’: Ibn Sīnā appears to have shot himself in the foot here. Aristotle had said that ‘possible’ is ‘homonymous’ (*muštarik* in the Arabic version in front of Ibn Sīnā) in that it is used both for the case ‘can do’ and the case ‘can acquire the skill of doing’, and Ibn Sīnā might well agree that these are two different senses of ‘possible’. But here Ibn Sīnā has put into Aristotle’s mouth the further claim that things that are permanent (or as Ibn Sīnā often says, necessary) are ‘possible’ in a different sense from things that aren’t. This was precisely the view that Ibn Sīnā criticised above at REF.
- 120.9f ‘is said of it’ (*yuqālu ‘alayh*): Here Ibn Sīnā shoots his other foot too. The phrase *yuqālu ‘alayh* occurs neither in the translation of this section (13) of the *Peri Hermeneias*, nor in Ibn Sīnā’s paraphrase.

[2.4.20]

- 121.1 ‘we must be cautious what we say’: Ibn Sīnā is putting words into Aristotle’s mouth. He is probably referring to Aristotle’s remark at *Peri Hermeneias* 23a20f: ‘One should look at the others as following from these’. The Arabic translation reads ‘Then it’s appropriate that we reflect on (*nata’ammal*) how the things entailed by these other remaining ones go’.
- 121.8 ‘at close quarters’: See Gutas [7] pp. 225–234 on the practice of ‘withholding knowledge’, and Bertolacci [4] p. 405f on that practice as described in this passage. The translation assumes that the intention ascribed to Aristotle is that only people with the mental capacity to fight through to something close to the truth will be able to understand him. A less likely reading is that Aristotle himself intends to bring his readers ‘close’ but only so close that the best intellects will be able to go the rest of the way.

[2.4.21]

- 121.9 ‘implicationally comparable’ (*mutalāzim*): The word may be Ibn Sīnā’s own invention, but he fails to define it. It appears again at *Išārāt*

Method 4.9, again with no explanation; nor does Tūsī clarify it in his commentary. From the form of the word we can infer that it expresses an equivalence relation connected with implication. The guess ‘logically equivalent’ is refuted by Ibn Sīnā’s statement below that two *mutalāzim* sentences need not entail each other. The next best guess is that two sentences are *mutalāzim* if at least one of them entails the other. Ibn Rušd confirms this guess at his *‘Ibāra* [8] 105.6 (‘They are *mutalāzim*, i.e. the weaker of the two follows from the stronger.’) An equivalence class under the relation of both-ways implication is called a ‘level’ (*ṭabaqa*); elsewhere Ibn Sīnā uses *muṭābiq* (literally ‘in correspondence with’) for two expressions that imply each other.

- 121.12 ‘and conversely’: In fact the converses fail if the modalities are taken ‘on the predicate’ rather than ‘on the quantifier’. The reason is that an affirmative sentence with an empty subject is false, while a negative sentence with an empty subject is true. By \*\*\* above, a predicate that starts with a modality is affirmative, so that (39) is affirmative, but (40) is presumably negative.
- 121.13 Should it be *yalzamuhā*?
- 121.16 Delete *wa-l-mumtani<sup>c</sup>u mun<sup>c</sup>aqisan<sup>c</sup> alayh* (unless some sense can be found for it).

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