Missing Modes of Supposition

′1 The Modes of Common Personal Supposition

Supposition theory is a medieval account of the semantics of terms as they function in sentences. The word >supposition= is probably interchangeable with our word >reference=, but I=ll leave it as >supposition= so as to identify the medieval source of the theory I discuss here. Medieval writers had a great deal to say about supposition; this paper focuses on only one part of the theory, the study of what is now generally called the theory of modes of common personal supposition. The word >common= is used here as in >common term=, as opposed to >singular term=, but in fact, the theory focuses on common terms along with the quantifiers that accompany them. The word >personal= is a technical term indicating that the word in question is used in its normal way to refer to the things it is true of, as distinguished from occurrences in which it refers to itself (as in >Giraffe is a noun=) or refers to a particular thing intimately related to the things it is true of (as in >Giraffe is a species=). So we might describe this as a theory of the modes of reference of quantified common terms used normally. There are three such modes, illustrated as follows:

DETERMINATE: The term >dingo= has determinate supposition in:

Some dingo is a predator.

Determinate supposition has something to do with existential quantification. Exactly what it has to do with existential quantification is a question to be discussed.

DISTRIBUTIVE: The term >dingo= has distributive supposition in:

Every dingo is an animal.

Distributive supposition has something to do with universal quantification.

MERELY CONFUSED: The term >dingo= has merely confused supposition in:

Every predator is a dingo.

Merely confused supposition has something to do with existential quantification that occurs within the scope of a universal quantification.

Among twentieth century commentators, the major outstanding questions regarding the theory of the modes of common personal supposition are:

What is it a theory of?

What is it intended to accomplish?

This paper addresses only the first question: what is the theory of modes of common personal supposition a theory of?[1]

'2 The Fourteenth Century Theory

Following Spade (1988), I see two quite different accounts of personal supposition, an early account and a later one. The early account is found in the late twelfth and thirteenth centuries in the writings of Peter of Spain, William Sherwood, Lambert of Auxerre, and several anonymous theorists.[2] I see this account as an (obscure) account of quantification. A term has determinate supposition, essentially, if it is existentially quantified; it has distributive supposition if it is universally quantified; and something a bit more complicated needs to be said about merely confused supposition. I will not be talking about this early account at all.

In the fourteenth century a new account was developed by Walter Burley, William Ockham, John Buridan, Albert of Saxony, and others.[3] It replaced the obscurity of the earlier account with clarity, relatively speaking. It also changed it into a different theory. At least that is what I have claimed in the past (following Spade (1988) in general, though not in detail), and that is part of the theme of this paper: what is the fourteenth century theory of the modes of personal supposition a theory of?

First we have to see what the account is. Here is Ockham=s version,[4] which is very close to versions given by Burley, Buridan, and Albert. The theory itself consists of three definitions; they give necessary and sufficient conditions for a term=s having determinate, distributive, or merely confused supposition. Beginning with determinate:

> $ A term F has determinate supposition in a proposition S if and only if
>
> > [Descent]: you may descend under F to a disjunction of propositional instances of all the F=s, and
> >
> > [Ascent]: from any such instance you may ascend back to the original proposition S.

A Apropositional instance@ of a proposition with respect to F is the proposition you get by replacing the denoting phrase containing F with one of the form >this F= or >that F=.[5]

ADescent@ and Aascent@ are simply valid inferences, picturesquely expressed in terms of the directions in which the inferences go. So we validate the claim that >dingo= has determinate supposition in >Some dingo is spotted= by establishing these two claims:

> DESCENT: You may descend under >dingo= in >Some dingo is spotted= to a disjunction of instances of all dingo=s. That is, from:
>
> > Some dingo is spotted
>
> you may infer:
>
> > This dingo is spotted <u>or</u> that dingo is spotted <u>or</u> . . . and so on for all the dingos.
>
> ASCENT: You may ascend back to the original proposition, because from any instance of the form:
>
> > This dingo is spotted
>
> you may infer the original proposition:
>
> > Some dingo is spotted.

Distributive supposition has a parallel explanation:

> $ A term F has distributive supposition in a proposition S if and only if
>
> > [Descent]: you may descend under F to a conjunction of propositional instances of all the F=s, and
> >
> > [Ascent]: from any one instance you may not ascend back to the original

proposition S.

So >dingo= has distributive supposition in >Every dingo is spotted= because

DESCENT: You may descend under >dingo= in >Every dingo is spotted= to a conjunction of instances of all dingo=s. That is, from:

Every dingo is spotted

you may infer:

This dingo is spotted <u>and</u> that dingo is spotted <u>and</u> . . . and so on for all the dingos.

ASCENT: You may not ascend back to the original proposition; from an instance of the form:

This dingo is spotted

you may not infer the original proposition:

Every dingo is spotted.

Finally, merely confused supposition:

$ A term F has merely confused supposition in a proposition S if and only if

[Descent]: you may not descend under F to either a conjunction or a disjunction of propositional instances of all the F=s, but

You may descend to a disjunctive term, and

[Ascent]: from any instance you may ascend back to the original proposition S.

The term >mammal= has merely confused supposition in >Every dingo is a mammal= because:

DESCENT: You may not descend under >mammal= in >Every dingo is a mammal= to either:

Every dingo is this mammal <u>and</u> every dingo is that mammal <u>and</u> . . . , and so on for all the dingos.

or to:

Every dingo is this mammal <u>or</u> every dingo is that mammal <u>or</u> . . . , and so on for all the dingos.

But you may descend to a disjunctive <u>term</u>:

Every dingo is this-mammal-or-that-mammal-or-that-mammal . . . , and so on for all the mammals.

ASCENT: You may ascend back to the original proposition from any instance. From:

Every dingo is this mammal[6]

you may infer the original proposition:

Every dingo is a mammal.

'3 Modes are Kinds of Global Quantificational Effect

The definitions of the modes of common personal supposition look something like twentieth century truth conditions for quantifiers, though for restricted quantifiers like >every dingo= instead of for >every thing= or >everything=. This led some twentieth century authors[7] to suggest that the descended forms are meant to provide truth conditions for the quantifiers occurring in the original forms. But this is not right, for two reasons. First, as was noted decades ago, e.g. in Matthews (1964, 1973, 1984), the descended forms are not equivalent to the original forms; they follow from the original forms, but in the case of distributive supposition, for example, the descended forms do not always entail the originals.[8] And so they cannot be analyses. The second reason, bears on the topic of this paper. I=ll begin explaining it by using a modern parallel. Suppose we ask what the sign ‘$\exists x$= is doing here:

$$\exists x Px$$

An accurate answer is: It=s an existential quantifier. It makes a sentence that is true if the part following the quantifier is satisfied by at least one thing.

Now let us ask what the sign ‘$\exists x$= is doing here:

$$\neg\exists x Px$$

One natural response would be:

> <u>Response #1:</u> We already answered that question: it=s an existential quantifier. The negation sign doesn=t change that answer. The quantifier behaves as we said above, and the negation reverses the truth value of the resulting sentence.

That response is correct. But so is this response:

> <u>Response #2:</u> In this context the sign is, in effect, a <u>universal</u> sign. It makes the sentence

true if the part of the sentence without the quantifier - - namely, this part:

$$\neg Px$$

(the part with the quantifier removed) - - is satisfied by everything.

That response is also correct. The first response is a part of a typical twentieth century theory of quantifiers; it explains what quantifiers do locally. (This is like the earlier, thirteenth century account.) It analyses sentences modularly, with bigger modules produced from smaller ones; you analyze how quantifiers behave in their own local modules, and a recursive semantics takes care of the rest. The second response looks at quantifiers in terms of their global context, and says what they do to their global context - - including parts of that context, such as the negation sign above, that are not even within the scope of the quantifier. You <u>can</u> look at things this way. What you get is a theory of what I call <u>global quantificational effect</u>. It=s the effect a quantifier <u>actually</u> has, described in terms of the effect it <u>would</u> have if it had scope over the whole global context, or almost the whole context.

This idea can be made precise within the theory of "prenex normal forms". If no biconditional sign appears in a formula of quantification theory, then you can take any quantifier in that formula and move it in stages toward the front of the formula, each stage being equivalent to the original formula, provided that you switch the quantifier from universal to existential (or <u>vice versa</u>) whenever you move it past a negation sign or out of the antecedent of a conditional, and provided that you do not move it past a quantifier of opposite quantity (i.e. you don't move a universal past an existential, or <u>vice versa</u>). For example, you can take the universal quantifier in:

$\neg(Gy \rightarrow \forall xPx)$

and move it onto the front of the conditional to get:

$\neg\forall(Gy \rightarrow Px)$,

and then the resulting universal sign can be moved further front, turning into an existential:

$\exists x\neg(Gy \rightarrow Px)$.

This chain of equivalences can be interpreted as the <u>movement</u> of a single quantifier to the front, retaining its identity while changing its quantity.[9] If you do this systematically to all the quantifiers in a formula, the result is a formula in "prenex normal form," in which the quantifiers are all on the front in a row, each of them having scope over the rest of the formula to its right. In terms of these prenex forms you can define the <u>global quantificational effect</u> of any quantifier in any formula: when it moves to the front it ends up being either universal or existential, and it may or may not be able to move to the front of all the <u>other</u> quantifiers in the sentence.

Let us take this idea and use it to analyze the terminology of supposition theory. The subject matter here is terms, not quantifiers, but each term comes with its own quantifier, so we can treat the theory as if it is a theory of restricted quantification. We then give this account:

> A term is <u>determinate</u> in a formula if it becomes a wide scope existentially quantified term in (one of) the prenex normal form(s) of that formula.

> A term is <u>distributive</u> in a formula if it becomes a universally quantified term in (one of) the prenex normal form(s) of that formula.

A term is merely confused in a formula if it becomes an existentially quantified term in (one of) the prenex normal form(s) of that formula, but it can=t get wide scope in any such form.

Illustration: Let us test >dingo= for its mode of supposition in >Some dingo is a predator=. Using well-known symbolizations for categorical sentences in modern notation, we see that >dingo= has determinate supposition here, because it is already in prenex form, existentially quantified:

Some dingo is a predator

(for some dingo x)(for some predator y)[x is y]

It has distributive supposition here, for the same reason:

Every dingo is a predator

(for every dingo x)(for some predator y)[x is y]

The term >predator= in the sentence just displayed has merely confused supposition because it is existentially quantified with scope inside that of >for every dingo=, and it cannot be moved further to the front preserving equivalence.

Now consider:

Some predator is not a dingo

(for some predator x) not (for some dingo y)[x is y]

Here the >not (for some dingo y)= is equivalent to >(for every dingo y) not=, yielding:

(for some predator x) (for every dingo y) not [x is y]

The original >some dingo= has now become universal, thus classifying it as having distributive supposition, which is the mode that the theory described in terms of ascent and descent says it has. This illustrates the importance of looking at things globally; although >dingo= is existentially quantified here, it has universal effect. For example, you could Auniversally specify@ it. This is why it is classified in this theory as distributive.

These are simple examples; as the sentences get more complex, so do the examples. To be sure how it all works, you need to develop a precise syntax and define these notions carefully. For the rest of this paper I will take for granted that the theory of ascent and descent and the theory of these prenex normal forms is clearly worked out;[10] this should not be problematic for the simple examples discussed here.

Taking this for granted, the thesis to be examined is that the later theory of supposition, explained in terms of ascent and descent, is a theory of global quantificational effect, a theory that can be made precise in a mechanical way in terms of the theory of prenex forms for quantifiers.

′4 Gaps in the Accounts?

In Parsons (1997) I argued that textual evidence supports the claim that the fourteenth century theory of supposition is essentially a theory of global quantificational effect (and that the thirteenth century theory is different, more like our modern recursive theories of quantifiers). But two issues (not discussed there) threaten this conclusion. Each has to do with gaps in the accounts.

Gap #1: First, there is a problem about the prenex normal forms alluded to above. In the predicate calculus with unrestricted variables, any quantifier not in a biconditional moves into prenex form as described. But the medieval theory uses restricted quantification; instead of >for every x=, or >for every thing x=, one has >for every dingo x=. And in the restricted version of quantification theory the version of the prenex normal form theorem I have alluded to does not hold. It holds for some occurrences of restricted quantifiers, but not for all. For example, in this disjunction:

Snow is white _ For some dingo x: x is spotted

you cannot move the >for some dingo= so as to have scope over the whole disjunction, as in:

For some dingo x:[Snow is white _ x is spotted].

This is because if there are no dingos, the former is true and the latter false.[11] This means that there are terms for which the notion of global quantificational effect is not defined. There are terms that do not have global quantificational effect. This is the first gap in the account.

Gap #2: Looking at the medieval theory of ascent and descent, there is a similar problem.

Here too, not all terms fit the definitions of the modes. If the modes are defined as above, there are terms that <u>do not have</u> any mode of supposition at all. (Examples will be given below.)

I suppose you can see what is coming. Perhaps the gap in the one account matches the gap in the other account? That is a thesis to be explored of this paper: <u>the gaps match</u>. This requires qualification, since (i) there was not one theory of supposition; each author had his own version, and (ii) there are a number of details that need to be worked out in all the accounts. I will consider specifically whether it is possible to formulate a theory of supposition that is very close to Ockham=s account (and also close to the accounts of others, a kind of compromise version) that is equivalent to an account of global quantificational effect. A rigorous formulation will not be given here; the point of this paper is rather to explain what the issues are as clearly as possible without getting bogged down in details. For the remainder of this paper I will talk almost entirely in terms of the medieval theory of ascent and descent, returning specifically to the issue of global quantificational effect in the last section.

′5 Terms with no Mode of Supposition

In order to investigate the accounts in a manageable fashion, we need to limit the domain of applicability in a clear way. So for the time being, I exclude plural terms, and I consider only the quantifier words >every=, >some=, and >no= and their synonyms. I also for the time being ignore all examples containing non-extensional contexts. Even within these strict limits, the modes of supposition are not complete.

Let us look at a term with no mode of supposition. Consider the term >human= in the following simplification of a sentence from William of Sherwood:[12]

Every thing that sees every human is running,

If you represent this sentence in terms of restricted quantifiers in predicate calculus notation, the step to any kind of prenex position for the second >human= is blocked. The term cannot be moved into a prenex position.[13] And if you test for mode of supposition by appeal to ascent and descent, it has no mode of supposition either. It is not determinate because the ascent condition fails:

The original sentence:

Every thing that sees every human is running

is not entailed by

Every thing that sees this human is running.

This is because the original sentence is affirmative, and so its subject has existential import; the sentence cannot be true unless there is a Athing that sees every human@. But this is not guaranteed by the truth of >Every thing seeing this human runs=.[14] The term is not distributive because descent to an arbitrary conjunction of singulars fails:

The original sentence does not entail:

Every thing that sees this human is running and every thing that sees that human is running and . . . and so on for all humans.

Finally, the term >human= is not merely confused, because both the ascent and descent conditions for merely confused supposition fail.

Thus there are common terms suppositing personally that have no defined mode of supposition. Yet this is not a possibility that is discussed by any author at all before 1370, so far as I know. (I rely here on Read (1991).) So perhaps we might be mistaken, either in articulating the theory or in applying it. The question of whether the modes are complete has been discussed quite a bit in recent literature, and there are some suggestions along these lines that should be considered. I will discuss three of them.

Suggestion 1

One obvious idea to consider is that we should not try to assign supposition to terms that are parts of other terms. If the theory is not intended to apply to terms that are parts of larger terms, then perhaps there is no gap in the theory <u>so far as its intended application is concerned</u>.

Spade (1988) shows that the modes of supposition are complete (there are no gaps) for a certain class of sentences. Spade is liberal in what he takes to be the scope of the theory, but not libertine. One of his constraints is that the terms for which supposition is to be defined obey what he calls the Arule of scope@: that the scope of that term=s denoting phrase extends to the end of the whole proposition under consideration. Terms that occur within other terms violate this constraint, and the test case we are discussing is one of these: >every human= in >Every thing seeing every human runs= is part of the complex term >thing seeing every human=, and its scope is limited to the relative clause.

However, in practice authors did not stick to this constraint. Examples exist throughout the tradition of discussions of terms that violate it. They include:

<u>Dialectica Monacensis</u>:[15]

>Every[thing] seeing <u>every human</u> runs=.

Sherwood:[16]

>Every human who sees <u>every human</u> is running=

Buridan:[17]

>Seeing <u>any/every ass</u> is an animal=,

Paul of Venice:[18]

>Seeing <u>every human</u> is an animal=,

>A donkey of <u>any human</u> runs=

>A donkey of <u>no one</u> is an animal=.

These discussions are mostly not accompanied by a classification of terms with regard to their modes of supposition, so there is room for debate over intent. But Buridan clearly means to discuss supposition of terms that violate the rule of scope. In discussing the sentence:

An animal which is not a human is a substance

he says that >human= has distributive supposition.[19]

Notice that if we apply the tests of ascent and descent to >human= in >An [= some] animal which is not a human is a substance= they classify it as having distributive supposition, as Buridan says. So at least some terms that violate the rule of scope were assigned supposition, and the theory of ascent and descent does naturally apply to them. (Even if such terms had not been discussed it would be interesting to ask what the theory could have said about them.)

Suggestion 2

Several twentieth century authors (motivated in part by Geach (1962)) have speculated about a missing Afourth mode@ of supposition. The speculation is prompted by a lack of symmetry among the extant modes. We have descent to a disjunctive proposition, descent to a conjunctive proposition, and descent to a disjunctive term, but no descent to a conjunctive term. Perhaps that is what needs to be provided to fill the gap we are discussing. In fact, this proposal seems to work beautifully for the example we are discussing. For you can descend in our example from:

Every thing seeing every human runs

to:

Every thing seeing this-human-and-that-human-and-that-one-and-so-on, runs.

However, the proposal to complete the modes by adding descent to a conjunctive term only continues a slippery slope. This is because the proposed fourth mode does not complete the modes either. Consider this example:

Every thing not seeing a dingo runs.

The occurrence of >dingo= in this example is not determinate because descent fails to the disjunction:

Every thing not seeing this dingo runs or . . .

It is not distributive for the same reason. And it is not merely confused because ascent fails: an instance of the descended form:

Every thing not seeing this dingo runs

does not entail that there is a thing not seeing any dingo, and thus the existential import for the original proposition is not guaranteed. Finally, the fourth mode under discussion does not apply either, because one cannot descend to a conjoint term. Such a descent would produce:

Every thing not seeing this-dingo-and-that-dingo-and-that-one-and-so-on, runs,

and this is a synonym of >Every thing not seeing every dingo runs=, which does not follow.[20]

So the popularly suggested fourth mode does not fill the gap.

Suggestion 3

Read (1991) discusses an idea pursued by John Dorp to avoid this consequence. It is an attempt to avoid having to posit a fourth mode in addition to the standard three. Dorp suggests that if a proposition does not pass any of the tests under consideration as worded, then we need to find an equivalent form of the proposition containing the same terms, and test for its mode of supposition in the equivalent form. He thinks that this may capture the recalcitrant cases. For example, although one may not descend to a disjunctive term under >human= in >No animal is every human=, one can do so in the equivalent >Every animal some human is not= {Omne animal homo non est}, thereby showing that >human= has merely confused supposition in the original proposition.

This is an enticing idea, but it is not clear whether it works. First, it seems to be based on the principle that terms must have the same supposition in equivalent propositions containing them. But there are counter-examples to that principle. Consider the sentence:

Every animal is an animal.

From the medieval perspective there are two equiform terms here, one in the subject and one in the predicate. The first has distributive supposition, and the second has merely confused supposition.[21] Now consider the proposition you get when the terms are interchanged. The terms have each switched supposition, but the new proposition is equivalent to the original. So we cannot assume that a term has not changed supposition merely because the new proposition is equivalent to the old.

This consideration may not be persuasive, since it seems to be a rather special case, unlike those that Dorp had in mind. Maybe the idea works when no term is repeated? I am not sure.

The more important problem with this proposal is that it is a speculation that every term will receive one of the three modes of supposition by finding an equivalent form that passes the tests of ascent and descent. I don=t know how to do this for >human= in our test example:

Every thing seeing every human runs.

I have no proof that it cannot be done, but I am doubtful.

I think it is a mistake to focus on descents to disjoint or conjoint terms. In ordinary extensional contexts, >some A= is always equivalent to >this A or that A or that one, . . .=, and >every A= is always equivalent to >this A and that A and that one, . . .=, and >no A= is always equivalent to >every A not=.[22] So some kind of local descent of this kind is always possible in extensional contexts. It indicates only that the term is singular and occurs in an extensional context. Requiring any particular kind of descent C to a disjoint, or a conjoint, term C would be logically capricious. Since this is so, it is better ignored altogether for purposes of the present discussion. We should instead take the explanation of the modes of common personal supposition and do with them what Buridan and Burley both did: omit the condition in merely confused supposition that requires descent to a disjoint term. The simplified condition then becomes:

$ A term F has merely confused supposition in a proposition S if and only if

[Descent]: you may not descend under F to either a conjunction or a disjunction of propositional instances of all the F=s, but

[Ascent]: from any instance you may ascend back to the original proposition S.

This automatically takes care of Dorp=s example, >No animal is every human=, without having to rephrase it; >human= automatically has merely confused supposition by the definition, because no descent is possible, and ascent is possible from any instance. If we make this modification, then so far as I can see the modes of common personal supposition correspond to the kinds of global quantificational effect discussed earlier. The gaps remain unfilled, but the gaps that we have surveyed so far in supposition theory appear to match those in the theory of global quantificational effect.

'6 Completing The Modes

Suppose that modes of supposition <u>are</u> kinds of global quantificational effect, corresponding to positions in prenex normal form. Then there cannot be any more modes than the original three. This is because the modes correspond to

> wide scope existential,
>
> any scope universal, and
>
> non-wide scope existential.

But there are no more options than these. So the modes must be complete. And if some terms have no mode, then it is in principle impossible to change this. No modes are missing, but there are terms without modes. So if there are terms that are not classifiable in these ways, as I have argued, they cannot be assigned new modes without changing the idea of mode of common personal supposition to something quite different in kind.

But suppose one <u>is</u> willing to Achange the subject,@ by allowing modes that do <u>not</u> correspond to kinds of global quantificational effect. Then it is easy to complete the modes. In fact, it has already been done, by Buridan. This is because Buridan defines merely confused supposition in such a way that it simply means Aneither determinate nor distributive@.[23] All terms used personally now have one of the modes, because any term not passing the tests for determinate or distributive supposition goes into the official leftover category merely confused. So I was not accurate in saying that Buridan=s theory is a theory of global quantificational effect, because the leftover category includes all the rest.

However, even Buridan is uneasy about this. He goes on to note that terms classified in his leftover mode are of two sorts: the sort we thought we were discussing, and ones of a quite different kind. He says:[24]

> The verbs >to know=, >to comprehend=, >to understand=, and many others . . . confuse without distributing the terms following them which terminate their action.
> For example, if I say AI know a triangle@ it does not follow that therefore I know an isosceles triangle or I know an equilateral triangle, and so on. So too AI owe you a horse@ does not entail that therefore I owe you Brunellus, or I owe you Favellus, and so on.
>
> It seems to me that this kind of confusion is quite different from the preceding modes, although they are each called >confusion without distribution=.

(He goes on to discuss a number of ways in which these examples with nonextensional contexts differ from others.)

The problem of completing the modes by making the third mode a grab-bag, including all other ways in which terms with personal supposition may function, is that it lumps together quite unlike phenomena. In particular, it lumps together the terms I have been discussing that lack global quantificational effect because of their quantificational scope with terms that lack global quantificational effect because they are in opaque contexts.

I think it is possible to provide a maximally refined classification of the modes of functioning of terms with common personal supposition, using only ingredients of the medieval theory of ascent and descent. This classification will cut at the joints, in a way that Buridan=s does not. Recall our temporary restriction from above, where we excluded plural terms, and we limited consideration to the quantifier words >every=, >some=, and >no= and their synonyms, occurring in extensional contexts. Call terms occurring in such restricted contexts Aordinary@. Then consider the following categories. There are six categories: four categories of terms that have prenex positions, a category for ordinary terms without prenex position, and a sixth category for non-ordinary occurrences of terms. They go as follows, with the understanding that each entry below presupposes that the conditions for the higher entry have not been met. >GQE= abbreviates >Global Quantificational Effect=.

DETERMINATE: Existential wide scope GQE.

Descent to and ascent from a disjunction of propositional instances.

Example: >Some <u>dingo</u> is a predator=

STRONG DISTRIBUTIVE: Universal wide scope GQE.

Descent to and ascent from a conjunction of propositional instances.[25]

Example: Every dingo is a predator

WEAK DISTRIBUTIVE: Universal non-wide scope GQE.

Descent to a conjunction of propositional instances without ascent from an arbitrary single instance.

Example: Some predator is not a dingo

MERELY CONFUSED (AWeak Determinate@): Existential non-wide scope GQE.

Ascent from an arbitrary instance.

Example: Every predator is a dingo

LEFT-OVER ORDINARY: Terms in AOrdinary@ contexts without any GQE.

Descent to and ascent from a conjunction or disjunction of terms.

Examples: Every thing seeing every dingo runs

Every thing not seeing a dingo runs

NON-ORDINARY: None of the above

Examples: The apostles are twelve

Necessarily, a dingo runs

Socrates believes a dingo runs

Is this proposal at all in the spirit of the medieval tradition? I think so. For the additional distinctions made in this classification were made by Paul of Venice.[26] The additional distinctions are the distinction between strong and weak distributive, and the distinction between ordinary and non-ordinary. Paul calls my DETERMINATE ADeterminate@, he calls my STRONG DISTRIBUTIVE AMobile Distributive@, which he distinguishes from the amalgam of my WEAK DISTRIBUTIVE, MERELY CONFUSED, and LEFT-OVER ORDINARY (which he calls AMobile Merely Confused@). His category of AImmobile@ cases include some (but perhaps not all) of my NON-ORDINARY category. So he singles out wide scope existential and wide scope distributive (the first two above) for special consideration; these would be the ones that a twentieth century logician would want to figure in truth conditions for quantified terms in a recursive semantics; he then uses AMobile@ versus AImmobile@ to distinguish ordinary terms in extensional contexts without wide scope from the rest. (He also distinguishes between immobile distributive and immobile merely confused; I have not tried to capture this.)

If we compare Paul, Buridan, and Ockham (revised) with one another, we see that among them they made exactly the distinctions suggested above, though no one of them made all the distinctions:

<table>
<tr><td rowspan="5"></td><td colspan="6">All Common Terms Used Personally</td></tr>
<tr><td colspan="5">Ordinary Terms</td><td rowspan="4">Others</td></tr>
<tr><td colspan="4">Terms with Prenex Position</td><td rowspan="3">Terms Without Prenex Position</td></tr>
<tr><td colspan="2">Wide Scope</td><td colspan="2">Narrow Scope</td></tr>
<tr><td>□</td><td>□</td><td>□</td><td>□</td></tr>
<tr><td>Proposed Above</td><td>Determinate</td><td>Strong Distributive</td><td>Weak Distributive</td><td>Weak Determinate</td><td>Left-Over Ordinary</td><td>Non-Ordinary</td></tr>
<tr><td>Paul of Venice</td><td>Determinate</td><td>Mobile Distributive</td><td colspan="3">Mobile Merely Confused</td><td>Immobile</td></tr>
<tr><td>Buridan</td><td>Determinate</td><td colspan="2">Distributive</td><td colspan="3">Merely Confused</td></tr>
<tr><td>Ockham (revised)</td><td>Determinate</td><td colspan="2">Distributive</td><td>Merely Confused</td><td colspan="2"><no mode></td></tr>
</table>

So perhaps the classification given above, which seems to cut at the joints from a twentieth century perspective, is close to what supposition theory matured into. The classification is of interest because it is equivalently explainable in modern terms, or in terms of the medieval notions of ascent and descent.

Terence Parsons

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Notes

1. I make some comments about the second question in Parsons (1997).

2. There are English translations of Peter in Dineen (1990) and Mullally (1945), of Sherwood in Kretzmann (1966) and (1968), of Lambert in Kretzmann and Stump (1988), and of a typical anonymous writer in Barney *et al* (1997).

3. There are English translations of Burley in Spade (1997) and (forthcoming), of Ockham in Freddoso (1980) and Loux (1974), of Buridan in King (1985).

4. See ''70-74 of Loux (1974).

5. Sometimes other adjustments are required. For example, an instance of >No dingo is spotted= will be >this dingo is not spotted=, not >this dingo is spotted=.

6. This is the claim that every dingo is this *particular* mammal, not the claim that every dingo is a mammal of this *kind*.

7. Principally, Boehner (1959) and Moody (1955).

8. >Dingo= is distributed in >Some predator is not a dingo=, but that proposition may not be inferred from >Some predator is not this dingo, and some predator is not that dingo, and . . . , and so on for all the dingos=.

9. The process of forming prenex normal forms is well-known; cf. Boolos and Jeffrey (1974, 112-113). The fact that the formation of a prenex normal form can be viewed as the movement of quantifiers to the front of the formula depends on the fact that the steps do not introduce new quantifiers or lose old ones. Such steps are available when the connectives in the formula are negation, conjunction, disjunction, and the material conditional. This is not so if the formula contains biconditional signs (see ibid, page 113); fortunately, medieval theorists did not employ unitary biconditional signs. It is clear from their practice that they would have seen a proposition of the syntactic form >A if and only if B= as consisting of a conjunction of >A if B= and >A only if B=, neither of which contains a biconditional.

10. I have done that in work in draft form; I am relying on it here.

11. If you separate the restricted quantifier from its restriction, you can move the quantifier alone:

□x[Snow is white _ [x is a dingo & x is spotted]]

but this does not result in the whole >some dingo= moving.

12. Kretzmann (1968) 35-36. Sherwood=s sentence is >Every human who sees every human is running=; I have changed the first >human= to >thing= to avoid the complication of the same term being used twice; this is not essential to the point Sherwood is illustrating.

13. I assert this without proof; the reader is invited to try to find an equivalent normal form. The original sentence is a universal affirmative, and requires for its truth that there be a thing that sees every human; this aspect of it will be lost in most prenex forms. (If you decide to ignore

this medieval doctrine about universal affirmatives and instead hold that universal affirmatives with empty subject terms are vacuously true, then the vacuous truth of the original sentence when there is no thing that sees every human is lost in most prenex forms.)

14. It might appear that this is a peculiar result, dependent on a special view about existential import of subject terms. But the same result follows if we take the modern view that universal affirmatives are vacuously true when their subject terms are empty. For on that view the original proposition is true if nothing sees every human; thus the descent condition for determinate supposition fails: the original proposition does not entail that >Every thing that sees this human is running= for some particular case of >this human=. (Just imagine that each thing sees some human, but nothing sees every human, and nothing is running.)

15. De Rijk (1967, 615).

16. Kretzmann (1968) 35-6.

17. King (1985) 141.

18. Perreiah (1984) 152-53.

19. He says, A . . . >man= is properly distributed here, since part of the sentence is >which is not a man=. Even though this is not a sentence (since it is part of a sentence) it nevertheless has a likeness to a sentence with respect to the distribution and supposition of the terms; such terms supposit and appellate in an expression which is part of a sentence and which taken of itself is a sentence as they would in a sentence taken per se.@ King (1985) 138.

20. If you want to make a conjoint something-or-other, you need to make a conjoint negative predicate in the twentieth century meaning of >predicate=:

>Every[thing] not seeing this dingo and not seeing that dingo and . . . runs=.

But this is not the test; the test is descent to a conjoint term.

21. This requires a slight refinement of the theory concerning how to treat repeated terms; you have to test for supposition on the assumption that repeated terms are logically independent of one another. This fine tuning adjustment must be made both in the formal account for global quantificational effect, and in the theory couched in terms of ascent and descent.

22. This is subject to the grammatical idiosyncrasies of individual languages; sometimes in ordinary language it is not clear whether such descent is possible, or exactly how it is to be formulated.

23. King (1985) 130. Buridan adds to the definition that Aperhaps a sentence with a disjunctive extreme follows@, but he makes clear in other discussion that the >perhaps= means that some terms with merely confused supposition satisfy this and some do not. So it is not a requirement. (See discussion below.)

24. King (1985) 145.

25. This descent and ascent condition means descent to and ascent from the whole conjunction of instances, not just to/from a single instance. This is the condition used by Paul of Venice; see Perreiah 1971.

26. In his Logica Magna, translated in Perreiah (1971) 89-121. This account differs from that in the Logica Parva, translated in Perreiah (1984).