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Quantification, Substitution, and Conceptual Content

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The simplest statement of the goal of this paper is as providing an account of ontological commitment, of saying what it is to perform a speech act in natural language which commits one to the existence of an object. Since I shall presuppose without argument the Quinean doctrine that it is sentences properly regimented as (objectual) existential quantifications which carry such ontological commitment, offering such an account amounts to no more than offering an account of what it is for a sentence of a natural language to have the content of—or to entail some other sentence having the content of—an objectual existential claim. Nonetheless, such will be quite a large enough project for one paper.

I do not *argue* that the account I give here is the only viable account of objectual quantificational purport—of what it is for a claim to commit one to the existence of an object. I *believe* that no other candidate has actually been produced, and that there are far deeper obstacles to offering one than is typically appreciated, but to argue for that would require addressing the question from the perspective of each of the many current approaches to semantics.

This too is more than I propose to undertake, confining myself, again without argument, to a single controversial view in the philosophy of language. The view in question is one I call "normative inferentialism." It is a view which arises out of the work of Sellars and receives its most detailed treatment in Brandom's *Making It Explicit.* Thus, my goal is simply to show what such a normative inferentialist ought to say about the content of quantificational—hence, ontological commitment incurring—claims. This is a pressing issue for any sort of inferentialist, since there is reason to think

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that such an account cannot be given, and therefore reason to question the whole account.

Thus, my most concrete goal is to address a central objection to an approach to semantic content I endorse. However, the solution is of more general interest since by specifying some general constraints upon an adequate solution to the problem, and by showing how the normative inferentialist can meet these constraints, it will be suggested that there are the sorts of deep difficulties confronting other approaches to the issue which were hinted at above. Further, the solution to this problem will quickly generate solutions to other difficulties confronting the inferentialist camp, showing the whole approach to be, for example, more flexible in its ability to deal with subsentential content than was previously appreciated.

1: Formal theories of natural language content

There are three broad elements which must be found in any formal theory if it is to serve as an explanation of natural language content. First one requires the formalism itself. This must include a formal language which will be some set of objects classifed according to grammatical type and given a compositional syntax. In addition, the formalism must include some sort of content conferring structure. This could be a model theoretic interpretation, a proof-theoretic definition of inferential propriety, a game theoretic semantics, or whatever. All this together is the first of the three required elements.

The second element is at least a rough account of how to translate elements of the natural language into the formalism. To say that 'A&B' entails 'A' or that 'A&B' is true in a model iff 'A' is and 'B' is, is not to give any sort of account of natural language content until we say also that natural language conjunctions are to be mapped to sentences of this form.

These two elements, however, are not enough. We need as well some sort of mapping from features of the natural language to elements of the content-conferring structure of the formalism. For example, if we are giving a model theoretic interpretation of the formal language, one needs to explain what features of the natural language correspond to the interpretation functions for terms and predicates, that in virtue of which a term has a given extension. Without such an account, we may have a systematic *modelling* of what the intuitive truth conditions of a sentence of natural language are, but we have no *explanation* of its content, of how the sentence came to have these conditions.

It is this sort of need which lead Field to attempt a naturalistic reduction of the primitive reference relations of a Tarskian semantic theory, and obviously the same requirement holds regardless of what sort of semantic approach one adopts. If one is an inferentialist, one must explain that in virtue

of which a sentence has a given inferential role. A formal inferentialist semantics, after all, simply generates a set of sentential pairs from the formal language, with a special symbol — '⊢' — standing between them. Given a new natural language, what sorts of features of utterances are we to look for in determining which sets of such pairs correspond to a given utterance?

One caveat is in order already. The project presupposed here is a *normative* inferentialist one. That is, semantic content is to be explicated in terms of the semantic norms governing the use of sentences in a linguistic practice. Thus, I will not attempt to offer a naturalistic reduction of meaning, i.e. a naturalistic condition constitutive of a sentences having quantificational content. John O'Leary-Hawthorne and I have argued in depth [see *The Grammar of Meaning: Normativity and Semantic Discourse*] that one should not expect such a reduction in any event. Thus, the requirement considered here is that one explain what sort of normative proprieties of use a community must take to govern an utterence in order that this utterance be taken by them to have the content of a quantificational claim.

2: The problem of explaining quantificational content

There are two motivating reasons, each traceable to Kant and, more recently, to Frege, for supposing, as the normative inferentialist does, that the basic units of meaning must be sentences rather than subsentential concepts. The first reason is that any account of meaning must tell us what it is *to judge* or *to assert* that such and such is thus and so, but it is hard to see how to build such a notion out of any primitive account of conceptual meaning. Suppose that we give some sort of content to the subject term 'snow' and the predicate expression 'is white'. Perhaps we do this in terms of their causal relations to elements of the world, or their role in biological evolution, or by way of an abstraction from experience. The question then is how we put these together to produce the *judgment,* or *assertion, that* snow is white. We can, let us grant, bring both concepts jointly before the mind, or utter the two external bits of language sequentially. But how does *cohabitation* become *predication*? (Note following Frege, that the same two concepts are banged together when one says that snow is not white, when one asks whether snow is white, when one entertains the possibility that snow is white, etc. In virtue of what does an utterance count as one or the other of these speech acts?)

A natural answer can be given, if we begin our account with sentences rather than concepts. Though certainly not the only such account, I focus here on one developed by Robert Brandom[1] where he argues that the act of asserting can be understood, in the first instance, as an undertaking of justificatory responsibility. The difference between simply having the concepts of snow and whiteness present before one — or of uttering the word

'snow' followed by 'is white' — and of *asserting* that snow is white is that the latter act is one which carries with it a commitment to respond to legitimate challenges. One is responsible for giving evidence, has done something incompatible with asserting that snow is colorless, etc. Whether one accepts that this undertaking of commitment, and the related normative features of assertion Brandom emphasizes, is sufficient for an analysis of the act, it is quite plausible that it is necessary for it, that if one does not undertake such a responsibility, then one is not an assertor. The point crucial to our immediate concern is that this undertaking of justificatory responsibility seems a unitary act, not some sort of composite of any normative features of the bare utterances of a subject and a predicate.

Closely connected is an answer to the question of how an individual can exhibit an understanding of the meaning of an expression. Michael Dummett has gone so far as to claim that *the* defining question of semantic theory is that of what constitutes understanding a language and while one might not want to follow him in giving this question priority over all others, it is certainly one central issue. Now it seems that the minimal unit of meaning regarding which understanding can be exhibited is the sentence. If that is so, then if meaning is to be something an understanding of which is inherently exhibitable, one will be inclined to conclude, as Dummett does, that the sentence is the fundamental meaningful unit.

Of course one might deny that all meanings must be individually exhibitable as understood. One could say this and still suppose that a defining desideratum of semantic theory is the goal of explicating what is understood when one understands the meaning of bits of a language, by arguing that assignments of meaning to subsentential units find their justification in their ability systematically to generate exhibitable sentential meanings.[2] But then the problem becomes quite similar to that concerning judgment. What features, plausibly positable as the meaning of subsentential expressions could have a role to play in generating competence in the use of sentences. In the case of terms, for example, it is typically supposed that a primary, if not exclusive, feature of their semantic content is their referent. But why need one posit a reference relation between a term and an object in order to account for the use of sentences involving the term? Rather, it would seem that the explanatory story must go the other way around. We know what it is to exibit an understanding of the referent of 'Fred' by knowing what behavior is associated with the competent use of such *sentences* as 'lo, Fred'.[3]

Similarly in the case of predicates, the sententialist will attempt to account for the content of a predicate such as 'is red' in terms of inferential relations. Thus, if we ask after the meaning of 'is red', it is plausible to suppose that a part of the story is that a predicate F cannot mean red unless any sentence Fa entails 'a is colored'. That is to say, predicates get their

meaning in part from the inferential role of the sentences in which they find themselves embedded.

Notice further, that there is a natural and deep connection between the concepts of commitment and entitlement which were offered as a route to an account of the conceptual space of asserting and the content explicating concept of inferential role. The connection arises when we notice that the commitments undertaken in asserting a given sentence Q may already be undertaken in the assertion of P. Thus, in asserting that Fido is a dog, one is commited, thereby, to defending the claim that Fido is a mammal. This relation—commitment to P is, in part, commitment to Q—is one I have called "commitment entailment." Closely related to this relation is one which holds between P and Q when entitlement to Q can be based solely upon entitlement to P. That is, P permissively entails Q when a defense of Q with P forces a challenger of Q to challenge P as well.

It can be argued that these sorts of entailments constitute fundamental inferential relations constitutive of the semantic role of assertions. Thus, in the semantic analysis of assertions in terms of commitment or entitlement, we build in a salient sense of inferential role as well.[4] The understanding of entailment as either commitive or permissive connects as well with the idea that theories of semantic content should be theories of semantic competence. To say, as we did above, that semantic competence involves inferential competence is certainly not to say that one must, for example, assert 'x is colored' *after* asserting 'x is red'. Rather, the idea seems precisely to be that to understand 'red' is, in part, to be willing to accept commitment to 'x is colored' when one has undertaken commitment to 'x is red' and to be willing to allow others to use the latter as sufficient warrant for entitlement to the former.

These motivational remarks on behalf of a sententialist order of semantic explanation quickly push one to an appreciation of the importance to the account of quantifcational idioms. To see this, note the natural response of the advocate of subsentential semantic primacy. It is clearly possible to understand the meaning of a predicate expression, say 'suffered gravitational collapse' without being prepared to assert, commit oneself to, or attribute entitlement to any sentence involving the expression. One might, for example, not purport to know whether any black holes exist. If so, then one is in such a position with respect to the predicate concept in question. Thus, on the face of it, this seems to be a case in which one understands the meaning of a concept without that meaning being derivative upon a prior understanding of the meaning of sentences. At least this is the case if we assume, following the line of thought of the last section, that such understandings of sentential meaning are to be exhibitable by way of dispositions to accept commitment and to attribute entitlement.

Now the inferentialist will hasten to respond to this by pointing out that

while an agent may not be prepared to assert or attribute entitlement to any atomic sentences involving 'has suffered gravitational collapse', her understanding might still be captured in terms of commitment and entitlement as an *inferential* understanding. Thus, the putative competent user of the predicate expression is prepared to assert '*if* the mass responsible for radio signals of thus and such sort is one which has suffered gravitational collapse, *then* it must be a mass many times greater than that of the Earth.' This commitment to a conditional assertion can then be understood as a conditional commitment to accept commitment to the consequent as following upon any possible commitment to the antecedent.

The problem with this approach is that in understanding even the specifically inferential role of a concept one understands *more* than can be expressed in the inferential proprieties of such sentences in which it occurs. To understand 'is red' involves more than simply knowing that commitment to 'Fred is red' carries with it commitment to 'Fred is colored', that commitment to 'Joe is red' carries with it commitment to 'Joe is colored', etc. for every term in the language. Such a set of inferential proprieties might, for example, tell us not about the content of the predicate but merely that of what is had in common by all the subject terms of the language.

Clearly, the inferential content in question must imply that *for any object you pick* if it is red then it is colored. Thus, if this content is to be derivative upon the inferential role of sentences, we would seem well advised to look at the inferential role of quantificational claims—specifically quantified conditionals—rather than singular ones. To do so, however, is to run straightaway into the central obstacle in the path of the normative inferentialist.

This difficulty arises from the requirement that a theory of understandable content generate semantic values for complex sentences compositionally. While it is not hard to see how to understand the content of many sorts of sentences via a compositional generation of commitment conditions and, hence, of commitment-inferential role, there is a fundamental obstacle to pursuing this strategy in the case of quantificational sentences. The problem is simply that the semantic content of a quantified sentence is not a function of that of simpler *sentences,* but of component *open formulas.* But whereas a theorist focusing on relational semantics—a semantics which proceeds by defining relations between subsentential bits of language and something extra-linguistic, typically assignments of objects to terms, sets of objects to predicates and truth conditions to sentences—can perhaps accomodate this, it is a problem for the normative inferentialist since open formulas are not the sorts of things to which one can be committed or entitled.

It is precisely this problem which has led many inferentialists to an adoption of so-called "substitutional interpretations of the quantifiers." For any

grammatical category of quantifier—nominal, propositional, etc.—there are two sorts of semantic interpretation which can be given it: an objectual or a substitutional.[5] The former is an interpretation in which $(\forall x)\varphi x$ is true just in case every object is in the extension of φ. More precisely, given a normal semantic interpretation of the predicates and terms of the language in terms of relations to objects in a domain, we say that I satisfies $(\forall x)\varphi x$ just in case every a-variant of I, I′, satisfies φa, where a does not occur in $(\forall x)\varphi x$ and where an a-variant of I is an interpretation just like I except that it may assign a different object to a.

A substitutional interpretation of the quantifier, on the other hand, does not make reference to objects in the domain at all (or at least only insofar as the interpretation of non-quantified sentences does). Rather, if we interpret the quantifier substitutionally, we say that $(\forall x)\varphi x$ is true in an interpretation if φa is true on that interpretation for every term a in the language.

This substitutional reading thus avoids our problem with carrying through the commitment-inferentialist semantic program, for on this reading the content of the quantified sentence is, after all, a function of the content of simpler sentences. And, of course, there is nothing special about a definition in terms of truth conditions. Any inferentialist account which can handle ordinary conjunction will be able to generalize to this notion of quantification.

Indeed, this is precisely the rendering of quantifiers within a normative inferential framework which is adopted by Brandom in *Making it Explicit.* Commitment to a universal (existential) quantification is taken to be commitment to an infinitary conjunction (disjunction) of its substitution instances.

> As the discussion of the formation of complex predicates in the previous chapter indicates, universal and particular quantifiers are logical locutions that have the expressive function of making propositionally explicit conjunctive and disjunctive substitutional commitments. Attributing commitment to a claim of the form (x)Px is attributing commitment to *all* claims of the form Pa. [*Making It Explicit,* chapter 7, section II, §2.]

However, substitutional interpretations of typical quantifiers in non-formal contexts are not happy. They fail to capture the full intended semantic content. Obviously substitutional and objectual readings only coincide when there is a term for every object in the domain of quantification. These come apart when, e.g. we state that there is a real which is not the limit of any computable function. The truth of this seems not to require that there be a name 'a' in our language which refers to such a real.

Similarly, we use quantified sentences which *apply to every real,* i.e. are true just in case every real is thus and so. But there are many reals which do not have names or other terms which apply to them. Indeed, there are

uncountably many reals but only countably many terms in any language. So the simplest substitutional interpretation (the "simple substitutional interpretation" hereafter) is inadequate as an interpretation of natural language quantifiers.[6]

Both Dunn and Belnap and Bonevac have suggested that such difficulties can be overcome if we emend the substitutional reading to consider extensions of a language. Thus, we read a universally quantified sentence of L as true only if every substituend of it in every extension of L obtainable by adding new terms to L is true. Bonevac has argued [see "Quantity and Quantification"] that this can overcome the specific objection mentioned above since there can be uncountably many countable extensions of a countable language. Let us call this semantics "the extended substitutional interpretation."

Nor is Brandom unaware of the need to amend any theory which seeks to parse ordinary quantificational phrases along substitutional lines by moving from simple to extended substitutional readings:

> Such a substitutional rendering of quantification has been criticized as inadequate in cases where, for cardinality reasons, there are not enough singular terms to pick out all the objects one is quantifying over. . . . . The fact, however, that the stock of available substituends is in this way *limited* threatens a substitutional construal of quantifiers only if that stock is in addition conceived of as being *fixed.*

> It is of the essence of singular term usage that new terms can always be introduced—both new terms for familiar objects and terms that introduce unfamiliar objects, paradigmatically by description. We cannot indeed extend our language so as to have separate terms for *all* real numbers at once, but *each* real number can be picked out. For there is no real number that we cannot specify—for instance by a definite description in terms of converging sequences of rational numbers.[7] The substitution instances Pa one becomes jointly and severally committed to by committing oneself to a claim of the form (x)Px include not only those formed from terms a that are currently in the language, but all those that *could* be introduced. The substitutional construal of quantificational commitments requires that the expressive powers of a set of discursive practices be conceived in the wider sense that takes account of the possibility of introducing novel expressions, rather than in the narrower sense that restricts attention to locutions already actually in use. This latter view amounts to freezing an idiom, taking a snapshot of it and evaluating its expressive capacities in abstraction from the process by which it develops. [Chapter 7, section II, §2.]

While one should be prepared to endorse both the point that linguistic practices are diachronically structured entities and the essentiality of attend-

ing to the possibility of expressive enrichment, this move from the simple to the extended substitutional reading will not achieve the adequacy of that interpretation. Peter Van Inwagen has pointed out that the most basic problem is not simply that there are more objects than there are terms—that there are undescribed objects—but that there are undescribable objects. Thus, consider the sentence "Some well ordering of the reals has a first element." This sentence is certainly true, but *no* well ordering of the reals could be named in any language. Thus, the Belnap-Bonevac ploy makes no headway in this case as the sentence comes out false even on the extended substitutional reading.

Nor do we need to turn to the realm of mathematics to see that the diachronic revisionary proposal of Brandom's is inadequate as it stands. It is certainly true that there existed a good many hairs in the vicinity of the left rear knees of wooley mamouths and we can say many true things about them. All of these hairs were, for example, less massive than the Lincoln Memorial. Yet it is fairly clear that few if any of these hairs are describable by way of definite descriptions of our language. Nor will any more become so accessible in the future as our linguistic capabilities expand. We not only do not, but, in the sense of possibiltiy which I would urge to be relevant to this aspect of semantic content, *cannot* refer to specific hairs long since decomposed, nor to specific neutrinos in distant galaxies, individual grains of sand in death valley, or thoughts of beings with whom we will never communicate. We can, however, quite easily quantify over each of these.[8]

3: Arbitrary objects

Before returning to the question of what the inferentialist can say about content, let us pause to consider and explain another feature of the use of singular terms. Let us distinguish two contexts within which singular terms can occur, calling these 'referential' and 'arbitrary'. The first are the usual contexts in which one says, for example, "Joe is bringing the beer to the game tonight." Whatever semantic account we give of such sentences, it is certainly right to say that there is a referential commitment involved in asserting them. If 'Joe' in this sentence could be shown not to refer—if it could be shown that there was no correct answer to the question 'who is Joe?'—the sentence would prove defective in some way.

The second context of use of a singular terms, however, is quite different. Consider the following bit of discourse: "We know there are transcendental numbers larger than any previously generated prime. Let α be such a number. Then α is not a ratio of integers." The use of 'α' is certainly not *fictional* here, to be understood on the model of "Sherlock Holmes lives in London." In uttering the final sentence of our little discourse, one is in no sense saying something that is false, or something that is only true in a

story[9]. There really are such numbers and if α is one of them it is straightforwardly true that α is not a ratio of integers.

Equally clear, however, is that the use of 'α' is not referential in the sense noted above for it would be out of place to ask which number α is. The whole *point* of this use is that it does not commit one to α's being any particular number. And it is undeniable that people use terms in such arbitrary contexts, not only in mathematics, but in all regions of discourse.

If one suposes that all singular terms are to be semantically understood in terms of relations to that object to which they refer, then our appreciation of such contexts will lead one down the path followed by Kit Fine of postulating arbitrary objects as the referents of arbitrary terms. Thus, Fine is prepared to say that there are not only the specific large transcendental numbers, but also various arbitrary transcendental numbers. The arbitrary number α discussed above is not identical to any of the specific numbers which share its properties; it is a different entity altogether.

Now I don't wish even to rehearse an argument against the existence of arbitrary objects here; to be honest this is because, as Fine makes clear, a knock-down argument is hard to come by. Rather, I simply record my inability to believe in such things. I do not believe that there are, in addition to the integers 1, 2, and 3, additional arbitrary elements of the set {1, 2, 3}. Thankfully, no such ontological extravigance is required, since when we return to this normative-inferential project we come to realize that there is no obstacle to making sense of the category of arbitrary terms without positing an object for them to correspond to. After all, what are we going to say about the semantics for singular sentences Fa, in which a is a referential term? The suggestion has been to record those commitments undertaken in asserting this sentence, those additional propositions entailed by it.

For certain other predicates, G for example, commitment to Fa may carry with it commitment to Ga. This may be, intuitively, because of the fact that F and G are related as in 'is a dog' and 'is a mammal'. Or it may, if a has descriptive content, have to do with the singular term a (though the actual account of the normative inferentialist will go the other way around. The facts constitutive of a term's having descriptive content must ultimately resolve to inferential proprieties governing the sentences in which it occurs.)

The mark of a specifically referential use of a term is that the assertor is subject to a commitment to defending all the presuppositions of the who-question — 'who is a?'. In some cases one must actually be prepared to answer this question in order to be entitled to the referential assertion, but one must at least be prepared to justify the presupposition that there *is* an answer to such a question. This commitment is what underlies the intuition that ordinary terms must refer and what allows us to preserve this referentialist intuition without supposing that the semantic content of the term is

defined via a relation to an object.[10] We simply build in this commitive consequence of sentences as part of their functional role in the linguistic practice.

In the case of an arbitrary term, the semantic account of the sentence is the same as that for a referential term except that this identificatory commitment is missing. Thus, suppose someone asserts: 'let r be a real strictly between 0 and 1. r is representable as a sequence of rationals'. The assertor is commited to a range of propositions: that r is between 0 and 1, that r is between 0 and 2, etc. that r is representable as a sequence of integers, that r is representable, that r is not identical to 1, and so on. Many things can be inferred from this set of commitments, together with the background commitments of the assertor. However, the assertor is *not* commited to answering the question of what specific real r is, or even to arguing that there is some true answer to it. Indeed, the very point of such discourse requires that there *not be* an answer to such a question.

Thus, the commitments undertaken in asserting a sentence involving an arbitrary term are weaker than those undertaken in asserting a corresponding sentence with a referential term. (Of course they are also, in a sense, stronger, since although one need not defend the existence of identifying characterizations of the subject, one cannot *utilize* any such either. Thus, it is much easier to defend '1 is odd' than 'r is odd' where 'r' has been introduced with 'let r be a real'.)

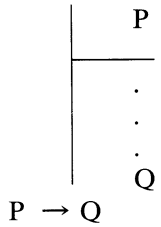
4: Four Grades of Hypothetical Involvement

Reasoning involving arbitrary terms exhibits a substantial level of "hypothetical involvement", a level which can be understood more clearly if we see it as arising in stages. On the sententialist order of explanation, the most basic sort of reasoning or inference involves sentences which, from the point of view of their semantic content may be viewed as wholes. Thus one infers from some accepted claim P to another, Q, or one draws out another's commitment to P as carrying with it commitment to Q.

The first grade of hypothetical involvement arises when we find the need to reason regarding sentences we are committed neither to accepting nor to denying. Thus, we may reason from P to Q in a situation in which we have no idea whether P is true. In doing so, we imagine ourselves in a dialogical situation like the actual one except that everyone must accept that we are entitled to P and within this hypothetical reasoning exercise we go about trying to justify Q just as we would if actual entitlement to P had been secured earlier. If we succeed in justifying Q in this manner we take ourselves then not to have shown entitlement to Q, but rather to the conditional judgment "If P then Q." We step back, abstracting from the question of the truth of P, and thereby achieve entitlement to a conditional.

Such hypothetical reasoning is, of course, quite important from the point of view of an inferentialist semantics for, as Brandom has urged, it is here that we argue for the claims which have contents which serve to license the types of moves which generate content for the underlying language.[11] The ultimate role of these hypothetical contexts is, then, to allow for the explicit consideration, evaluation and emendation of the underlying inferential norms of a linguistic practice.

This hypothetical reasoning is familiar in formal contexts as well, being an example of conditional proof. In a Fitch-style system, conditional proof would be represented schematically as follows:



On the first line we suppose P—the act of signalling that we are going to play an emended game in which challengers and defenders are allowed entitlement to P, but in which this entitlement does not have to be defended—and in subsequent ones we defend Q from within the hypothetical context so instituted. Finally, having demonstrated that one can legitimately infer Q from P, one concludes the conditional which says precisely that this can be done.

In moving to the second stage of hypothetical involvement, let us suppose for simplicity of exposition that our language has a surface syntactic distinction—a distinction in the actual physical items the production of which marks assertional commitment—between subject and predicate. We do not at this stage want to suppose that the distinction is of any semantic significance and the account can be developed without this assumption at all, but for simplicity, we suppose that the semantically homogenous sentences which are fodder for assertion, challenge, and inference are themselves structured as, for example, Fa.[12] In this case, one might undertake a second grade of hypothetical involvement when engaging in reasoning.

We have, so far, gone from a situation in which we reason claiming to know that Fa is true to one in which we merely reason *as if* it is true. The second grade of hypothetical involvement requires of us an additional burden. Now we not only abstract from the truth of our premise Fa, but also allow ourselves—think of it for the moment simply as an arbitrary constraint—to reason only to conclusions of the syntactic form Ga and

even then only if the corresponding inference from Fb to Gb would also have been appropriate no matter what term b happened to be.

If the ordinary reasoning situation is a coherent one, then this emendation of it is also; and there is no reason why members of a dialogical community could not so limit themselves—reason with their subject-terms tied behind their back, as it were. To argue for Ga under these restrictions is obviously in general harder than to do so from the unlimited presupposition that Fa since one can make use only of a subset of the generally licensed inferences. This greater justificatory burden carries with it a correspondingly greater reward, however, for one who so argues has actually shown the appropriateness of an inference *schema,* and should then be allowed to move directly to Gα whenever she becomes entitled to Fα no matter what term α might be.

This is just to say that one is entitled, on the basis of such a second grade hypothetical justification, to conclude that all F's are G, but only under the caveat that this quantification be taken to be a simple substitutional one. The reason for this caveat is that one has only defended the permissability of each of the substitution instances of this quantification in the language. Nothing has been shown even regarding novel substitution instances, much less unnameable objects.

A third grade of hypothetical detachment is possible as well. By way of motivation, suppose we are still at the second stage and that we know that the only ancient structure over two tons which we have the linguistic resources to refer to with a singular term is the sphinx. This situation might arise if all other such structures were long ago destroyed with no uniquely identifying descriptions surviving in the historical record. (Though perhaps there is ample evidence that many such structures existed.) In such a situation, we would be strictly within the rules of the second grade of hypothetical detachment to reason as follows.

"Suppose α is a structure weighing more than two tons. Then, since the only structure which 'α' could be referring to is the sphinx, we can conclude that α has a nose. So all ancient two ton structures had noses."

Now there is nothing fallacious about this reasoning, if we recall that the conclusion is a simple substitutional quantification. And let us note a crucial point at this juncture. Our ultimate theoretical idea is not to explain the hypothetical reasoning context in terms of a prior notion of simple substitutional quantification. Pedagogically we have proceded in this manner for we are all familiar with the distinction between substitutional and objectual quantification within the context of a formal language and its usual semantic and proof theoretic articulations, while the delineation here offered of the various reasoning contexts is novel, but in the official explanatory story for natural language things must go the other way around. Our goal is to explicate semantic distinctions on the basis of pragmatic force within the

normatively structured practice of a community. Thus, it is the permissability of such moves as the foregoing in the justification of "*all* ancient two ton objects had noses" which constitutes the fact that 'all' as used here has the simple substitutional content. (And the fact that we can easily understand the sorts of contexts within which these quantifications function and the sorts of norms operative there shows that while colloquial English may not actually contain a substitutional quantifier, it is perfectly coherent—indeed, easy—to understand how to add one.)[13]

Keeping all this in mind, we suggest an obvious and more stringent variant on hypothetical reasoning, namely that in arguing for a hypothetical conclusion one not make use of background assumptions regarding what things are, in fact, within the range of our singular descriptive resources. This is the third grade of hypothetical involvement, wherein such historical facts are ruled out as justifiers *de jure.* If we were to do so, we would thereby create a context the legitimate conclusion of which would be an extended substitutional quantification. A successful justification of Ga, on premise Fa under such restrictions would license one in conluding not only to the appropriateness of inferring from Fa to Ga for any a *in the language,* but since we had abstracted from specific facts about what terms exist in our language, we would be entitled to infer from Fa to Ga even if 'a' was some new addition to the language. The extended substitutional quantifier, then, is a marker that this justificatory work has been carried out and a license to make any such inference.[14]

Our final grade of hypothetical involvement, then, comes when we require that the terms occuring in the hypothetical reasoning situation be genuinely arbitrary. That is, we require of the person seeking to justify a conclusion Ga on the basis of hypothetical premise Fa not only that she not make use of any facts particular to a, nor even that she eschew facts true of a in virtue of being true of all named entities in the language, but that she not even make use of facts presupposed by any *possible* referential singular sentence. That is, in invoking the fourth grade of hypothetical involvement we cannot even make use of the general indentifiability presupposition of singular terms in the process of inferring from Fa.

Again the conclusion of our reasoning will be a universally quantified conditional "all F's are G's" but in this case we must argue for this starting with the assumption that α is F where α is genuinely arbitrary and it is the presence of reasoning contexts which so restrict allowable inferential moves which constitutes the fact that the singular terms occuring in that context are arbitrary ones. What it is for a linguistic practice to use a sentence in such a way that its terms are properly understood as arbitrary is for these inferential restrictions to apply.

Again, these inferential rules will be familiar to anyone who has seen a natural deduction proof theory for the predicate calculus. What we are

looking at is a proof strategy in which one employs conditional proof and universal instantiation. Thus, a proof will look like the following:



$Fa \rightarrow Ga$
$(\forall x)(Fx \rightarrow Gx)$

For this last step to be valid, the term 'a' must be arbitrary in a particular formal sense. Generally it is assumed that it not have occurred anywhere else in the proof before the line Fa which introduced this particular subproof. This is precisely the restriction in the formal context which corresponds to our restricted commitment content in ordinary language. Notice then, that we are doing just what we promised. We are offering not only a formal inferential account of the content of quantificational sentences in terms of natural-deduction rules, but a mapping from the elements of such a proof theory to specific features of the normative linguistic practice of natural language. We have particular emendations on the usual commitments undertaken in the assertion of a singular term involving sentence which correspond to the arbitrariness requirement on universal instantiation. We have arbitrary contexts, the introduction of which (typically with such a locution as "let a be F") corresponds to the first line of a new conditional subproof.

Notice further, that once we have a context within a linguistic practice which allows for the use of arbitrary terms, we can finally speak sensibly of the seperate *semantic content* contribution of predicate and subject to a term (rather than merely the physical seperability of the physical markers of linguistic commitment). We can say now that an inferential propriety—say from Fa to Q—is contributed by the predicate just in case Q is legitimately inferrable from Fα *where* α is arbitrary. Then, we say that an inference is a feature partly of the content of the subject if it holds for Fa as antecedent, but not for Fα.

5: A solution

We are now quite close to a general normative-inferentialist account of the content of quantificational claims, though we are not quite there yet. So far we have said that one can infer genuine objectual quantificational claims via universal instantiation from a hypothetical demonstration involving arbi-

trary terms. Similarly, *from* a corresponding universal claim one can infer the appropriateness of any substitutional instance and further, this being the crucial point, these instances include among them arbitrary ones.

The problem with taking this to be a general explication of quantificational idioms is that it only speaks to the use of sentences of the form $(\forall x)(\varphi x \rightarrow \psi x)$, for the result of the hypothetical conditional proof contexts we have been considering are always sentences of the form $\varphi a \rightarrow \psi a$. However, given that we have such contexts, one can now understand the role of quantificational claims generally.

The substitutional rendering was indeed onto something in attempting to assimilate universal quantifications to infinitary conjunctions. The difficulty arose by neglecting the existence of arbitrary terms and, hence, in failing to recognize that these offer a sort of expressive resource unavailable to a language with only referential terms. The solution to the difficulties faced by substitutional interpretations of ordinary language nominal quantifiers lies in seeing that commitment to $(\forall x)\varphi x$ carries with it commitment not only to the referential substituends of this sentence, but to the arbitrary ones as well. So if I say that every well ordering of the reals contains a first element, and then go on, in the course of a hypothetical proof, to say "let w be a well ordering of the reals", I am thereby commited to asserting, in this context, that w has a first member. Universals generally allow one, thus, to bring background assumptions into use in hypothetical argument. We cannot bring in any information uniquely tied to the term introduced with the hypothetical context—that is, after all, precisely the feature of the normative context constitutive of the term's arbitrariness—but if we have established that *everything is F,* this is precisely what is needed to allow us to assume $\varphi\alpha$ for arbitrary α (which may already have been introduced into the discourse).

Thus, universals play the general role of facilitating inferences from other singular claims, this facilitation being carried out by allowing for the incorporation of auxilliary information. Obviously if one is entitled to the referential assertion Fa and then defends $(\forall x)Gx$, one can infer not merely from Fa, but from Fa&Ga. The crucial distinction between simple or extended substitutional and objectual quantification is constituted by the fact that the latter licenses such importation of auxilliary information into arbitrary contexts as well.

Similarly, in the case of existentials, to say that "there is" a well ordering of the reals in which every integer is a successor of an irrational is not to suppose that there is a referential substituend of this claim which is true, i.e. not to say that some sentence "α is a well ordering of the reals in which every integer is a successor of an irrational" in which 'α' is referential is true. Nor does our existential claim produce committive consequences when conjoined with a claim involving an arbitrary well-ordering-of-the-

reals name, for it is not a universal. If we suppose that α is a well ordering of the real, we cannot then go on to use an *existential* claim of the above sort to infer that *it* is such that every integer is a successor of an irrational. But there is a commitment incumbent upon the assertor of such an existential, namely to treat as appropriate introductions of arbitrary names stipulatively predicating "is a well ordering of the reals in which every integer is a successor of an irrational."

Recall that one does not enjoy an unrestricted entitlement to introduce claims of the form "let α be such that φ." This is due to the fact that this introduction of a name may itself commit one to a claim which cannot be defended. Because of this, assertors are not committed to allowing such term introducing predications by those challenging them. But making an existential claim $(\exists x)\varphi x$ does commit one to treating as appropriate an introduction of an arbitrary name 'a' via the claim φa.[15] Similarly, if I defend $(\exists x)\varphi x$, I can then introduce φa—given appropriate restrictions on 'a' guaranteeing arbitrariness—into hypothetical dialogues, typically with the goal of using this as ammunition against an assertor seeking to demonstrate the appropriateness of a universal inference. Just as universals serve to *facilitate* hypothetical inferences, so existentials serve to *block* them. Again the substitutionalist was right to assimilate existentials to infinitary disjunctions, *so long as these are understood to include arbitrary instances as well as referential ones.*

What I take to be the key insight of Fine's work in his *Reasoning with Arbitrary Objects,* is his formal demonstration that the connection between quantificational sentences and arbitrary substituends presupposed in typical natural deduction formulations is semantically *sufficient* as well as necessary. We can give a complete semantics of ordinary quantificational claims—one which "works just like" ordinary objectual construals—if we read them as substitutional within a language containing arbitrary names.

Notice that we have actually offered an improvement upon the usual accounts of simple and extended substitutional quantification. Arguably, one needs the sort of hypothetical reasoning contexts deployed in the account of objectual quantification, even here, for it is not altogether accurate to characterize them, as I have been doing, as being equivalent to infinitary conjunctions of instances. Any substitutional universal carries more information than its infinitary conjunctive correlate, namely "that those are all there are." That is, one could be committed to Fa, for every term a in the language, and yet not be committed to the corresponding substitutional universal, if one were not committed to these being all the terms of the language.[16]

The situation is different if we see the substitutional universal arising as a product of a kind of inference scheme. The justifying of Ga, for arbitrary a, on hypothesis Fa, does indeed justify the open ended conjunction of

instances, no matter how many there are. Thus, the importance of arbitrary terms seems to arise already at this level. All that is distinct about the various sorts of quantifier is the "level of arbitrariness", so to speak, of its crucial instances.

It appears, then, that a commitment-inferentialist can make sense of quantificational claims as they are used in natural language. They are understandable as infinitary combinations of sentences, some of which lack referential purport in the subject position, but ones whose commitment inferential role is simple to specify nonetheless. Having made sense of these sentences, we can then see how to make sense of a sort of priority for conceptual meaning over sentential. The point is simply that one might well know the content of a predicate—an understanding exhibitable by an ability to formulate sensible assertions constructed from the predicate together with arbitrary terms—without being prepared to assert any referential sentences incorporating the predicate.

Indeed, it is the understanding of predicates in arbitrary contexts which is the typical test for understanding of predicate content in any event. We noted, in considering the case in favor of the priority of conceptual meaning, that one understands more in knowing that "red" entails "colored" than that each substitution instance of this is true. We can now put this point simply as the observation that we know more than that each *referential* substituend is true, namely that the arbitrary ones are as well. That is, we know precisely that *all* red things are colored, i.e. that if Fred is an arbitrary red thing, then he is colored. This knowledge amounts precisely to our skill at employing arbitrary terms within hypothetical reasoning contexts and at embedding these inferentially within broader non-hypothetical ones.

Of course, there is an even more substantial pride of place on this account for sentential meaning. For it is the structure of sentential usage—commitment, entitlement, inference—which is the precondition for an understanding of *any* subsentential units. One must be a competent player, as Sellars said, of "the game of giving and asking for reasons" (for sentences) before one can exhibit any sort of subsentential understanding of meaning, indeed, before the question of whether one understands a particular subsentential unit makes any sense at all. The reason is simply that semantically significant subsentential syntax can exist only in the context of, being constituted by its role in, hypothetical reasoning contexts themselve formed via the local emendation of the sentential linguistic norms already in place in a dialogical community.

6: An objection

There is a worry about the use of substitutional quantification in semantic explanation which has not been dealt with.[17] The usual account of substitu-

tional quantification considers all instances of a sentence Fa, where 'a' is any term of a language. But then when one turns to the semantics for certain terms, specifically definite descriptions, one presupposes quantifiers. That is, we explain the content of "the x such that F is G" by way of quantifiers, thus leading to a small explanatory circle.

This problem can easily be disarmed on the present account, for we simply do not need definite descriptions as part of the content of quantifications once we have arbitrary terms on board. That is, we can conceive of $(\forall x)Fx$ as the infinitary conjunction of all sentences Fa for any *name* a. Normally, of course, this would be a serious restriction on the content of the quantificational claim since our language allows for reference to far more objects via descriptions than via names.

Once we understand the substitution instances of the nominal variable to include arbitrary as well as referential names, however, this problem disappears. We obtain the full content of the quantification from the arbitrary nominal instances, and do not need even to consider definite descriptions. Under the assumption that a definite description is referring, we obtain trivially the conclusion that its instance of a quantification is true.

Thus, suppose we have $(\forall z)Fz$ understood as the conjunction of purely nominal instances. Now consider the usual rendering of "The x such that G is F." This is rendered as $(\exists x)(Gx \ \& \ (\forall y)(Gy \rightarrow x=y) \ \& \ Fx)$. We are assuming $(\exists x)(Gx \ \& \ (\forall y)(Gy \rightarrow x=y))$. Thus, we can introduce an arbitrary *name* a and assert $Ga \ \& \ (\forall y)(Gy \rightarrow a=y)$, by the consequences of application of an existential. But now, we use $(\forall z)Fz$ to license the conclusion Fa. Indeed, we can even take $(\forall x)Fx$ to be a conjunction of arbitrary instances only. Thus, given $(\forall x)Fx$ and $(\exists y)(y=a)$, we can still derive Fa, for referential 'a'.

7: The need for "objectual quantification"

We now have three sorts of substitutional interpretation of a quantifier: the simple substitutional interpretation which treats the claim as an infinitary combination of actual referential sentences in the language, the extended interpretation which includes as well terms which could be added to the language, and finally what we might call the "arbitrary substitutional interpretation." However, a better name for this last interpretation, at least if our argument so far is correct, is simply the "objectual interpretation." This name suggests itself since the account is now a genuine competitor *analysis* of just those uses of quantifiers which are typically taken to require standard relationalist accounts in terms of domains and interpretation functions.

Now a crucial and seldom considered question is why a natural language would incorporate the device of objectual quantification in the first place. What expressive loss would be entailed by the elimination from our lan-

guage of devices for objectual quantification? Restricting our attention for the moment to the universal quantifier, it is easy to see why a linguistic community would incorporate a device for simple, or even extended, substitutional quantification, a reason akin to the usefulness of conjunction. To quantify substitutionally allows one to assert — to commit oneself to, or to attribute commitment to — infinitely many sentences all at once.

However, why would one want the additional expressive resources of objectual quantification? On the usual relational semantic story, in asserting a universally quantified sentence one predicates something of every object in the domain. As pointed out above, it *could* certainly be useful to do this all at once. We are concerned with many objects and may want to ascribe a certain similarity to lots of them and to do this without asserting infinitely many sentences.

However, extended substitutional quantification will accomplish this, allowing us to ascribe a property to every object we could ever (singularly) refer to. The question, then, is why we should ever have a reason to quantify not only over objects to which a term in some extension of our language can refer, but also over "linguistically inaccessable" objects. Why would we want to predicate things of objects inaccessible via our mechanisms of singular reference? Presumably, if an object is linguistically inaccessible, it will be inaccessible in most other ways as well: it won't be something we causally interact with, perceive, use, know how to identify, etc. So why would we come to have the linguistic resources to predicate things of it? What abstract purpose could be served by so strong a mechanism of reference?

Note that even a simple substitutional quantifier could be allied with a sort of arbitrary singular term. That is, one could take a simple-substitutionally understood claim "all F are G" as licensing the move from 'suppose a is an F' to 'a is a G', and thereby facilitating the sort of hypothetical reasoning context so useful for the proofs of universally quantified claims, provided that one understands the arbitrary name a to be a sort of place holder for the various referential names of the language.

To do so would be, essentially, to take commitment to 'a is F' to be more perspicuously rendered as 'there is an object referred to by some name of the language and it is F'. Inferences could then be drawn from such claims, and then universal instantiation (to a simple substitutionally universally quantified claim, of course) applied at the end of the inferential chain.

To see things in this way, however, is to begin to see what is special about true arbitrary terms and predications involving them, for the arbitrary instances which result from a context of simple or extended quantification seem to employ tacitly an operator which changes a simple predicate 'is F' into a more complex one 'is referred to by some term and is F'. If we recall, then, that it is precisely these explicit statements of inferential propriety —

all F are G, or an F must be a G, etc.—serve to express the inferential content of predicates we see the crucial difference between arbitrary substitutional quantification and simple substitutional quantification as lying in the fact that the former gives us a way of expressing the content of our normal predicates alone, without conjoining the inferential contribution of the predicate with that of the referential purport of a subject term.

On the present account, the existence of objectually interpreted quantifiers in a language will be expected whenever the language contains not only referential but also arbitrary terms. Thus, we need to ask specifically what is gained in expressive power when we incorporate arbitrary terms into a language. The answer is precisely that this allows us to state claims the defense of which depends, *de jure,* solely on the content of the predicate. This, in turn, allows us to state explictly features of the content of predicates and, so, to evaluate and amend these consciously. (And also, crucially, to recombine these same contents with novel additions to our language.)

To be sure this account—that arbitrary terms allow us to express the content of predicates lacking subject-indentifiability implications—amounts to an explanation only if we can see what reason there is for a language to incorporate such predicate concepts. Nonetheless, progress has been made. We have said that what it is to undertake commitments *vis a vis a range of objects*—indeed, what it is to be ontologically committed to them—is to predicate of them using predicates governed by inferential proprieties correctly stateable in a language of arbitrary terms. For the use of a sentence whose surface structure is subject-predicate to involve genuine commitment to the existence of the referent of the subject term, then, is to play a language game in which the inferential contributions of subject and predicate are seperable.

Thus, when we say that 'the average American mother has 2.3 children' does not commit us to the existence of average mothers (each having 2.3 children), we have in mind some sort of contextual re-definition of the sentence. One might think, for example, that what is asserted is that the number of children of American mothers divided by the number of American mothers is 2.3, or some such. But this latter re-statement is one whose content precisely cannot be cut into the parts "average American mother" and "the x such that x has 2.3 children." The contextual definition has the logical form of an identity—a divided by b is c—not a predication and so, it is claimed by the eliminativist, the original sentence had this logical form as its deep structure all along. Compare this to the case of ontological reduction, where we replace a term position bit of language with another one, still allowing the replacement of this very syntactic position with an arbitrary term. In this case one says that one really is committed to the existence of the reduced entity. The reason ultimately is that in the case of the

reduction, the content of the sentence is governed by that of the surface predicate concept, whereas in the case of elimination it is not.

Now, we can see the point of such arbitrary terms, and hence of objectual quantification, by interrogating the role and importance of particular predicates. We say, for example, that there are well orderings of the reals. This implies commitment to an infinitary disjunction with such instances as "w is a well ordering of the reals." Each such instance implies "w is an uncountable set which is well orderable." Thus, commitment to this original claim blocks entitlement to the inference from 'a is well orderable' to 'a is countable'. Similar existential facts prevent us from inferring from 'a existed in the past' to 'a stands in some precise definable relation to something we can refer to in the present'.[18]

The question then is how to understand the propriety of such a commitment. Rather than say that the inference from well-orderable to countable is invalid because our term 'set' manages to "grasp onto" sets which can be well ordered, but not enumerated, the present idea is to turn the explanation on its head. What it is to say that there are such well orderable sets — and that our term 'set' refers to them — is to say that this inference is not part of the content of the predicate expressions in the language game of sets. To endorse the existential, hence negative universal, assertion is to assign a content to our predicates which blocks this inference. As such it is explicitly to endorse the use of a predicate whose content could not be discussed were it not for arbitrary terms. The reason is that any predicate, F, which implied countability would simply not mean 'is well-orderable' and, hence, to say even of a perfectly definable set that it is F would be different than saying that it is well-orderable. Thus, we understand quantifying over non-definable objects as an artifact of our desire to predicate specific properties of *any* objects and to be able to make explicit the content of these predicates.[19] If we lacked objectual quantification, we could not say, and make explicit, the usual things even of the objects to which we have singular referential access.

In our practice, we assert in such a way that chains of inference can legitimately be challenged by way of, for example, 'Fred is an uncountable well-ordering'. It is ultimately the utility of a language game in which inferences are thus limited that underlies the utility of objectual existential quantification. None of this is to say, of course, that there *isn't* a universe of sets independent of human thought, or objects beyond possible human empirical experience; the point is not to be an anti-realist about the objects in the domain of our quantifications. Nothing in the commitment-inferentialist story denies *this,* or could, since this would *just be* to claim that all objects are definable by singular terms. And this would be to endorse an inferential propriety that we wish to reject.

What is important, however, is the *order* of semantic explanation; that

relations to objects in an inaccessible domain not be the *explanans* of the content of our quantificational idioms. Rather than explaining the inferential content of predicates as arising from their somehow being able to "grasp" or "correspond to" objects which no singular term can similarly relate to, I urge that insofar as it is useful to describe our quantifiers as ranging over inaccessible objects, this is a semantic feature which is itself to be explained in terms of the prior usefulness of incorporating into our language predicates from which certain inferences do not follow. Then, this talk of inferential content for predicates is understood in terms of the inclusion in our language of arbitrary terms which are legitimate substituends of "objectual" quantifiers.

So the existence of arbitrary terms and, hence, objectual quantifiers brings with it an increase in expressive resources to be sure, but not, as is the traditional view, one whose primary point is to increase the range of entities we have brought ourselves into "contact" with. Rather, the increase has to do with our ability to express what we can say about *any* of those entities, particularly, of course, those we can define. We can say, even of the integer 1, that it *is a real,* and of the simple set {1, 2, 3} that it *is well-orderable* and then discuss the content of the predication so made. Without arbitrary terms—or, equivalently, objectual quantification—we simply could not do this.

8: Propositional quantifiers

A strictly parallel account can be given in the case of propositional quantifiers. Thus, if we adopt a substitutional reading of propositional quantifiers and understand 'is true' as a prosentence forming operator[20], then such sentences as 'anything the oracle says is true' will simply be equivalent to the conjunction of "If the oracle says it will rain, then it will rain' and so on and there is nothing puzzling about the content of such a conjunction.

Problems analogous to those in the nominal case would beset either a simple or an extended substitutional reading. To take the most extreme case, we would not like mere logic to rule out the possibility of propositions not expressible in any language. If there *are* well orderings of the reals then for each such well ordering w, the proposition "that w has a first element" exists, is true, is necessary, entails that w has elements, etc. But no one can utter any such singular proposition.

The possibility of inexpressible propositions need not worry the advocate of substitutional interpretation and propositional quantification, however, for there is an easy understanding of such claims available. Just as in the case of singular terms, we can have arbitrary sentences as well. "Suppose Lewis says that such and such. Then you should count on his having a

good argument that it is true." Here the phrases 'such and such' and 'it is true' are arbitrary sentences or propositional constants. Just as inferences from 'suppose a is F' to 'a is G' express part of the inferential contents of F and G, so to endorse the inference above is to express a feature of the content of the *sentential operators* 'Lewis says that ' and 'Lewis has an argument for the claim that'. That is, while nominal quantification allows us to state explicitly inferential proprieties regarding predicates, propositional quantification allows for the expression of the inferential content of sentential connectives. Just as arbitrary names allow for the seperation of subsentential predicate content, so we seperate off the semantic content of sentential operators by utilizing arbitrary sentences.

For example, to say that there are necessary propositions which are not stateable in human language is to commit oneself to the propriety of introducing some arbitrary sentence of the form 'it is necessary that P' where P is genuinely arbitrary. That is to say, asserting it carries with it none of the usual commitment to identifiability. The P is genuinely a place-holder in that it adds *nothing* to the inferential role of the necessity claim, in particular, not that there is some sentence of English which would express it. Thus, having arbitrary sentences—i.e. being able to quantify over potentially inexpressible propositions—is simply tantamount to having sentential operators which have just the content of, say, 'it is necessary that' and no extra.

Of particular interest is the ability arbitrary sentences give us to express the content of various conditional locutions. As Brandom has argued, it is these which allow us to bring within the explicit view of the game of giving and asking for reasons the inferential proprieties which give content to that game. We needed objectual nominal quantifiers and conditionals to express the content of predicates and, hence, to give explicit voice to our knowledge of properties. We need objectual propositional quantifiers to express the content of these conditionals, and hence to give explicit voice to our knowledge of good inference.[21]

Notes

[1]See "Asserting" and also *Making It Explicit,* for a fuller treatment. This whole formulation of the problem for the subsententialist is essentially as presented by Brandom.

[2]This, of course, is the line developed by Davidson in, among other articles, "Truth without reference."

[3]Of course, this is not to disagree with Davidson who deploys this picture not so as to rescue the primacy of word meaning over sentential, but rather merely to show a role—a clearly derivative one—for the former, within the project of interpreting the latter.

[4]The notions of commitment and entitlement and their importance for the understanding of the act of asserting are first discussed Brandom's "Asserting." The relation between these notions and entailment is discussed in his "Varieties of Understanding", though the account there does not go too far and is, in some respects, unsatisfactory. A more systematic treatment of language in terms of commitment and entitlement is developed in Brandom's *Making It Explicit.*

I have developed the connections between the two normative assertional dimensions and systems of entailment in much more detail in a series of papers. In "Two concepts of entailment" the fundamental distinction between commitive and permissive entailment is layed out, and the logical structure of each developed in a language containing &, v, and ~. In two papers with Philip Kremer, the structure of nested commitment entailment claims is studied. Much work remains on these important formal issues.

[5]Obviously it is essential not to conflate the grammatical distinction between propositional and nominal quantifiers, on the one hand, with the semantic distinction between objectual and substitutional interpretations of either sort of quantifier, on the other.

[6]Interestingly, Quine went down exactly this road in, among other places, "Existence and Quantification," where his own commitment to the priority of sentential content leads him to trouble about quantification. In that article, Quine notes that all would be well if we could make do with substitutional quantification, thereby assimilating quantification to conjunction. He despairs of this line of thought, however, for just the familiar reasons recited in the present paper.

[7]This claim is hardly plausible. It is true that each rational could be described and that each real can be constructed by way of an appropriate sequence of rationals, but it does not follow from this that each real can be described, that each real is the referent of a possible definite description in some language. To show this would seem to require showing that each such sequence is *definable.*

[8]It is possible to object to each of these examples. Stewart Shapiro pointed out that the claim that no well ordering of the reals is definable in the language of set theory is a claim which is independent of ZFC. This point does not meet the objection, however, for independence is quite a strong enough relation. If the extended substitutional interpretation of the objectual quantifier was correct, it would be a matter of simple logic that such entities are nameable if they exist. This already is absurd.

Similarly we can do away quite easily with a suggestion which is made quite often, namely that we simply let our language include every set and that these sets be seen as names of themselves. In response to this ploy it is clearly enough to insist that we are talking of *natural* languages. One would have to explain what it was to use a well ordering of the reals in a sentence with a certain meaning in order to render this suggestion even coherent.

In the case of our non-mathematical examples, one might (as Brandom has in conversation) suggest that we can describe spatio-temporally distant physical objects by way of position coordinates. We define a coordinate system at the present and use this to define objects at the distant times. Thus, we use such descriptions as "the grain of sand at position $<x_1, \ldots, x_n>$.

The problem here is that there is no guarantee that these descriptions refer. There may be no grain of sand at any given point. (Even supposing that talk of the specific position of a grain of sand makes sense.) This makes a hash, however, of universal quantifications substitutionally construed as has been argued in detail by James Tomberlin, in "Belief, Nominalism, and Quantification."

In any event, as the following sections show, the normative-inferentialist has *no need* to travel such paths. I remind the reader that I come to praise, not to bury, the inferentialist strategy.

[9]At least not in a *mere* story. Some may want to assimilate mathematical discourse to fictional—a project which I take to have limited explanatory utility—but all would recognize that there is an important distinction between our ontological seriousness about numbers and about Sherlock Holmes. If one is bothered by this, simply change the example.

[10]This is not to say that there are no relations between terms and their referents. There are quite a few indeed, and many of them are of some consequence to the semantic content in particular cases. What is denied by the inferentialist is that any such relation is constitutive of the extension of a term. See Brandom's "Reference Explained Away," and my "Reference Without Causation."

[11]This idea of logical concepts as playing the role of allowing for the explicit consideration of what is otherwise implicit in linguistic practice—an idea which will be put to new uses in what follows—first arises in "Varieties of Understanding" and receives a more complete treatment in *Making It Explicit.* O'Leary-Hawthorne and I offer some substantial revisions of Brandom's account in chapter 3 of *The Grammar of Meaning.*

[12]The way to make sense of subsentential term or predicate content in terms of a prior inferential content of sentences, without any prior assumption of subsentential structure even on the level of the symbols, is developed in Brandom's "Singular Terms and Sentential Sign Designs" and again in *Making It Explicit.*

[13]I say this with certain arguments of Van Inwagen and Lycan in mind. (See the papers in the Bibliography.) Both have argued that there is a principled difficulty with understanding substitutional quantification, because we cannot explain what it means in natural language. (The standard truth conditional semantics are rightly taken to be insufficient.)

[14]This resource connects with the observation that a constitutive feature of linguistic competence is linguistic creativity. As Chomsky has observed, we are each capable of forming sentences never before uttered and, more to the present point, of using terms never before occuring in the language. We can do this and all understand them because we have already defended the appropriateness of various inferences involving sentences using them. We do this, without ever having the term in mind, by abstracting from the contingent features of the terms of our present language in a hypothetical reasoning situation.

[15]Though I would not want to make too much of the surface grammatical phenomenon, nor claim that English is uniformly regimented in this way, there does seem to be a rough-and-ready distinction between our uses of 'let' — as in 'let a be F' — and 'suppose' — in 'suppose a is F' — which corresponds to the distinction between those uses of terms requiring justification by existentials and those which serve to introduce a hypothetical context. The latter can, of course, be introduced at will. In particular, in the case of a *reductio* argument, we positively set out to utter a claim Fa which cannot be defended, since our goal is to infer a contradiction from it. My observation is that we do this typically by saying "suppose a is F. Then it follows that . . ." In the midst of hypothetical proof, when introducing a new arbitrary term by way of a predication, however, we are inclined to say "now let b be the integer such that G" or some such. This latter move could be blocked if Gb could be shown to lead to contradiction.

[16]This objection was brought to my attention by Stewart Shapiro.

[17]Nuel Belnap reminded me of this objection after reading an earlier draft of this paper.

[18]From this perspective, one can see many of Dummett's verificationist arguments as attempts to show the illegitimacy of full seperation of predicate and subject content in various contexts. Whether his arguments ought to be seen as convincing when understood this way is a matter best left for another occasion (though the answer 'no' certainly leaps to mind).

[19]Now one might wonder why we wouldn't simply make do with predicates the explicitation of whose content did not require other than ordinary substitutional quantifications. In general, I suspect that there is a kind of systematicity and simplicity which can be brought to the inferential structure of predications within a field by removing the referential commitment from the arbitrary predications associated with quantificational claims in the field.

Some recent work of Ken Manders's is quite relevant to this issue. He discusses the kinds of epistemic benefits gained by moves in mathematics from a smaller to a larger domain, such as the move from real to complex analysis. His discussion can quite usefully be put within the general context of this paper, but the issues would take us rather too far afield from the present discussion.

[20]See Brandom's refinement — in *Making It Explicit* — of the account first offered by Grover, Camp, and Belnap in "A Prosentential Theory of Truth."

[21]Conversations with both Wayne Davis and John O'Leary-Hawthorne helped me develop many of the ideas of this paper from early rough forms. Earlier conversations with Robert Brandom, Joe Camp, and Peter Van Inwagen provided important seeds of ideas devloped here. The final version of the paper benefitted from comments by audiences at the University of Virginia, Virginia Commonwealth University, and especially the conference "Significance in Semantics" at the University of Cincinnati. I also thank a referee at Nous for important helpful suggestions. The whole of §6 is the result of comments by Nuel Belnap on an earlier version of the paper.

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thought about a few years before and layed to one side. I doubt that I would ever have written this paper without having had this conversation.

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