I received an IRGP grant and have been on a teaching leave for the fall 04. The general area of my IRGP research has been quantification theory, specifically on unrestricted quantification and on the relationship between quantification and identity. Here’s a narration of my research adventure.

Typically when we use quantifiers such as ‘each’, ‘any’, ‘every’, ‘anyone’, ‘everyone’ and ‘everything’, we don’t intend to talk about everyone and everything in the universe. After packing the car for a trip, I tell my wife that “Everyone is in the van.” I tacitly intend and my wife understands that the collection of people that I am talking about is restricted to our four children. Obviously, the fact that George W. Bush and some neighbors are missing from the van does not falsify what I assert.

Restricted quantification is useful in preparing for road trips. However, there are contexts in which we want to use quantifiers to say something about everything. For example, unrestricted quantification seems to be used in sciences such as logic and ontology whose truths are widely applicable. For example, Aristotle says that ontology is the most general of sciences. Other branches are more specialized because they restrict their concern to some proper part of reality. It remains for ontology to take everything into account. Its truths (e.g., Everything is self-identical) are fully general and applicable to the domains of the more specialized sciences. Hence, the quantifiers of the language of ontology are unrestricted, i.e. they range over everything. Also, in logic, when I say that it is logically true of everything that it is either material or not, I don’t intend to just speak of things in the immediate neighborhood; here ‘everything’ means everything.

Another sign that unrestricted quantifiers have a place in logic is reflected in the standard parsing of English quantifications. For example, ‘All men are mortal’ is ‘(x) (x is a man → x is mortal)’ which means everything x is such that if x is a man then x is mortal.

Of course, the intention to say something meaningful about everything and it being meaningful to say so are two different things. Are there any logical impediments to unrestricted quantification (and thus objections to the possibility of logic and ontology as conceived above)? Well, yes. In the literature there are roughly two lines of resistance to the possibility of unrestricted quantification.

(1) If the collection of everything serves as a domain of quantification, paradoxes (e.g., Russell’s paradox) result. The collection of everything is just too large to serve as a domain. A domain of quantification can only be a proper part of everything.

(2) Setting aside (1), there is nothing in the thoughts and linguistic practices of quantifier users that determines that the domain of quantification is all-inclusive. In other words: it is always compatible with the thoughts and linguistic practices of quantifier users that the domain be less than all-inclusive. There is no good reason to think that a given use of quantifiers determines that the domain is all-inclusive. What makes quantifier users so confident that they are speaking about everything?

The first line of resistance is Bertrand Russell’s rational for the theory of types. Putnam and Quine have pursued the second line of resistance. Rather than review responses to (1) and (2), I now say something about my path to this issue.

In previous work, I have defended Quine’s account of first-order logical truth with identity by arguing that his account must represent genuine identity in the relevant language as indiscernibility with respect to the predicates of that language; otherwise it is extensionally incorrect, as the critics say.
After completing this work I discovered Quine’s paper criticizing Geach’s thesis that identity is relative. Here Quine asserts that first-order quantification requires the notion of absolute identity. Quine says that if Geach is right, first-order quantification collapses. The question arises: Does this pronouncement, nowhere defended by Quine, conflict with my portrayal of Quine’s account of logical truth? I say that Quine’s account of logical truth requires that the identity relation be represented as indiscernibility (‘$a=b$’ is true in a language L if and only if $a$ and $b$ are indiscernible with respect to the predicates of L). But indiscernibility is not absolute (i.e., strict) identity, a relation each thing bears to itself and to nothing else. I am too junior to start retracting things in print. More importantly, I wonder whether Quine is right to think that quantification requires absolute identity. It is not obvious. The strategy of this semester’s pursuit of answers was as follows.

First, answer questions like (a) and (b).

(a) How are ‘every’, ‘some’, and their like related to ‘the same as’? Is there any ground for saying that an understanding of the former—of expressions of generality—presupposes an understanding of the latter—of expressions of identity?

(b) Suppose that a language is framed within first-order logic without identity: is there then any need to assume an interpretation of the language will involve or invoke a relation of identity over the domain?

Second, assuming that quantification requires identity, inquire into whether or not the needed identity relation is absolute like Quine says or relative like Geach holds.

After thinking about (a) and (b) on and off since September of 03 and seriously since this summer, I’ve concluded that Quine is right: quantification does require a notion of identity.

Skipping lots of important details, quantification is part of a language’s referential apparatus. Reference is only possible against the background of a principle of individuation and criteria of identity. In other words: in order to use a name or the apparatus of quantification to refer to a thing or to a collection of them, there must be a principle that individuates the referents, and there must there be criteria of identity for the things referred to.

For example, consider the sentence “Snow is white”. As Donald Davidson notes, Tarski completely misses the fact that this sentence cannot be understood as

$$(x) \ (\text{Snow}(x) \rightarrow \text{White}(x))$$

which means

*For all things $x$, if $x$ is snow, then $x$ is white.*

There is no principle of individuation for snow, snow is an undifferentiated mass (in contrast to snowballs, snowmen, and snowcones). The predicate *is snow* does not divide its reference because snow is true of stuff and not true of things to which one may refer. Since there is nothing nameable that can complete the schema ___is snow to form a meaningful atomic sentence, the above universal quantification doesn’t make sense.
Consider:

(1) \( \exists x (x \text{ was at McKeon’s house yesterday and } x \text{ is at McKeon’s house today}) \)

This is true just in case

(2) There is some \( x \) such that \( x \) was at McKeon’s house yesterday and \( x \) is at McKeon’s house today.

A compositional semantics requires that the semantic contribution of ‘\( x \)’ be the same in all three occurrences to the truth condition of sentence (2). Since the semantic contribution of ‘\( x \)’ is an object, it follows that in order for the use of ‘\( x \)’ in this sentence to be a successful case of reference the object referred to in the second occurrence of ‘\( x \)’ (under the description of \textit{was at McKeon’s house yesterday}) is the same object referred to by ‘\( x \)’ in its third occurrence (under the description \textit{is at McKeon’s house today}). So, understanding what makes (1) true in terms of (2) appeals to the fact that an object that was at McKeon’s house yesterday is identical with an object that is at McKeon’s house today.

One way of putting what the above two examples illustrate is that quantification, an apparatus of reference, requires that the domain of discourse be individuated and that there be criteria of identity for the individuals. In characterizing the domain of discourse we must rely on a concept which provides a principle of individuation and criteria of identity which, so to speak, carve the domain up at its joints. Following John Locke, such a concept is called a sortal concept.

OK. Quantification requires identity and individuation. What does this have to do with the issue of whether or not unrestricted quantification is possible? Good question. Let me continue the narrative. According to my research strategy, once I concluded that quantification requires identity I had to figure out whether quantification requires \textit{absolute} identity. Here’s what happened.

Quine, like Frege, is a proponent of unrestricted quantification. This is not idiosyncratic; many logicians and philosophers of language believe that unrestricted quantification is permissible. I won’t get deeply into it here, but Quine has got a lot invested in thinking that the apparatus of unrestricted quantification is the sole basis for reference in language. In conjunction with his thesis that there is nothing in the thoughts and linguistic practices of quantifier users that determines that the domain of quantification is all-inclusive (mentioned a couple pages back), we get a rationale for his thesis that reference is inscrutable.

At one point this fall I’m thinking the following. “I’ve got it. If the domain of quantification is everything and there can only be one criterion of identity defined over the elements of a domain, then, of course, the identity relation defined over the domain has to be the \textit{absolute} identity relation. After all, if \( a \) and \( b \) are the same thing, then there can be no predicate true of one and false of the other.” Compare: if \( a \) and \( b \) are the same word-type but different word-tokens, then there can be predicates true of \( a \) and false of \( b \). The sortal \textit{word type} doesn’t generate an absolute identity relation, the concept \textit{thing} does.

I soon realized that this won’t work as a means of grounding Quine’s thesis that quantification requires identity because the concept \textit{thing} is not a sortal concept. To see this, consider that there is no way of counting the number of things in your South Kedzie office. This isn’t because there is such a number beyond our epistemic reach, it’s because it doesn’t make sense to think there is
such a number until the sort(s) of things to be counted has been specified. For example, is your
desk just one thing? What about its top, its legs, the drawers, the drawer handles, the paint, etc.? Aren’t these also things? Aren’t parts of things themselves things? There is no principled way of
answering questions such as these until we are told what sorts of things we should be counting.
In short: when we count we appeal (implicitly or otherwise) to principles of individuation and
identity. Since the concept of a thing generates neither (it is not a sortal), there is no number of
things in the office, on your person, …, or in the universe.

So, thing (even object) is not a sortal concept. Realizing this has forced me to not only question
Quine’s thesis but also the very possibility of unrestricted quantification (this is not the place I
thought I would be when I started this project!). In a nutshell, here’s where I am at (as of 2:29
PM, 11/29/04).

Quantification requires a domain of discourse where each element is individuated and there are
criteria of identity for the individuals of the domain. On my view, this amounts to requiring that
the domain of discourse be characterized (implicitly or otherwise) by a sortal concept. Now, in
order to characterize the unrestricted domain we have to characterize “thing” in the most general
sense of the term… its use according to which the term is applicable to things of many different
kinds. But no sortal concept characterizes “thing” in the most general sense of the term. So,
unrestricted quantification is not possible.

This argument generates a third line of resistance to the possibility of unrestricted quantification
in addition to the two mentioned above on p. 1. I think that there is some significance to this
because I think that (1) (on p. 1) is false and I think that the third line of resistance is easier to see
than (2).