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CONTEMPLATION ON BERG ARGUMENT IN DE RE

Morteza Mezginejad,
Department of Philosophy and theology ,university of Birjand Assistant Professor

Abstract. Burge has provided a description of two concepts of *de re* and *de dicto*. He proves that beliefs "*de re*" are so fundamental that without them the understanding of language and thought would not be possible. Explaining the mathematical propositions is one of the difficulties of his theory. Understanding some mathematical *de dicto* beliefs are such that the *de re* propositions are based on them. In order to get rid of this difficulty, by extending the epistemic meaning of *de re*, he categorizes the purely mathematical beliefs under referential ones in spite of the fact that it seems not to be so. In a critique of Burge’s analysis, Azzouni believes that one can adhere to all premises of Burge argument but deny the main condition of *de re* beliefs, namely having references without committing any contradiction. In this article, we have tried firstly to answer Azzouni’s criticism then we have analyzed Burge’s working procedure. Toward the end, this article has demonstrated that, Burge's perspective about comprehension of arithmetic propositions is not exact.
Keywords: de re, de dicto, Burge, Azzouni, language.

De re/de dicto distinction in Burge’s point of view

In an article entitled "belief *de re*" Tyler Burge has provided a description of two concepts of *de re* and *de dicto*. After criticizing the criteria of Russell and Quine in the distinction between these two concepts, he first brings up a semantic distinction and by generalizing it offers an epistemological distinction of "*de re*"/"*de dicto*". In this article, he proves that firstly, this distinction is fundamental in the field of knowledge; and secondly "de re" beliefs are so fundamental that the understanding of language and thought would not be possible without these beliefs.
Burge puts the semantic distinction of "*de re*"/"*de dicto*" as follows (Burge 2007, p. 68):
" An attitude is de dicto if it is completely conceptualized. An attitude is de re if it has content that is not completely conceptualized(and, it should be added, a not completely conceptualized element in the content succeeds in referring to a re). That is, the content contains a demonstrative or indexical element successfully applied to a re. The application of the demonstrative or indexical element is the element in the content that prevents the content from being completely conceptualized. This element is formalized by a free variable contextually applied. When successful, such applications are to res”.
For example:

1. Ercut believes the proposition that an individual is a spy. (*de dicto* Belief)
2. It is a solitary person that Ercut believes to be a spy. (*de re* Belief)

The proposed distinctions play a central role in Burge's arguments so that some of the criticisms of Burge's arguments are rooted in the way of distinguishing these concepts.

To prove the fundamentality of *de re* beliefs, Burge provides three categories of arguments. The first argument demonstrates that the states of *de re* are necessary for learning the language. This argument has been adapted from the view of Quine (Quine, 1960, p. 35) who considers the learning of language as being based on learning of the occasion sentences. The occasion sentences are ones completely dependent on the text whose truth or falsity changes proportionate to a short period of time:

1. Language Learning is based on learning of the occasion sentences.
2. The meaning of such sentences accompanies the true perceptual beliefs about the surrounding area.
3. Such perceptual beliefs about the surrounding area are the *de re* beliefs.

Therefore, language learning is based on the *de re* beliefs.

Burge's second argument (Burge, 2006, p. 83) proposes a stronger idea about *de re*. In this argument the need for such beliefs is beyond the learning stage and is not limited to language learning, but it will be necessary for having the propositional attitudes. His argument can be rewritten as follows:

a- The usual machines that their programming is linguistically indexical-free, lack the ability to understand or use language.

b- An indexical-free language (for such a machine) is not but the mechanical and merely syntactic application of symbols for the machine and these symbols have not any reference.

c- There is an ability to understand or use the language.

∴ At least in some cases the language must be referential and must be a relationship between symbols and what these symbols indicate (the state of *de re*).

His third and last argument considers the empirical justified beliefs as needed to have a *de re* belief, he regards this argument as a corollary of the second one, because the premises of this argument are based on the conclusion of the second one (Burge, 8, 2006, p. 79):

1. Description or understanding of a sentence or proposition (of a language) requires state of *de re*.
2. Confirming the beliefs implies the understanding and using the propositions and sentences of language.

∴ In so far as they are considered as an empirical knowledge, confirming the empirical beliefs requires the state of *de re* (that is resulted from the test or evidence related to the empirical perceptions).

Finally, adding the latest premise (*): *de dicto* can be transformed into *de re* and using the conclusions of the previous arguments, he concludes that the states of *de dicto* are not necessary for understanding the language. To completing the argument, Burge shows that we cannot transform *de re* into *de dicto*, because in this case the distinction between *de re* and *de dicto* will be useless.

According to the last premise of the argument (*), all propositions can be turned into the state of *de re*; even Burge gives the mathematics or the counterfactuals as the examples which they don't need to *de dicto* state but all of them can be explained by *de re* . But it seems that the ability to transform such propositions doesn't have a competence for negating the necessity of *de dicto* for understanding of language. For example, as to the mathematical propositions, this is a probable assumption that the *de dicto* beliefs are the basic mental beliefs so that the understanding of *de re* beliefs is based on them. Thus, the mere transformation of *de dicto* propositions into *de re* cannot be a reason for this fact that the understanding of mathematical language needs not the state of *de dicto*.

In defense of Burge and in response to this difficulty, the following argument is provided:

1. Understanding of the mathematical beliefs is based also on the understanding and use of the propositions of language and sentences.
2. Due to the first premise of third argument, the description or understanding of a sentence or proposition requires the *de re* state.

Therefore, there will be no proposition at all without the propositions with the state of "*de re*", so that it could be formed a mathematical belief.

Secondly, even if we assume the understanding of some mathematical *de re* beliefs are based on *de dicto* propositions, then according to the conclusion of second argument "the language should be at least sometimes referential and there should be a relationship between symbols and what these indicate." It could be assumed that this is the least which respected in the case of mathematical beliefs; hence we have the understanding of the mathematical sentences.

Burge's defense of fundamentality of de re in understanding of mathematics

Burge in a comment on the *Postscript: De Re Belief*, which was published in 2007, recognizes this problem and supports his opinion about the fundamentality of states of *de re* with a certain theory of understanding of mathematics. Extending the epistemological meaning of *de re*, he categorizes the pure mathematical beliefs as referential ones in spite that it seems to be not so. He offers two epistemological meanings of *de re* (Burge, 2006, p. 69):

1. *De re* is a belief whose content is not conceptualized but has some components that refer to their referents.
2. *De re* is a belief that has an appropriate but "not completely conceptualized" relationship with a referent.

These two epistemological definitions of *de re* are such that the first case includes only the beliefs that have some indexical elements; the second case in spite of including the beliefs with indexical elements comprises some of the beliefs that don't have this characteristic.

When we think about a mathematical proposition in the form of "that-clause" for example “3 + 5 = 8”, the components of this belief lack any indexical elements. Such an expression is conceptualized but it belongs to the second type of beliefs *de re*. Explaining Burge’s point of view is based on the following premises:

a) Relation "not completely conceptualized" is a relation like that of between proper names and their reference, which could be a kind of sociological, historical causality or a psychological relation.

b) The numbers are of two types: simple numbers and complex numbers. The complex numbers are composed of simple numbers. For example, number 547 is composed of simple numbers (5, 4, and 7).

c) There are two kinds of ability to communicate with numbers. The first type is pure computation: computations such as addition, multiplication, subtraction etc. For example, we can apply the different computation methods with ten basic numbers that are base of other numbers. The second type of the ability is the use of numbers for quantification of things; for a group of things we can consider a quantity.

d) The understanding of simple numbers is based on its application[21]; of course, using simple numbers is done immediately, non-inferentially and without calculation[22].

e) Conventional concepts for the larger numbers result from the psychologically small computations and their quick application of simpler numbers and the conventional concepts for the complex numbers are made by the recursive rules from the simpler numbers.

f) According to previous premises, the reference of the simple mathematical beliefs are the natural numbers and such beliefs have the *de re* state.

With these premises, Burge concludes that the simple numbers (1,2,3 ... 9) are not description, but their being is based on the rapid and non-descriptive understanding and their applicability (namely their understanding is based on application). This leads to the relationship of mathematics with its reference. Therefore, mathematical beliefs will be, in fact, based on the *de re* beliefs. So the answer of Burge about the difficulty of mathematics is based on the extension of epistemological meaning of *de re* in his analysis of mathematical beliefs.

Azzouni’s criticism on Burge. In criticizing Burge’s analysis, Azzouni (2008, p. 3) argues: one can adhere to all premises of Burge but deny the main condition of the *de re* beliefs namely having reference without committing any contradiction. What Burge proposed as calculations for the relationship between the mathematical beliefs and their reference, can also be realized without assumption of reference. In other words, the mode of perception that Burge has described, is not based on the use of numbers but on the use of numeral for objects.

For illustrating this difficulty, we assume the referential order of references is changed, with observing their arrangement and numeral such as reference of 1 is number 2, reference of 2 the number 3 and so on. Thus, none of the mathematical abilities that Burge has proposed, disturbs with this change and do not cause any change in their application, even thought it could be assumed that there is no such references.

Analysis and criticism of Azzouni. With regard to Burge’s premises, Azzouni’s criticism is disputable. Epistemologically definitions of *de re,* the reference are a necessary condition in both of them[23]. With regard to the second type of *de re* belief that includes an appropriate but "not completely conceptualized" relationship with a reference, explaining the "not completely conceptualized" relationship according to the premises of (d)[24] and (e)[25] is based on the immediate and undeductive use of simple numbers and simple psychological calculations and quick application for achieving the complicated mathematical concepts. However, this relationship has an important feature that has been ignored by Azzouni i.e. the ignorance of the premises of (d) and (e) representing the relationship between the simple and complex numbers and the recursive calculations from the basic calculations. In the Burge’s expression, the reference of beliefs is changeable, but two points should be considered in this matter. firstly any change in the references should not disrupt the existing order in mathematical beliefs. Secondly, in a calculative system the same references should always be considered for mathematical beliefs. This means that if the reference 1 was considered as 2 and 2 as 3 and so on, in such a system we must always consider the same references for calculations to preserve system’s consistency. Azzouni’s example illustrates these points. In fact, the interpretation of Azzouni can be interpreted as different mathematical systems and paradigms that although they are interchangeable,

[21] The understanding of pure mathematics requires the understanding its application in the arithmetic and numeral. For example, understanding of 3 is dependent upon this perception “there are 3 things”.

[22] The understanding of simple numbers is based on their application. Dummett alludes to this issue: the meaning of mathematical propositions is determined by their application. If two individuals agree completely about the use of an expression, they agree also about its meaning. The reason for this is that the meaning of an expression is exclusively its role as a tool for communication between individuals, like chess pieces that are their role in play according to the rules of the game (Dummett, 1975, p. 241).

[23] *De re* is a belief whose content is not conceptualized but has some components that refer to their referents.
De re is a belief that has an appropriate but "not completely conceptualized" relationship with a referent.

[24] The understanding of simple numbers is based on its application ; of course, using simple numbers is done immediately, non-inferentially and without calculation.

[25] Conventional concepts for the larger numbers result from the psychologically small computations and their quick application of simpler numbers and the conventional concepts for the complex numbers are made by the recursive rules from the simpler numbers.

in this system and paradigm, the reference of a mathematical belief cannot be changed, because the premise of (d) will be unnecessary. Since understanding of simple numbers will not be based on their use (in a paradigm) and it would not lead to a consistent understanding of the numbers by a change of references and it causes the inconsistency of mathematical beliefs.

Criticism of Burge's point of view. Although Azzouni's criticism is invalid, there is another difficulty in Burge's theory of mathematics. Introduction (e)[26] states the formation of complex numbers from simpler one and according to (c)[27] it has been explained how we can reduce all calculations to a few simple Computational operations and numbers by the recursive relations. However, there are some general rules such as "contradiction is absurd" or "everything is identical with itself", the concepts of which are more basic than the numbers and the primitive computational methods. On the other hand, the classical mathematics is based on them. According to Burge's analysis, are these beliefs, *de re or de dicto?*

According to Burge's premises (e) and (c), it might be said 1 = 1 is a *de re* belief – in the second meaning - because 1 is a simple number and the equality can also be considered as a basic calculation. Nevertheless, a question can be pose whether the belief "everything is identical with itself", has been resulted from the particular beliefs such as 1 = 1, 2 = 2, etc. Even if the statement of "every number is identical with itself" can be demonstrated by mathematical induction -and hence it is a *de re* belief- but it can be assumed that, and recursive relations, based on natural numbers epistemologically the belief "every number is identical with itself" is based on a *de dicto* belief like "everything is identical with itself". At least one conclusion is that Burge's mathematical analysis has some presuppositions which are not mentioned. One of the presuppositions is that if the general rules in mathematics are deduced from the simple mathematical beliefs, these general rules are based epistemologically on the *de re* beliefs.

One of the unpleasant conclusions which can be drawn from this presupposition is that if there is a mathematical *de dicto* belief, due to this explanation, it is based on the *de re* beliefs. It should be explained how all the *de dicto* beliefs have been formed by the *de re* beliefs. In other words, how *de re* beliefs have been transformed into *de dicto* beliefs.

Summary. Summarizing the proposed points of view, it can be observed that Burge's view about understanding of arithmetic propositions is disputable; in the field of mathematical beliefs, they cannot simply falsify this probable hypothesis: *de dicto* beliefs are the basic mental beliefs for understanding beliefs *de re*.

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[26] Conventional concepts for the larger numbers result from the psychologically small computations and their quick application of simpler numbers and the conventional concepts for the complex numbers are made by the recursive rules from the simpler numbers.

[27] There are two kinds of ability to communicate with numbers. The first type is pure computation: computations such as addition, multiplication, subtraction etc. The second type of the ability is the use of numbers for quantification of things; for a group of things we can consider a quantity.