

On *De Re* Predicates

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1. Introduction

Definite descriptions occurring in modal contexts, such as attitude reports, are known to give rise to so-called *de re/de dicto* ambiguity.¹ For instance, consider the following attitude report containing a definite description ‘the linguist’.

- (1) John thought that **the linguist** was nervous.

The sentence can mean two different things in the following context.

- (2) CONTEXT: John interviewed two girls, Mary and Sue. He was informed beforehand that one of them is a linguist, but was not told which. We know that Sue is the linguist. After the interviews, John wrongly concluded that Mary was the linguist, because she said she speaks five languages.

With this context in mind, we can read ‘the linguist’ in (1) as referring to Sue or Mary. Thus, the sentence can be paraphrased by either of the two sentences in (3).

- (3) a. John thought that Sue was nervous.
b. John thought that Mary was nervous.

This ambiguity does not obtain without a modal. In the same context (2), ‘the linguist’ in a simple sentence like (4) unambiguously refers to Sue.

- (4) **The linguist** was nervous.

Thus, we conclude that a modal like ‘think’ is a necessary ingredient for *de re/de dicto* ambiguity.

Roughly put, the ambiguity of (1) can be understood as follows. In the interpretation where ‘the linguist’ refers to Sue, it is evaluated against what we know, so the referent of ‘the linguist’ is who we know as the unique linguist, i.e. Sue. This is the same for the unembedded sentence in (4). On the other hand, under the other interpretation, the description is evaluated against what John thinks is true. So the referent of ‘the linguist’ is the person who John thinks is the linguist, i.e. Mary. In this paper, we will call the former reading a *de re* reading, and the latter reading a *de dicto* reading.

It is important to notice that depending on what John believes, the *de re* and *de dicto* readings could in principle be identical. That is, if John correctly knew that Sue was the linguist, ‘the linguist’ would denote Sue under both readings. In such a context, therefore, there is no way for us to know whether the perceived reading is *de re* or *de dicto*. In other words, in order to detect *de re/de dicto* ambiguity of a definite description in a sentence like (1), we need a context where the attitude holder is wrong about the identity of the referent (‘misapprehension context’), as in (2), or a context where the attitude holder

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¹ In this paper I will mostly focus on attitude contexts. See Section 3.3 for *de re/de dicto* ambiguity in non-attitude contexts.

is ignorant about the identity of the referent ('ignorance context'). This is something to bear in mind in investigating *de re/de dicto* ambiguity.

The theoretical discussion of *de re/de dicto* ambiguity has almost always revolved around definite descriptions and other DPs.² In the present paper I will observe that not just DPs, but predicates like 'is Catholic' can also receive *de re* readings (cf. Fodor 1970; Cresswell & von Stechow 1982; Schwager 2011). Percus (2000) observes that predicates cannot give rise to *de re* construals of the sort predicted by some theories of *de re*, namely *de re* readings about the individuals who are known to satisfy the predicates (see also Keshet 2008, 2010). I argue that the *de re* readings of predicates that we observe (or *de re* predicates for short) are distinct from such extensional readings that Percus discusses. Rather, I will claim that *de re* predicates should be understood in terms of the *de dicto* readings of some other predicates whose intensions are contextually equivalent in the sense made clearer below (see Schwager 2011 for a similar idea). Furthermore, I will extend the proposed analysis of *de re* predicates to *de re* readings of all phrases, and show that it provides us with a novel way of understanding the classical data of *de re* DPs.

2. *De Re* Predicates

Firstly, let us look at an example of a *de re* predicate. Consider the sentence in (5) in the context given in (6).

- (5) Mary thinks that Sue is Catholic.
- (6) CONTEXT: Being an ignorant atheist, Mary cannot distinguish different branches of Christianity, and in her mind all Christians are simply Christians, although she knows that there are different groups and that Catholicism is one of them. One day, she heard that our religious friend, John, recently started dating a girl named Sue. Because of his religious orientation, she concluded that John's new girlfriend must belong to the same denomination as him, but she doesn't know which. We know that John is a devout Catholic.

In this context, (5) is judged true. Notice that according to the scenario, what Mary would say is only "Sue belongs to the same denomination as John", and not "Sue is a Catholic." Therefore, under the *de dicto* interpretation of the predicate 'is Catholic', the sentence should be false. This means that the reading that is true in this context must involve a *de re* predicate.

The same point can be made with a different context where the attitude holder has a wrong idea about John's religious belief, for instance (7).

- (7) CONTEXT: (Similar context as above, except that Mary is under the impression that John is a Buddhist, rather than a Catholic). By the same reasoning as above, Mary concluded that Sue believes in the same religion as John.

In this context too, (5) is judged true, despite the fact that Mary would say "Sue is a Buddhist" and not "Sue is a Catholic". This again shows that the predicate 'is Catholic' can be understood *de re*.

As remarked at the beginning, we can only observe *de re* readings of definite descriptions in misapprehension or ignorance contexts, because if the attitude holder knows the correct information regarding the referent, we will not be able to distinguish the *de re* and *de dicto* readings. This applies to *de re* predicates as well. The first context (6) is an ignorance context where Mary does not know if being Catholic is the same as belonging to the same denomination as John, and the second (7) is a misapprehension context where Mary thinks that being Catholic is different from belonging to the same denomination as John. And in a context where Mary knows that John is Catholic, we will not be able to distinguish *de re* and *de dicto* readings of 'is Catholic'. This point will be very important in our account.

Before delving into an analysis of *de re* predicates, it is instructive to understand what *de re* predicates are not. In particular, they should be distinguished from the *de re* readings of predicates that Percus (2000) convincingly claimed are unattested (see also Keshet 2008, 2010). That is, predicates cannot give rise to *de re* readings about their *extensions*. In order to see what this means, let us examine

² I will discuss *de re* readings of quantifiers (and quantificational domains) in Section 3.2.

one of Percus' examples. He points out that the sentence in (8) (uttered by him) is *false* in the context given in (9).

(8) Mary thinks that my brother is Canadian.

(9) CONTEXT: Mary thinks that Pierre, a Canadian, is Percus' brother, and since Percus is American, she concludes that he is American too.

Percus' point is that we cannot have a *de re* reading about the extension of 'is Canadian', i.e. a reading describing Mary's belief about the individuals who are actually Canadians. If this reading were possible, the sentence would be judged true in the given context, as it is paraphrased by (10), which is true in (9) (the subject here is read *de dicto*):

(10) Mary thinks of the real Canadians that the person who she thinks is my brother is one of them.

I find this argument compelling. Thus, predicates simply cannot give rise to *de re* readings about their extensions (in the common ground). However, it should be stressed that this is consistent with the observation we made above. That is, the reading of (5) that is true in the contexts (6) and (7) is not about Mary's belief about the actual Catholic believers. But then, how should we understand the *de re* reading of 'is Catholic' in these situations?

I analyze a *de re* predicate in relation to some other predicate that is in some sense 'the same' from the speaker's perspective (cf. Schwager 2011). Specifically, in both of the contexts (6) and (7), it is commonly known that 'is Catholic' and 'belong to the same denomination as John' are *contextually equivalent*, i.e. they have the same extension, although, Mary does not believe so. I submit that a *de re* reading of 'is Catholic' in such contexts is understood as the *de dicto* reading of 'belong to the same denomination as John'.

To clarify this idea further, let us restate the core aspects of the contexts in more formal terms. I will model the common belief of the discourse participants by a set C of possible worlds, called *Context Set* (Stalnaker, 1978). The intension of expression E is denoted by $\llbracket E \rrbracket$ and its extension in world w by $\llbracket E \rrbracket^w$, i.e. $\llbracket E \rrbracket^w := \llbracket E \rrbracket(w)$. The set of Mary's belief worlds in world w is written $\mathbf{Dox}_w(m)$. According to the contexts (6) and (7), the following two propositions are true:

- (11) a. For all $w \in C$, $\llbracket \text{is Catholic} \rrbracket^w = \llbracket \text{belongs to the same denomination as John} \rrbracket^w$.
(We know that these two predicates are contextually equivalent)
- b. For all $w \in C$, there is $w' \in \mathbf{Dox}_w(m)$ where
 $\llbracket \text{is Catholic} \rrbracket^{w'} \neq \llbracket \text{belongs to the same denomination as John} \rrbracket^{w'}$.
(Mary doesn't know that they are equivalent)

I analyze the *de re* reading of 'is Catholic' as the *de dicto* reading of the contextually equivalent predicate 'belongs to the same denomination as John'. Thus, the meaning of the whole sentence is paraphrased by the *de dicto* reading of (12).

(12) Mary thinks that Sue belongs to the same denomination as John.

The *de dicto* reading of this sentence is certainly true in both contexts.

To reiterate the main point, according to the present analysis, the *de re* reading of a predicate reduces to the *de dicto* reading of some contextually equivalent predicate. Importantly, the predicted reading is not about the extension of the predicate 'is Catholic' in C , which is generally unattested for predicates, as Percus points out. Notice also the role of the second clause (11-b) that for Mary, the two predicates 'is Catholic' and 'belongs to the same denomination as John' are not equivalent. If Mary knew they were equivalent, we would not be able to know whether the perceived reading is *de re* or *de dicto*, as already remarked above.

Now, let us reconsider Percus' example (8) in light of this analysis. We saw that it is unambiguously false in the context given in (9), but why is this so? Notice that by adding some more information, we can actually make the sentence true (cf. Schwager 2011). For example, suppose that Mary wrongly assumes that North Americans are all Canadians, and so Americans are a sub-kind of Canadian (which is a misapprehension context). Then, there is a reading of the sentence that is true in this scenario,

namely the *de dicto* reading. The question is, why is such an interpretation unavailable in the original context (9)? Or in other words, why can we not ‘accommodate’ an additional assumption about Mary’s misapprehension and make the sentence true? I submit that this is due to the following principle that bans free accommodation of wrong beliefs (cf. Sharvit 1998; see also Karttunen 1974; Heim 1992 for a similar principle used for presuppositions triggered in attitude contexts):

(13) *Default Assumption*

Unless mentioned otherwise, assume that the attitude holder shares beliefs with the conversational participants.

In Percus’ context (9), it is not explicitly mentioned what Mary believes about the *intension* of ‘is Canadian’. All it mentions is that Mary has a wrong belief about its *extension*, i.e. for her Pierre is not in the extension, while for us he is. Given that this is all the context says, the Default Assumption requires us to assume that Mary knows that ‘is Canadian’ is distinct from ‘is American’. As a consequence, the sentence is judged *false* (in all possible readings).

To sum up, I propose that the *de re* reading of a predicate P amounts to the *de dicto* reading of a different predicate Q that is contextually equivalent to P , and in order to detect *de re* predicates, misapprehension or ignorance contexts are necessary where the attitude holder is not aware of the equivalence of P and Q , because the Default Assumption would otherwise make the *de re* and *de dicto* readings identical. To put this in slightly different terms, in interpreting a predicate P , we can freely substitute a contextually equivalent predicate Q for it and interpret Q *de dicto*. Thanks to the Default Assumption, however, this is truth-conditionally innocuous, unless we are in a misapprehension or ignorance context. This is the core idea of the theory of *de re/de dicto* ambiguity put forward in the paper. In what follows, I will claim that we can analyze *de re* readings of all expressions, including definite descriptions and quantifiers, in the same manner.

3. Generalized *De Re*

For the sake of clarity, I will first be more explicit about the underlying semantic system. According to the present analysis, a *de re* reading of a predicate reduces to a *de dicto* reading of a contextually equivalent predicate. This allows us to adopt a very simple compositional semantics, e.g. the intensional semantics of Heim & Kratzer (1998), which derives *de dicto* readings for free. The key mechanism is the rule of *Intensional Functional Application* defined as follows. Recall that for any expression E , $\llbracket E \rrbracket$ is its intension and $\llbracket E \rrbracket^w$ is its extension in w , i.e. $\llbracket E \rrbracket^w = \llbracket E \rrbracket(w)$.

(14) *Intensional Functional Application*

If α has β and γ as its daughters such that $\llbracket \gamma \rrbracket \in \mathbf{dom}(\llbracket \beta \rrbracket^w)$, then $\llbracket \alpha \rrbracket^w = \llbracket \beta \rrbracket^w(\llbracket \gamma \rrbracket)$.

This rule is triggered by intensional operators like *think* (the details of the lexical semantics do not concern us here much).

$$(15) \quad \llbracket \mathbf{think} \rrbracket^w = \lambda p_{\langle s, t \rangle} . \lambda x_e . \forall w' \in \mathbf{Dox}_w(x) [p(w') = 1]$$

Other phrases are interpreted extensionally via *Extensional Functional Application*.

(16) *Extensional Functional Application*

If α has β and γ as its daughters such that $\llbracket \gamma \rrbracket^w \in \mathbf{dom}(\llbracket \beta \rrbracket^w)$, then $\llbracket \alpha \rrbracket^w = \llbracket \beta \rrbracket^w(\llbracket \gamma \rrbracket^w)$.

$$(17) \quad \begin{array}{ll} \text{a. } \llbracket \mathbf{Mary} \rrbracket^w = m & \text{c. } \llbracket \mathbf{linguist} \rrbracket^w = \lambda x_e . x \text{ is a linguist in } w \\ \text{b. } \llbracket \mathbf{the} \rrbracket^w = \lambda P_{\langle e, t \rangle} . \iota x [P(x)] & \text{d. } \llbracket \mathbf{smiled} \rrbracket^w = \lambda x_e . x \text{ smiled in } w \end{array}$$

According to this system, $\llbracket \mathbf{Mary\ thinks\ the\ linguist\ smiled} \rrbracket^w = 1$ just in case for all $w' \in \mathbf{Dox}_w(m)$, $\llbracket \mathbf{the\ linguist\ smile} \rrbracket^w = 1$, i.e. in Mary’s belief worlds w' , the unique linguist in w' smiled in w' . This is a *de dicto* reading.

In order to derive a *de re* reading, we need an additional mechanism. According to the analysis of *de re* predicates I proposed in the previous section, a *de re* predicate P can be replaced with a contextually equivalent predicate Q , which we can simply interpret *de dicto* by the above mechanism. To achieve

this, I postulate the following rule (I define it in general terms so that it can apply to phrases other than predicates).

(18) *De Re Rule*

If there is a function ξ of type $\langle s, \tau \rangle$ that is contextually equivalent to $\llbracket E \rrbracket$, then $\llbracket E \rrbracket$ can optionally be interpreted as ξ .

ξ here is the intension of some expression that is contextually equivalent to E .

For an illustration, let us analyze (5) uttered in the context in (6). In this context, we know that $[\lambda w. \lambda x. x \text{ and John belong to the same denomination in } w]$ (call this function ξ) is contextually equivalent to $\llbracket \text{is Catholic} \rrbracket$, i.e. for all $w \in C$, $\llbracket \text{is Catholic} \rrbracket^w$ is the set of people who belong to the same denomination as John in w . Thus, the reading of (19) with a *de re* predicate amounts to (20) understood *de dicto* all the way.

- (19) a. Mary thinks that Sue is Catholic.
b. Mary thinks that Sue belongs to the same denomination as John.

According to the Default Assumption, Mary should also know the equivalence of the two predicates, but in the ignorance context (6), this is explicitly denied, i.e. for all $w \in C$, there is $w' \in \mathbf{Dox}_w(m)$ where $\xi(w') \neq \llbracket \text{is Catholic} \rrbracket^{w'}$. As a consequence, (19-a) with a *de re* predicate becomes truth-conditionally distinct from the *de dicto* reading of (19-b). As remarked in the previous section, without a context like (6) or (7), the Default Assumption renders the *de re* reading of (19-a) and the *de dicto* reading of (19-b) truth-conditionally identical. Also, in principle, nothing prevents the *De Re Rule* from applying to phrases in non-modal contexts, but such cases are bound to be truth-conditionally indistinguishable from readings derived without the *De Re Rule*.

In what follows, we will extend the above analysis of *de re* predicates to *de re* readings of other phrases. But before proceeding, I will mention one problem which Schwager (2011) already gives a nice solution to. The problem has to do with the fact that a *de re* predicate can have an empty extension in the Context Set. For instance, consider the sentence (20) in the context given in (21).

(20) Mary thinks that John is 123 years old.

(21) CONTEXT: According to Mary, John is the oldest person ever lived. But she doesn't know how old John actually is. Nor does she know that the oldest person in the history actually died at the age of 122.

In this context, the sentence is judged true. Since the *de dicto* reading of 'is 123 years old' will make the sentence, the true reading involves a *de re* predicate. However, we know that this predicate has an empty extension in all of the worlds in the Context Set. Therefore, the *De Re* rule allows (20) to be synonymous with the *de dicto* reading of (22) (on the assumption that we agree that there are no unicorns), which is obviously wrong.

(22) Mary thinks that John is a unicorn.

Schwager (2011) already notices this problem and offers a solution, which we adopt here. The essence of her proposal is to loosen the notion of contextual equivalence somewhat, using maximally similar worlds where the functions have some extensions.

(23) ξ and ζ are **contextually equivalent** in C , if for all $w \in C$ and for all w' that is maximally similar to w such that $\xi(w') \neq \emptyset$ and $\zeta(w') \neq \emptyset$, $\xi(w') = \zeta(w')$.

If ξ and ζ have extensions in worlds $w \in C$, the relevant maximally similar worlds w' will be identical to w , so ξ and ζ are contextually equivalent just in case they are co-extensive in each world in C . By contrast, for predicates like 'is 123 years old' and 'is a unicorn' that have empty extensions, we check their equivalence in worlds where they do have non-empty extensions but with other respects everything is the same as what we commonly believe. According to this definition of contextual equivalence, 'is 123 years old' and 'is unicorn' are not contextually equivalent in normal situations.

3.1. De Re Definite Descriptions

I will now demonstrate that the above analysis accounts for *de re* readings of definite descriptions without further ado. Let us take the example that we started out with, repeated in (24).

(24) John thought that the linguist was nervous.

According to the context given in (2), for all worlds w in C , $\llbracket \text{the linguist} \rrbracket^w = \text{Sue}$, and but for John's belief worlds w' , $\llbracket \text{the linguist} \rrbracket^{w'}$ is not Sue but Mary. Now, take the function $\xi = [\lambda w. s]$ (where s is Sue). Because it is commonly known that ξ and $\llbracket \text{the linguist} \rrbracket$ are contextually equivalent, the analysis predicts that the sentence (24) with 'the linguist' being *de re* can mean the same thing as 'John thinks that Sue was nervous'. This is a desired outcome.

There is, however, an interesting difference between *de re* definite descriptions and *de re* predicates: definite descriptions readily admit *de re* readings in out-of-the-blue contexts. For instance, consider (25).

(25) John thinks that the winner lost.

This sentence has a coherent reading, where 'the winner' is read *de re*, but in order to access this reading, we do not need an elaborate context specifying what John thinks about the winner. Rather, we can easily find a true reading of (25) which suggests that John wrongly thinks that the actual winner is a loser. On the other hand, it is almost impossible to read 'lost' *de re* out of the blue. That is, it is impossible to infer from (25) that John has some wrong idea about losing, and the person who he thinks won has some property that is contextually equivalent to 'lost'. Thus, there is an asymmetry between *de re* definite descriptions and *de re* predicates regarding how easy it is to access their *de re* interpretations.

I claim that this difference between definite descriptions and predicates is pragmatic in nature. In order to account for it, I stipulate the following exception to the Default Assumption:³

(26) *Exception to the Default Assumption*

Even if it is commonly known that $\llbracket E \rrbracket$ of type $\langle s, e \rangle$ is contextually equivalent with a rigid designator ξ of type $\langle s, e \rangle$, it is not required to assume that the attitude holder knows the equivalence.⁴

To illustrate, let us analyze (25) in an out-of-the-blue context. The *de re* reading of the subject 'the winner' presupposes that there's a unique winner. When the sentence is uttered out of the blue, this needs to be accommodated.⁵ We call this individual a . It also needs to be accommodated that John knows a in some form ξ , because he holds some belief about a . In order for the sentence to be consistent with the context, it needs to be the case that in John's belief worlds w' , $\xi(w')$ can be a loser in w' , while at the same time, in all $w \in C$, $\xi(w) = a$. What would such ξ be? Notice that the rigid designator $[\lambda w. a]$ will do. So what (25) means is: John thinks that a lost.

To support this view, we observe that a *de re* reading of a name, which denotes a rigid designator itself, requires contextual support as much as a *de re* predicate does. For instance, the following sentence, originally due to Quine (1956), sounds infelicitous out of the blue, as it ascribes Ralph a contradictory belief (Maier 2009).

(27) #Ralph thinks that Orcutt is a spy and he also thinks that Orcutt is not a spy.

In order for Ralph to have a consistent belief, we need a context that enables a *de re* reading of the name 'Orcutt', namely, a context where there is at least one function ξ of type $\langle s, e \rangle$ that is contextually equivalent to $\llbracket \text{Orcutt} \rrbracket = [\lambda w. o]$ (where o is Orcutt), but Ralph doesn't know this equivalence. For example, the following context, also originally due to Quine (1956), contains two such functions.

³ ξ is a **rigid designator** if for all possible worlds w and w' , $\llbracket \xi \rrbracket^w = \llbracket \xi \rrbracket^{w'}$

⁴ It is part of our stipulation that contextual equivalence with rigid designators of type $\langle s, \langle e, t \rangle \rangle$ (or any other type distinct from $\langle s, e \rangle$) is not easy to accommodate. If it were, we would derive Percus' unwanted readings. For instance, suppose that we know that the set of actual Canadians is S . Then, using the rigid designator $[\lambda w. \lambda x. x \in S]$, we would predict the impossible reading for (8) in (9).

⁵ This step is actually not at all trivial, but we will ignore the complications here. See Sharvit (1998) for discussion.

- (28) Ralph saw Ortcutt in a gray coat one day and thought he was a spy. On the next day, he saw him again on the beach without realizing that it's the same guy that he saw the day before, and thought he wasn't a spy.
- $\xi_1 = \lambda w$. the man Ralph saw in a gray coat in w
 - $\xi_2 = \lambda w$. the man Ralph saw on the beach in w

Both ξ_1 and ξ_2 are contextually equivalent to $\llbracket \text{Ortcutt} \rrbracket$. Then, using these functions in place of the name 'Ortcutt', we can make the sentence true. That is, the analysis predicts that there is a reading synonymous with the *de dicto* reading of (29).

- (29) Ralph thinks that the man he saw in a gray coat is a spy, and he also thinks that the man he saw on the beach is not a spy.

This sentence does not ascribe Ralph an incoherent thought, as desired. Crucially, such an interpretation is extremely hard to obtain for (27) without a context like (28).

3.2. De Re Quantifiers

Let us now turn to quantifiers. It is widely observed that quantifiers also give rise to *de re* readings, but the readings discussed in previous studies are *de re* readings about the *extension* of the restrictor predicate. For example, consider (30).

- (30) Mary thinks that all Americans are Canadians.

Out of the blue, (30) does not sound incoherent. Rather, it means that Mary believes of the people who we know as Americans that all of them are Canadians. Thus, it is the *extension* of the restrictor 'Americans' in the Context Set C that is interpreted *de re*.

Now recall Percus' point: it is impossible to read 'are Canadians' *de re* in the same way. Thus, (30) cannot mean what (31) means:

- (31) Mary thinks of the actual Canadians that some of them are Americans and nobody else is an American.

This is quite puzzling. On the assumption that both 'Americans' and 'are Canadians' are predicates of individuals, there seems to be no semantic reason why the reading available for the former is not available for the latter.⁶

I analyze this asymmetry between the restrictor and nuclear scope with an auxiliary assumption about quantifiers like *all*. Following Matthewson (2001) among others, I assume that the first argument of *all* is a plural individual, while the second argument is a predicate ($'x \sqsubseteq_a X'$ means ' x is an atomic part of X ').

- (32) $\llbracket \text{all} \rrbracket^w = \lambda X. \lambda P_{\langle e, t \rangle}. \text{for all } x \sqsubseteq_a X, P(x) = 1$.

I also assume that the sentence (31) contains a syntactic node that denotes the plurality of individuals that satisfy the predicate 'Americans'. Then, the reading of the sentence we are after is derived by applying the *De Re* Rule to that node, using $[\lambda w. A]$ (where A is the set of all actual Americans), which a rigid designator of type $\langle s, e \rangle$. This can be accommodated as rigid designators of type $\langle s, e \rangle$ are exceptions to the Default Assumption. On the other hand, the predicate 'are Canadians' can never give rise to a similar reading about its extension, as already explained above, which explains why (31) is not a possible reading of the sentence. Thus, this analysis accounts for the asymmetry between the restrictor and nuclear scope of a quantifier by their structural and semantic differences.⁷

⁶ Percus (2000) essentially stipulates that NP and VP behave differently in this way, without explaining why.

⁷ One attractive feature of this analysis is that it nicely accounts for the observation made by Musan (1995) and Keshet (2008, 2010) that so-called weak quantifiers, unlike strong quantifiers like *all*, do not give rise to extensional *de re* readings of the restrictor. Assuming that weak and strong quantifiers differ in the structure, i.e. the restrictor of a weak quantifier is not an individual but a predicate, the weak vs. strong difference naturally falls out. Incidentally, in appropriate contexts, the restrictor argument of a weak quantifier does give rise to a reading analogous to *de re* predicates, as observed by Schwager (2011).

Before moving on, I would like to point out that there is a *de re* reading of the entire quantifier as well, although such a reading is hard to get without an appropriate context, just like *de re* predicates are. Here is an example.

(33) Mary thinks that Peter won every round.

(34) CONTEXT: Peter and Dave competed in a game. They played it for 10 rounds in total, but we don't know the outcomes. Mary watched them play until Round 7 and left, thinking the match would continue until Round 15. Because Peter won all the rounds while she was watching, she thought he would continue to win at least 3 more rounds, but probably would not win all 15 rounds. We are wondering who won how many times.

In this context, the sentence has a true reading. However, since Mary doubts that Peter won all the 30 rounds, the *de dicto* reading of (33) is false. Thus, the true reading should involve a *de re* reading of the quantifier 'every round'. Notice that this is predicted by our account: it is commonly known that 'every round' is contextually equivalent to '10 rounds' in (34), and the *de dicto* reading of (35) is true in the above context.

(35) Mary thinks that Peter won 10 rounds.

3.3. De Re Readings in Non-Attitude Contexts

Lastly, let us discuss *de re* readings in non-attitude modal contexts. It is well known that *de re/de dicto* ambiguity arises in such environments as well, as illustrated by the conditional sentence in (36).

(36) If the winner lost, John would have been very sad.

This sentence has a felicitous reading, which involves a *de re* reading of 'the winner'. The intuitive paraphrase of the sentence is 'for the individual we know as the winner, if he lost, John would have been very sad'.

Our the *De Re* rule explains this reading in an out-of-the-blue context. Just as in the case of (25) above, we first accommodate that we know who the winner is. Call him *a*. Then, with the rigid designator $[\lambda w. a]$, we predict that the sentence is synonymous with (37) (where *a* is the name denoting the rigid designator $[\lambda w. a]$), which captures the perceived reading of (36).

(37) If *a* lost, John would have been very sad.

It is interesting to note that in non-attitude modal contexts such as *if*-conditionals, *de re* definite descriptions can easily be found, but *de re* predicates are hard to spot. For instance, (36) seems to lack a reading paraphrasable with a *de dicto* reading of a predicate that is contextually equivalent to 'lost'. The same holds for the following examples.

- (38) a. The rules require the American man to become Canadian.
b. The picture indicated that the winner lost.

The asymmetry between *de re* descriptions vs. *de re* predicates can be explained by the Default Assumption and type $\langle s, e \rangle$ exceptions to it. That is, in order to detect truth-conditionally distinct *de re* predicates, we need a context where it is known that in the worlds in the modal base, the relevant contextual equivalence does not hold, just as we needed misapprehension or ignorance contexts with attitude reports. However, such contexts are simply not easy to construct with non-attitude modals. On the other hand, contextual non-equivalence with rigid designators of type $\langle s, e \rangle$ is an exception to the Default Assumption, and can readily be accommodated. As a result, *de re* definite descriptions are more rampant in non-attitude modal contexts.

Incidentally, the restrictor of a strong quantifier can easily give rise to a *de re* reading of its extension, as demonstrated by (39).

(39) If all Americans were Canadian, the world would be peaceful.

This is in line with the analysis of (strong) quantifiers proposed above that the restrictor argument of *all* denotes a plural individual.

4. Conclusions and Further Prospects

To conclude, the main observation made in this paper is that predicates can receive *de re* readings too. I claimed that their *de re* readings are distinct from the extensional readings that Percus discusses, and that they should be understood as *de dicto* readings of contextually equivalent phrases. The resulting theory is very similar in spirit to Schwager's (2011) analysis of *de re* predicates (in weak quantifiers), but it was demonstrated that the idea generalizes to all phrases: a *de re* reading of any phrase can be understood as a *de dicto* reading of some contextually equivalent phrase. I also made explicit the role of context in the present phenomenon, and proposed that rigid designators of type $\langle s, e \rangle$ have an exceptional pragmatic status.

It also should be noted that the notion of contextual equivalence is closely related to, but more general than the notion of *acquaintance relation* that is widely employed in analyses of *de re* DPs in attitude reports (Kaplan, 1968; Lewis, 1979; Cresswell & von Stechow, 1982; Percus & Sauerland, 2003). Especially, our theory of contextual equivalence is applicable to *de re* readings of non-attitude modals, for which theories based on acquaintance relations need a separate treatment. Due to the limited space, more detailed comparisons with existing theories of *de re* need to be deferred to another occasion.

In the remainder of the paper, I will address two further problems. One problem has to do with more complex sentences with multiple embeddings, for example, (40).

(40) Bill doubts that John thinks that the linguist was nervous.

In the context given in (2), the definite description 'the linguist' in the most embedded clause can be interpreted as Mary (*de dicto*) or Sue (*de re*), just as before. However, there is also a reading where 'the linguist' is evaluated relative to what Bill believes. In order to single out this reading, let us consider the following context.

(41) CONTEXT: John interviewed two girls, Mary and Sue. He was informed beforehand that one of them is a linguist, but was not told which. We don't know which girl is the linguist either, but we know Bill thinks that it is Sue.

In this context, (40) has the same reading as (42).

(42) Bill doubts that John thinks that Sue was nervous.

In order to account for this reading, we need to allow the *De Re* rule to be relative to Bill's belief worlds, instead of the Context Set. This pattern seems reminiscent to how presuppositions behave in modal contexts: presuppositions triggered in matrix contexts are evaluated against the Context Set, while those triggered under 'Bill doubts that' are evaluated against Bill's belief worlds. I think this idea is worth pursuing (cf. Maier 2009), but a technical implementation is left for another occasion.

Related to this is the issue of *de re* readings in counterfactual attitude reports (Percus & Sauerland, 2003; Yanovich, 2011; Ninan, 2012). Here is an interesting contrast noted by Percus & Sauerland (2003:fn.19). First, as a baseline, (43) is true in the context in (44).

(43) John thought that Mary was a bald man in his 90s.

(44) CONTEXT: Mary anonymously reviewed John's paper (unknown to John). John thought that his article had been reviewed by a bald man in his 90s.

This is predicted by our theory, as the *De Re* rule allows us to substitute 'the reviewer of John's article' for 'Mary' in this context. However, when the predicate is changed from 'think' to 'dream', the sentence can no longer have a true reading, as indicated by # in (45).

(45) #John dreamed that Mary was a bald man in his 90s.

(46) CONTEXT: Mary anonymously reviewed John's paper (unknown to John). John had a dream that his article had been reviewed by a bald man in his 90's.

At first blush, this might seem unexpected under our account. That is, if the *De Re* Rule is simply based on the contextual equivalence between ‘Mary’ and ‘the reviewer of John’s article’, we should be able to get true readings for both sentences, i.e. the *de dicto* readings of the following sentences. However, this is not the case.

Interestingly, this problem is closely related to the previous one. Yanovich (2011) suggests that counterfactual attitudes are actually double-modals: counterfactual worlds like dream worlds are in some sense derived from the attitude holder’s belief worlds. Thus, a counterfactual attitude predicate like ‘dream’ can be thought of as involving two modals, one being ‘believe’ and the other one embedded under it. Now recall the previous problem. We saw that the *De Re* Rule in a double embedding situation like (40) can be evaluated against the attitude holder’s belief worlds, rather than the Context Set. Then, if ‘dream’ is semantically a double modal, then we expect a *de re* reading relative to the attitude holder’s belief worlds to be possible. This indeed is the case, as Yanovich (2011) observes. For instance, ‘the reviewer of his paper’ can be read as denoting Jane in the context given in (48).

(47) John dreamed that the reviewer of his paper did not review his paper.

(48) CONTEXT: John is under the impression that Jane reviewed his paper. We know that it was actually Mary who reviewed it.

In this context, the equivalence between the definite description in question and $[\lambda w. j]$ (where j is Jane) holds in John’s belief worlds, and the desired *de re* reading is derived. On the other hand, in the case of (45) above, the *de re* reading relative to John’s belief worlds cannot be derived with $[\lambda w. m]$, since the equivalence does not hold in John’s belief worlds. However, notice that in order to explain the inadequacy of (45), we also need to *block* the *de re* reading relative to the Context Set. This problem is left for future research.

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