The Problem of *De Re* Modality

Mircea Dumitru

Faculty of Philosophy

University of Bucharest

Two parts

(I) Some notions from the ongoing debate in philosophy of modality surrounding the *de dicto* – *de re* distinction.

(II) Semantic underpinnings of the same distinction

(1) $\Box(\forall x)Mx$
(2) $(\forall x)\Box Mx$
(3) $\Box(\forall x)Mx$
(4) $(\forall x)\Box Mx$
(5) "$(\forall x)Mx$" is a necessary truth
(6) For every x, "Mx" is a necessary truth

(i)Quine – modal notions are lacking in sense. There is no intelligible distinction to be drawn between what is necessarily and what is contingently the case or between an object's essential and accidental features.

(ii)David Lewis – the possible and the actual are on an ontological par

Quine had two arguments against the intelligibility of *de re* modality: one broadly metaphysical and the other broadly logical in character.

The metaphysical argument: one cannot make sense of an object's necessarily being a certain way independently of how it is described.

The logical argument: four steps

(1)From failure of substitution to the irreferentiality of the term;

(2) From the irreferentiality of the term to the irreferentiality of the variable;

(3) From the irreferentiality of the variable to the breakdown in objectual satisfaction;

(4) From the breakdown in objectual satisfaction to the unintelligibility of quantification into modal contexts.

Critical question – whether the steps go through in the modal case. They do not.

Quine's arguments rest upon certain background assumptions in metaphysics and philosophical logic: (a) an empiricist criterion of intelligibility under which essence must have its source in meaning; (b) a naïve view of singular terms under which no significant distinction is to be drawn between the use of names and descriptions.

II The semantics of the distinction

(7) $\Box(\forall x)Mx$

(8) $(\forall x)\Box Mx$

(9) "$(\forall x)Mx$" is a necessary truth

(10) For every x, "Mx" is a necessary truth

(11) A sentence σ of LFOML is de dicto iff (1) σ contains no occurrence of an individual constant within the scope of a modal operator; and (2) any occurrence in σ of a variable within the scope of a modal operator is bound by a quantifier also within the scope of that operator. A sentence of LFOML is de re iff it is not de dicto.

(12) $\Box(\forall x)(Fx \rightarrow Gx)$ – De dicto

(13) $\Box(\forall x)(Fx \rightarrow \Diamond Gx)$ – De re

(14) $\Box Fa$

(15) $(\exists x)(Fx \ \& \ \Diamond \sim Fx)$

(16) Example 1

W*	u	v
$\{\alpha,\beta\}$	$\{\beta,\gamma\}$	$\{\alpha,\gamma\}$
F: $\{\alpha,\beta\}$	F: $\{\alpha,\beta,\gamma\}$	F: $\{\alpha, \gamma\}$
G: $\{\alpha\}$	G: $\{\gamma\}$	G: $\{\alpha,\beta\}$

De Dicto sentences which are true in *I*

(17) $\Box(\exists x)Fx$

(18) $\Box(\exists x)Gx$

(19) $\Box(\forall x)(Gx \rightarrow Fx)$

De Re sentences which are true in *I*

(20) ◊~Ea

(21) □(∀x)◊~Ex

(22) (∃x)(Gx & ◊~Gx)

(23) □(∃x)◊~Gx

(24) (∃x)□Fx

Define the *inner extension* of an *n*-place predicate λ at a world *w*, *w*[[λ]], to be the collection of *n*-tuples ($a_1 \ldots a_n$) in *w*[λ] such that each a_i exists at *w*.

Then two worlds *u* and *u*′ are said to be *qualitative duplicates* iff (i) *u*(*D*) and *u*′(*D*′) have the same number of elements, and (ii) there is a way of correlating each element of *u*(*D*) with a unique element of *u*′(*D*′) so that each element of *u*′(*D*′) has exactly one element of *u*(*D*) correlated with it, such that (a) *u* and *u*′ assign the same truth-values to sentence-letters , and (b) for any predicate λ, *u*′[λ] is the set obtained by substituting correlated objects in *u*[[λ]]; that is the *entire* extension of λ at *u*′ is obtained from the *inner* extension of λ at *u*.

Example 2

We set up an arbitrary correlation between {β,λ} and {ε,φ}, say $\beta \Leftrightarrow \varepsilon$, and $\gamma \Leftrightarrow \varphi$.

Correlation	*u*	*u*′
$\alpha \Leftrightarrow \delta$		
$\beta \Leftrightarrow \varepsilon$	{β,γ}	{ε,φ}
$\gamma \Leftrightarrow \varphi$	F: {α,β,γ}	F: {ε,φ}
	G: {γ}	G: {φ}

Example 3

Correlation	*v*	*v*′
$\alpha \Leftrightarrow \gamma$	{α,γ}	{γ,ω}
$\beta \Leftrightarrow \varphi$	F: {α,γ}	F: {γ,ω}
$\gamma \Leftrightarrow \omega$	G: {α,β}	G: {γ}

The main definition

If *I* is an interpretation for LFOML (without individual constants), then we say that an interpretation *J* is a *Fine-weakening* of *I* iff *I* and *J* have the same actual world *w** and the non-actual worlds of *I* and *J* can be correlated so that each non-actual world in either interpretation is matched with a qualitative duplicate in the other.

Example 4

The interpretation *J* is a Fine-weakening of the interpretation in Example 1.

w*	u′	v′
{α,β}	{ε,φ}	{γ,ω}
F: {α,β}	F: {ε,φ}	F: {γ,ω}
G: {α}	G: {φ}	G: {γ}

(25) $(\forall x)\Box(x = x)$

A sentence σ of LFOML (without individual constants) is implicitly *de dicto* iff for any two interpretations *I* and *J* such that *J* is a Fine-weakening of *I*, the truth-value of σ in *I* is the same as its truth-value in *J*.

A sentence σ is *essentially de re* (i. e. not equivalent to any *de dicto* sentence) iff there are two interpretations *I* and *J*, *J* a Fine-weakening of *I*, such that the truth-value of σ in *I* is the opposite of its truth-value in *J*.